BIRGER NARBY

FACTORS SHAPING DEMAND FOR PROSTHETIC DENTISTRY TREATMENT WITH SPECIAL FOCUS ON IMPLANT DENTISTRY

ISBN/ISSN 978-91-7104-415-0 / 0348-6672
FACTORS SHAPING DEMAND FOR PROSTHETIC DENTISTRY TREATMENT WITH SPECIAL FOCUS ON IMPLANT DENTISTRY
BIRGER NARBY

FACTORS SHAPING DEMAND FOR PROSTHETIC DENTISTRY TREATMENT WITH SPECIAL FOCUS ON IMPLANT DENTISTRY

Malmö University, 2011
Department of Oral Public Health and
Department of Prosthetic Dentistry
Faculty of Odontology
This publication is also available at:
www.mah.se/muep
To my wife and to my children
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREFACE</td>
<td>9</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>10</td>
</tr>
<tr>
<td>POPULÄRVETENSKAPLIG SAMMANFATTNING</td>
<td>12</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>15</td>
</tr>
<tr>
<td>AIMS</td>
<td>17</td>
</tr>
<tr>
<td>MATERIALS AND METHODS</td>
<td>19</td>
</tr>
<tr>
<td>RESULTS</td>
<td>26</td>
</tr>
<tr>
<td>Study I</td>
<td>26</td>
</tr>
<tr>
<td>Study II</td>
<td>29</td>
</tr>
<tr>
<td>Study III</td>
<td>32</td>
</tr>
<tr>
<td>Study IV</td>
<td>33</td>
</tr>
<tr>
<td>Study V</td>
<td>35</td>
</tr>
<tr>
<td>DISCUSSION</td>
<td>39</td>
</tr>
<tr>
<td>Methodological discussion</td>
<td>39</td>
</tr>
<tr>
<td>Factual discussion</td>
<td>42</td>
</tr>
<tr>
<td>CONCLUSION</td>
<td>53</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENT</td>
<td>56</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>58</td>
</tr>
<tr>
<td>PAPERS I – V</td>
<td>67</td>
</tr>
<tr>
<td>APPENDICES</td>
<td>129</td>
</tr>
</tbody>
</table>
PREFACE

This thesis is based on the following papers, which will be referred to by their roman numerals:


The articles are reprinted with kind permission from Quintessence Publishing Co Inc.
ABSTRACT

Aim: The main aim of this thesis was to investigate how attitudes influence the latent and manifest need, desire, demand, and utilization for dental implant treatment, considering the gatekeeping process between need and demand, and between demand and utilization of dental treatment.

Material and Methods: A conceptual analysis of the need and demand concept from the literature was a first step in the study. A second step was to examine changes in attitudes toward desire for implant treatment over time, also in relation to dental status, in a population of middle aged and older individuals in Sweden based on two questionnaire studies, one in 1989 and the other in 1999 among the same 3000 participants. The individuals who responded both in 1989 and 1999 constituted a panel of 56% of the 1989 survey sample. Logistic regression models were done with desire of implant treatment as dependent variable. In paper V, a qualitative study using grounded theory was done on the treated patients’ subjective perspective on receiving a fixed implant-supported denture.

Results: An emancipatory perspective with the patient-dentist dialogue was regarded as central for an optimal treatment result in the prosthetic treatment decision-making process. A main finding was that need is established only in a communicative dialogue with mutual respect between the profession and the patient. The study implied that the gatekeeping concept relates to a complex process rendering great differences between demand and actual utilization. The main result from the questionnaires was the huge
increase in interest for implant-treatment from 1989 to 1999. In 1999 almost all (94%) of the study population expressed desire for implant treatment; as many as 92% percent of those who did not express a desire for implants in 1989 had changed their mind 10 years later. The regression analysis showed that older people, non-city residents, and those with one or several missing and unreplaced teeth, changed desire for implant treatment between the study years. Effects of age, residence, and better dental status disappeared during the ten year study period. Those edentulous and those with removable dentures expressed less desire than those with all teeth remaining, or only one or a few teeth missing, in 1989. High income significantly increased the probability to desire implant treatment for the study panel at both study occasions. The qualitative study, using the method for grounded theory, gave as core category and main finding the importance of the patients’ trust and confidence in the dentist and his/her staff, in the process of transforming desire for dental implant treatment into manifest demand, and also making it more likely for the patients’ to become satisfied with the treatment result regardless of complications.

**Conclusion:** There is no objective need in prosthodontic treatment. Manifest need and demand change over time, and are influenced by the patients’ attitude and situation, and by the dentist’s practice profile. True need can only be identified in a dialogue between the professional and the patient.

Income and dental status, but not age, place of residence, nor concern for dental appearance, influence desire for implant treatment at the end of the studied 10-year period. Individuals with removable dentures, or those being edentulous in one or both jaws have a lower probability to desire implant treatment than those with all teeth remaining, or with missing teeth replaced by fixed partial dentures.

The qualitative study underlined the importance of the relationship between the professional and the patient. The patients’ trust and confidence in the dentist and his/her staff were decisive in the process of making a demand for implant treatment manifest and turning it into actual utilization. The informants from this study described their confidence and trust as dependent on a communicative dialogue with mutual respect between the patient and the professional.
**POPULÄRVRVETENSKAPLIG SAMMANFATTNING**

**Syfte:** Det primära syftet för denna avhandling var att undersöka hur attityder påverkar latent och manifest behov, önskemål/efterfråga samt även hur attityder påverkar vårdutnyttjande av protetisk rekonstruktion med hjälp av käkbensförankrade implantat, med speciellt intresse för gatekeeping/hinders-processerna mellan behov och efterfråga och mellan efterfråga och vårdutnyttjande.

**Material och Metod:** Som första steg i avhandlingen gjordes begreppsanalys av begreppen behov och efterfråga (need and demand), som de beskrivs i litteraturen. Som andra steg undersöktes attitydförändringar gällande processen att eventuellt efterfråga implantatbehandling, som skedde under ett decennium, hos en grupp av medelålders och äldre i Sverige, i relation till bl.a. tandstatus. Denna studie baserades på två enkäter till samma 3.000 deltagare, den första enkäten 1989 och den andra 1999. De som besvarade båda enkäterna, 56% av de ursprungliga 3.000 deltagarna, utgjorde panelen i denna studie. De statistiska analyserna utfördes med logistisk regression där önskemål/efterfråga var den beroende variabeln. I artikel V, en kvalitativ studie, användes metoden grounded theory för att undersöka behandlade patienters subjektiva uppfattning om att bestämma sig för och därefter genomgå behandling för att få en fast käkbensförankrad bro.

**Resultat:** För att uppnå ett optimalt resultat av beslutsprocessen gällande eventuell implantatbehandling var en dialog mellan

Sammanfattning: Det finns inget objektivt behov av protetisk behandling. Manifest behov och vårdefterfråga förändras med tiden och påverkas av patientens attityd och situation och av behandlande tandläkarers vana av och intresse för olika terapier. Verkligt behov kan bara identifieras i en dialog mellan behandlare och patient. Inkomst och tandstatus påverkade ett eventuellt önskemål om implantatbehandling vid slutet av den undersökta 10-årsperioden, vilket inte äldre, bostadsort och intresse för det dentala utseendet gjorde. Individer med avtagbara proteser eller de som var tandlösa...
i en eller båda käkarna hade en lägre sannolikhet att efterfråga implantatbehandling än de med alla tänder kvar eller de individer där saknade tänder var ersatta av fast protetik.

Den kvalitativa studien underströk betydelsen av ett förtroendefullt förhållande mellan tandvårdspersonalen och patienten. Patientens förtroende och tillit till tandläkaren och hans eller hennes medarbetare var avgörande i den beslutsprocess där ett behov av implantatbehandling blir manifest för att därefter förvandlas till verkligt vårdutnyttjande. Informanterna från den kvalitativa studien beskrev att deras förtroende och tillit grundades på en dialog med ömsesidig respekt mellan patient och behandlare.
INTRODUCTION

Many middle-aged persons share memories of older relatives who every evening put their teeth into a glass of water. This changed their appearance and seemed to diminish their self-esteem. With a personal note, my own grandparents wore dentures from their early middle-age and I remember as a child how they sometimes had quite mysterious ways of eating fresh fruit or meat, but for what reason I did not realise until I had started my career as a dentist. Today it is obvious to me that they, besides their chewing-problems, also were uncomfortable with their dentures and in some aspects also ashamed of their facial aesthetics looking as old persons without their dentures, regardless their actual age.

Even if dental health has improved greatly during the last decades, there are still many who wear dentures, often meaning a social stigma and dental malfunction, social and physiological handicaps.

In contrary to my grandparents’ situation, it is today possible to regain the feeling, comfort, and self-esteem of having fixed teeth by treatment with implant-supported fixed dentures. Some, but not all, choose this possibility of once again having fixed teeth.

What factors affect this decision-making process? Why do some choose one treatment option and others another, when the choice from the professional’s point of the view should be quite obvious: fixed teeth! This issue, including the variations in the patients’ need, demand, and utilization, and its gatekeeping factors, has caught my interest since a few years which has resulted in this thesis, based on a series of five papers.

The concepts of need and demand are central in studies on dental care. In the literature, a normative definition is often used but pays
little attention to the individual’s personal comfort and quality of life. Need and demand for prosthodontic services are difficult to measure since prosthodontic treatment is highly individual and not necessarily related to edentulousness.\textsuperscript{2,3} Need, however defined, does not always lead to demand for treatment\textsuperscript{4}, depending on a variety of factors. For a correct assessment of a patient’s oral health, both a clinical examination and a dental history obtained in a dialogue are necessary. Poor oral health has traditionally been regarded as a component of treatment need, but such need is also socially constructed and established in the interaction between patient, society and dentist.\textsuperscript{5}

This interaction also makes demand dependent on available treatment options from the care provider and from the society. It is of interest to study how need may be transferred into demand, and the mechanisms involved in such a process. Studies have shown that several gate-keeping processes are involved when need is transformed into demand. The concept “gate-keeping” has been identified as the social and psychological processes that transform need into demand, and demand into utilization.\textsuperscript{6-8}

Many factors are involved in the prosthodontic decision-making and treatment processes. The patient’s financial situation is considered as having a great impact, and the dentists’ preference is also a factor of importance in this context.

In the recent decades, treatment with dental implants has been established as an important component in the range of prosthodontic treatments. Dental implants have made dramatic improvements of oral rehabilitation possible for edentulous people, especially for those unable to adapt to dentures.\textsuperscript{9} The need and demand for prosthetic treatment, and especially implant treatment, has changed for many persons during the last decades, in line with the development of society. In most Western societies, we are witnessing a shift into a demand-driven approach in health care.\textsuperscript{10} The overall desire for a better oral health related quality of life has become a reality in prosthetic dentistry, although studies indicate that need as assessed by dentists overestimates the rehabilitation need, in comparison with assessment by patients.\textsuperscript{11-13}
AIMS

The general aim of this thesis was to evaluate need and demand for prosthodontic treatment, especially dental implant treatment, but also to evaluate the importance of gatekeeping factors, and changes in attitudes towards the implant treatment modality in a longitudinal study. And finally, by using a qualitative method, to describe the treated patients’ process from latent need, over manifest need, all the way to maintenance after the actual treatment.

Specific aims
The specific aims in this thesis were to:

- Set the theoretical ground for the analysis of data from a longitudinal study by a conceptual analysis of need and demand for prosthodontics treatment. (Paper I)

- Analyse the gate-keeping process between need and demand, as well as between demand and utilization of dental treatment, from a theoretical point of view regarding treatment with dental implants with respect to the patient, to different treatment options, and to service utilization. (Paper II)

- Examine changes in attitudes toward desire for implant treatment over time in a population of middle aged and older individuals in Sweden. (Paper III)

- By constructing multivariate models investigate possible factors explaining desire for implant treatment, and possible
factors explaining changes in attitudes towards desire for implant treatment in a population of middle aged and older individuals in Sweden over a ten year study period. (Paper IV)

Study and describe the process patients missing several or all teeth go through before treatment with a fixed implant-supported denture, and to identify the treated patients’ experience of changes in oral health related quality of life after implant treatment, by using the constant comparative method for grounded theory. (Paper V)
MATERIALS AND METHODS

Study I and II
A literature survey was done by applying the PubMed database. PubMed provides access to bibliographic information which includes Medline; covering the fields of dentistry medicine, nursing, veterinary medicine, the health care system and the preclinical sciences.

Search was continued in MEDLINE and PSYCINFO. The survey covered the period from 1994 to August 2002 and used the Medical Subject Heading (MeSH) terms:
1) need OR demand OR attitude OR requirement;
2) prosthodontics OR dental implants) OR dentistry OR dentists;
3) Combination 1) AND 2)
4) Limits: English, Human

The search strategy resulted in 509 articles of which 147 abstracts were collected from the articles with an approach to dentistry or with concentration to conceptual analysis of the MeSH terms in the first selection group. Further a hand search was made among the references in these papers for more articles of special interest resulting in a total of 99 articles used as references.

Study base in study III and IV
Two questionnaire studies were performed by professor Sigvard Palmqvist, one in 1989 and the other in 1999 among the same 3000 subjects aged 45-69 years in Örebro County, Sweden. The participants were randomly selected from the official population
register. This Swedish county has about 280,000 inhabitants and was considered average socially and economically at the time of the studies. A questionnaire was mailed to all subjects, and the response rate in 1989 was 79.4% (2383 individuals).

Of the original sample, 2708 respondents were found in the national population register 10 years later, on the basis of the criteria that they were alive and still had residence in Örebro County. In 1999, a new questionnaire was mailed to them.

The number of respondents in the 1999 survey was 1848, yielding a response rate of 68%. Among those, 1665 (90%) responded also in the 1989 survey. The individuals who responded both in 1989 and 1999 constituted the panel used in this study and accounted for 56% of the 1989 survey sample.

Non-response in study III and IV
A non-response analysis has been presented in an earlier study. When comparing those who responded only in 1989 with those participating in both 1989 and 1999, there were significant differences between the groups. The subjects who responded at both occasions were, compared with those who responded only in 1989, younger, had a higher level of education and reported better dental status, i.e. fewer of them wore removable dentures. Also women and those who were married or cohabitants had a higher degree of responding to both questionnaires.

Among those responding both in 1989 and 1999, however, no significant differences in dental conditions were noted between non-response groups and the other subjects.

Internal non-response varied for different questions, which means different n values for different analyses. There was in 1999 a relatively high non-response for questions regarding implant desire, 21%. In 1989 the largest internal non-response was seen for the question regarding the importance of good dental appearance, 14%, and income, 11%.

Questionnaire in study III and IV
The questionnaire aimed, among other items, at measuring dental conditions and opinions regarding dental implants, and at gaining information about demographics, social structure, oral health
related quality of life, desire for various kinds of prosthodontic treatment, and psychological factors of interest. The variables used in the questionnaire have been published previously. The validity of answers with regard to dental conditions has been analysed in a previous study.

There were questions related to the subjects’ dental conditions and desire for implant treatment. Participants missing one tooth or more and not being replaced, and those completely edentulous with or without removable denture(s), were in the present study considered as having a possible treatment need. A hypothetical demand is in this study described as desire for implant treatment. The following questions were addressed to catch desire for implant treatment:

You who are missing teeth in one jaw, totally or partially, would you in general prefer treatment with dental implants, if possible? (3 alternatives: yes, no, uncertain)

You who are missing some teeth and have a removable partial denture, would you instead prefer treatment with dental implants, if possible? (3 alternatives: yes, no, uncertain)

You who are missing all your own teeth in one or both jaws, with or without removable denture(s), would you instead prefer treatment with dental implants, if possible? (3 alternatives: yes, no, uncertain)

If you who have all your own teeth left would lose one or a few teeth, what treatment would you prefer? (4 alternatives with implants as one of them)

If you who have all your own teeth left would lose all your teeth in one jaw, what treatment would you prefer? (4 alternatives with implants as one of them)

The questions aimed to address respondents with all kind of dental status.

Those responding that they would choose dental implants were considered having a possible desire for such treatment which was set as the dependent variable in the regression models in study IV.
The following variables from the questionnaires were used as independent variables in study IV:

- age in years: 3 categories 45-49 years, 50-59 years, 60-69 years (in 1989)
- individual income divided in 8 equidistant groups: <100,000 SEK; 101-150,000 SEK; 151-200,000 SEK; 201-250,000 SEK; 251-300,000 SEK; 301-350,000 SEK; 351-400,000 SEK; >401,000 SEK.
- gender (male; female)
- marital status (married and cohabitants; single)
- education (low: ≤9 years, medium: 10-12 years, high: ≥12 years)
- place of residence (city; village or rural)
- dental status in 4 categories
  - I: all teeth left i.e. all teeth remaining or all missing teeth replaced by fixed partial dentures
  - II: one or several teeth missing i.e. one or several teeth missing and not replaced by fixed partial dentures
  - III: removable denture i.e. wearing removable partial denture(s) and not edentulous in any jaw
  - IV: totally edentulous in one or both jaws i.e. edentulous in one or both jaws and wearing or not wearing denture
- patient at dental care delivery system (private practice; public dental health system)

There were also two attitudinal scales in 7 steps which were dichotomized in the analysis:

- importance of dental function (unimportant; important)
- importance of good dental appearance (unimportant; important)

Internal non-response varied for different questions.
The two questionnaires were identical except for a few new questions added in 1999 about the number of lost teeth, prosthodontic treatments, and various complications having occurred since the previous study. Written information about costs and treatment procedures for implants was included in both questionnaires. The information included estimated costs for a complete arch fixed implant-supported prosthesis in the maxilla, for a single tooth implant restoration, and for a complete upper and lower denture. The costs for implant treatment were considerable, although such treatment was subsidized by the national dental insurance system in Sweden. For example, the treatment costs for a complete arch fixed implant-supported prosthesis was approximately 5 times higher than for conventional removable dentures both 1989 and 1999.

The total panel was divided in two groups, those with and those without changes in dental conditions during this period, to evaluate their need for implant treatment.

**Study V - Qualitative method**

The constant comparative method for grounded theory, originally described by Glaser & Strauss (Modified grounded theory) was used in collecting and analysing data.\(^{19, 20}\) This qualitative method aims at generating concepts, models, and theories, grounded in empirical data. Grounded theory aims to develop understanding and interpretation of the individuals’ description of experiences rather than to try to seek “the objective truth”. The basic principles of grounded theory include concurrent sampling and analysis, constant comparisons, theoretical sensitivity, and saturation. Saturation is reached when new interviews do not bring additional information into the categories devised in the earlier interviews.\(^{21}\) Grounded theory is one out of approximately thirty qualitative research methods and includes both induction and deduction, which means constructing a hypothesis from the obtained data, making conclusions with a starting-point from the hypothesis. Induction is a main part in grounded theory, one of the differences to quantitative research. Criteria for judging the quality of a grounded theory study\(^{22}\) is described in paper V.

One assumption in qualitative research is that data are brought forward in interaction between researcher and informant.\(^{21}\)
Therefore, the relationship between these two subjects should be paid attention to, because of its importance for the results. This reflexivity includes that the researcher must identify preconceptions which might bias the interview.\textsuperscript{23}

**Study group in study V**

Ten informants (six women and four men; mean age 69 years, range 54-84 years) participated in the study. The informants were patients at the Specialisttandvården Kaniken, Folktandvården (Specialist Dental Care Kaniken, Public Dental Health Services), Uppsala, Sweden, according to well-known and accepted procedures.\textsuperscript{24} The patients were strategically selected from the register at the clinic on the basis of gender, age, and place of residence and treated by other dentists than the authors.

**Procedure study V**

Each subject was informed by letter about the study and asked if they were willing to participate. Written and verbal information concerning aim and procedure of the study was given to all subjects. After a written consent, time for a taped interview was scheduled with each individual.

**Approach Study V**

An open, taped interview was conducted with each subject. An interview guide was used, closely described in paper V.

The interviewer was a prosthodontist (first author paper V) without knowledge of the informants and without involvement in their treatment. Each question theme gave the opportunity to a broader discussion, as for example a variety of potential gatekeepers. Data collection and analysis were conducted after each interview and continued until new interviews did not provide additional information. This saturation was reached after 10 informants.

**Statistical methods in study III and IV**

Statistical significance in study III was determined through Pearson chi-square test with $p<0.05$ as significance level. For dichotomous responses, Odds Ratios (OR) with 95\% confidence intervals were also calculated.
Three different logistic regression models were used in study IV for analyses of the responses for those participating in 1989, in 1999, and for analysis of the differences in response between those who participated both in 1989 and 1999.\textsuperscript{25} The effect of independent variables was expressed as odds ratios. Nagelkerke (pseudo) R-square, classification plots, and correctly predicted cases were calculated for determination of goodness of fit of the models. The same model was used for analysis of non-responders. Frequency distributions were calculated for the various measures. The statistical significance of differences was determined through Pearson chi-square test with p<0.05 as significance level. All calculations were done in SPSS 11.0.

Data analysis study V
The interviews were transcribed verbatim and analysed in open, axial and selective coding processes,\textsuperscript{19,20} described in paper V, resulting in the identification of a core category, central in the collected data and related to subcategories.

Ethical aspects
The study design of paper V was supported by the Research Ethics Board at Uppsala University, Sweden. Requirements concerning informed consent and confidentiality were promised and secured.
RESULTS

Study I: What is Oral Rehabilitation Need?
A conceptual analysis of need and demand for prosthodontic treatment.

The concept of “need” belongs to the social sciences. There is no generally accepted method for measuring human welfare, because of the difficulties to define human needs. Moreover, human needs have been considered to be relative rather than absolute. If need is defined by professionals, this simply puts one subjective opinion — the professional’s — against another subjective opinion: the patient’s. In a conflict situation, the strongest party prevails, which usually is the profession. A subjectivist and relativist conception of need therefore inevitably gives a disadvantage to those who are too weak, too old, or too sick to express their own needs, precisely those persons whose needs the professional should try to meet.

There are, though, theories suggesting that objective needs do exist and that the most important attributes are physical health and autonomy. The autonomy is impaired when there is a deficit of three attributes: mental health, cognitive skills, and opportunities to engage in social participation.

There are other simpler attempts to define objective needs, and one theory suggests that there is a hierarchy of needs, where the most basic needs must be met before needs higher in the hierarchy can be actualized. This implies that health needs must thus be satisfied before autonomy, since the need for health is a condition for subsistence.

A taxonomy of need was presented in 1972 by Bradshaw where he divided need into four separate definitions:
**Normative need** is that which the expert or professional defines as need in any given situation. A “desirable” standard is decided and compared to actual circumstances.

**Felt need** is equated with *want* expressed after self-assessment by the individual or the population. In a study of prosthodontic treatment need, it was shown that subjective need without a normative need is rare.\(^{11}\) Normative and subjective need coincided only in one third of the studied treatments. Normative need was significantly higher. The discrepancy between normative need and subjective need is in accordance with other reports.\(^{29-32}\)

**Expressed need** is equivalent to demand i.e. felt need turned into action.\(^{28}\)

**Comparative need** is assessed by studying the characteristics of a population using a service. If there are people with similar characteristics not receiving service, they are in need. This definition has been used to assess needs both of individuals and areas.

Sheiham and Spencer have analyzed normative need as being a commonly used type of need assessment in dental health planning.\(^{33}\) However, by using normative need diseases are identified without considering the subjective perception of the patient and its relevance to the disease-oriented or biomedical approach. Sheiham and Spencer\(^{33}\) find that there are four major shortcomings of normative need:

**First**, professional judgements are neither free of individual valuation nor objective. There is intra-examiner and inter-examiner variability in judgement and decision-making.\(^{16}\) Variables such as age, practice beliefs, and price competition in the marketplace have effect on treatment.\(^{34}\) For example, many young dentists in Sweden today have little or no experience in complete denture treatment unlike general practitioners a few decades ago, which could lead to avoidance of proposing such treatment options because of lack of experience.\(^{35}\)
Second, the normative need defined by dentists does not necessarily correspond to the experienced need of the patient. Patient satisfaction is not always related to the clinical assessment and for example, lack of posterior teeth leads to demand for prosthodontic treatment only in some situations. Both type and quality of the treatment is important, but not decisive for patient satisfaction, although there is a relationship between health-related quality of life measures and clinical oral indicators.

Third, there is not always correspondence between political and professional need assessment. An example can be found in the Swedish National Dental Health Insurance System a few years ago, where persons aged 65 years and above received a highly subsidised part of the total cost for prosthodontic treatment, irrespectively of their dental health or paying ability. This was a purely political decision without professional support.

Fourth and finally, there are not always resources to meet a normative need. All dental needs cannot be met. The need definitions depend on realistic treatment possibilities. Economic subsidies make new treatments available, e.g. dental implants.
Study II: Need becoming demand, demand becoming utilization. Gatekeeping processes from a theoretical point of view.

Need does not always lead to demand for treatment, nor to utilization, depending on the gate-keeping processes between need and demand and between demand and utilization. The concept “gate-keeping” refers in this context to the social and psychological processes that transform need into demand, and demand into utilization.\(^6\)\(^8\) It implies that they are complex processes that can render great differences between demand and actual utilization. It is not possible to estimate patients’ need for prosthodontic care, since there is no objective need.

The process between need and demand is influenced by several factors identified as barriers or gatekeepers.\(^3\) Need can be regarded as latent or manifest. Becoming aware of a latent need, which eventually becomes manifest, is a multifactorial process which involves:

- oral health and edentulism
- quality of life and perception of need
- psychological factors (e.g. dental anxiety state)
- health beliefs (attitudes, values, and behaviour)
- social structure (education, occupation, and ethnicity)
- demographics (age, gender, marital status, and income).

Edentulous patients with denture problems do not necessarily translate such concerns into demand for treatment.\(^3\) Most edentulous individuals adapt to wearing complete dentures, but for some, impaired oral health resulting in losing the natural dentition or only a part of it is a serious life event and has been compared with other stressful events such as divorces or retirement.\(^4\) It can be experienced as a mutilation, a serious change of life.\(^5\) A greater concern about demand is a consequence of the realization that there is no objective need. Still, in most cases demand must be recognized as the result of an actual need.

A missing upper anterior tooth is a strong incentive for demanding treatment, while loss of a posterior tooth usually is not. Position and number of teeth have a definite impact on need for prosthodontic treatment.\(^4\)\(^2\)\(^4\)
There are contradictory results when replacing lost teeth with removable dentures, indicating that demand is dependent on the patient’s opinion.\textsuperscript{44} It has been shown that about 25-50\% of the individuals who had removable dentures seldom or never use them.\textsuperscript{45} Cost factors seem to play an important role also here, and there is a higher probability for low dental care utilization among those who consider dental care as expensive compared to those who state no problem with cost.\textsuperscript{45}

Four main groups of psychosocial factors have been identified to act as gatekeeping barriers between need and demand: a) dental anxiety states, b) perception of need, c) financial costs, and d) lack of access.\textsuperscript{46} The two latter factors mainly belong to the gate-keeping process between demand and utilization. Concern about oral health has been reported as significantly predicting perceived treatment need.\textsuperscript{47} Individuals who regularly attend a dental office are likely to have a much higher perceived need than irregular attendees. Barriers such as fear of pain and anxiety, cost and long waiting time have been found to have little influence, but the dentist’s recommendation was important.\textsuperscript{11,48}

Dental anxiety is one of the major parts in the psychological barrier between need and demand. It appears to be mostly dependent on experiences from youth\textsuperscript{49} but might sometimes be used as a pretext not to fulfil a demand because of a poor economic situation.

Healthy teeth are important to most people regardless of age.\textsuperscript{50,51} But dissatisfaction with appearance has also been found to be a major reason for transforming need into demand.\textsuperscript{52} New adhesive techniques with veneers and all-ceramic restorations require minimal tooth-preparation. The increasing commercialization of the body image and the change in social normative standards have resulted in subjective demand for cosmetic dental care where dentists sometime may have difficulty identifying patients’ need. However, demand for cosmetic dental care varies in different age groups and in different cultures. Expectations of dental health status and dental care may vary between individuals with different social norms and cultural traditions.\textsuperscript{53,54} Edentulism following dental disease is considered as a most likely development and a natural part of life in some ethnic and social groups.
There seems to be a gender variation in the social impact of oral health on perceived quality of life. Women are reported to assess oral health as more important while men rank chewing ability higher.\textsuperscript{41,55-57} Another study show that elderly females are less satisfied with conventional dentures than elderly males with regards to aesthetics and ability to chew, but equally satisfied with implant overdentures.\textsuperscript{58} But there are also reports indicating contradictory results regarding need for prosthodontic services between men and women.\textsuperscript{41,59,60}

Edentulism may be correlated with age and gender and is also more prevalent in rural areas, while there seems to be a greater demand for treatment in more densely populated areas.\textsuperscript{62,61} Factors such as ethnicity, cultural attitudes, and standard of living have an impact on need and attitudes toward dental care where e.g. citizens in urban Western societies have a much higher level of demand for treatment than patients in less developed countries.\textsuperscript{62} Individuals with a high level of education, prominent occupation and high income have a lower barrier compared with those who have a low level of education and a reduced financial capacity. It is likely that the global internationalization and growing prosperity may change the need for dental treatment, and through changes in the gate-keeping processes, new demands could be developed. Moreover, technical achievements in the field of prosthetic dentistry may also contribute to a change in demand among individuals.

The process between demand and utilization is closely correlated to social and economic factors, which can act as inhibitors or prohibitors in the process between a demand and utilization of this demand. Gate-keeping mechanisms have been used to control costs of care and to promote cooperation between different groups of care providers.\textsuperscript{39}

Originating from models of health service utilization, explanatory models for utilization of dental care have been put forward,\textsuperscript{63,64} described in paper II.
Study III: Changes in attitudes toward desire for implant treatment. A longitudinal study of a middle-aged and older Swedish population.

The main result was a dramatic escalation in interest for implant treatment during this period.

In 1999 almost all (94%) of the cohort expressed desire for implant treatment. Ninety-two percent of those who did not express a desire for implants in the first questionnaire had changed their mind 10 years later. There was a very high probability (OR=3,9) that participants who wanted implant treatment in 1989 held the same opinion 10 years later.

There were age group differences among those who desired implant treatment in 1989. Reported desire for implant treatment decreased with higher age. There were no significant age differences in 1999 since almost all desired implants. The results are shown in the tables of paper III.

Forty-seven of the 111 edentulous individuals (7% of the panel), answered the questions regarding desire for implant treatment. Two thirds of those (32 individuals) reported a desire for implant treatment at the time of the second questionnaire study. Of those who were edentulous and not interested in having implant treatment in 1989, 38% changed their opinion and reported an affirmative attitude in the study 10 years later.

The increase in desire for implant treatment was similar between those who reported changes and those without changes in dental conditions over the 10 year period.

Those having a possible treatment need, missing one tooth or more, and with or without removable dentures had a significant increase in desire for implant treatment between 1989 and 1999, while there was no significant increase among those without such a need.

Cost was the major reason for not choosing implants among subjects reporting one or a few teeth missing and not replaced and those with removable denture(s). No significant changes were observed from 1989 to 1999.
Study IV: Factors explaining desire for therapy with dental implants. An analysis of the results from a longitudinal study.

Older people, non-city residents, and those with one or several missing and un-replaced teeth, changed desire for implant treatment between the study years. Effects of age, residence, better dental status, and concern for a good dental appearance disappeared during the ten year study period. Those edentulous and those with removable dentures (pseudo R^2 0.17), expressed lower desire than those with all teeth remaining, or with only one or a few teeth missing (pseudo R^2 0.24) in 1989. High income significantly increased the probability to desire implant treatment for the study panel at both study occasions (p = 0.016 resp. 0.034).

A logistic regression model was constructed with the dependent variable respondents stating a desire, in contrast to those without a desire for implant treatment in 1989. It showed a significantly higher probability to desire implant treatment for the independent variables higher income, younger age, better dental status, urban living, and concern for a good dental appearance. Income had the strongest association with a desire for implant treatment. There was a 7% higher probability to desire implant treatment between each of the 8 equidistant groups giving a total of a 56% higher probability to desire implant treatment for those with the highest level of income than for those with the lowest level.

The association between a desire for implant treatment and dental status was however not expected. Those with a higher “objective” need, i.e. those with removable dentures and those being edentulous, had a lower probability to desire implant treatment than all other categories of dental status.

Another logistic regression model was constructed for the population responding in 1999 in the same manner with the dependent variable respondents desiring implant treatment in contrast to others. High income, still, increased the probability to desire implant treatment for the total population. There was also no change in associations as to dental status. However, there was a change in desire for implant treatment for those wearing removable partial dentures or being edentulous in one or both jaws. For this subgroup the independent variables dental care delivery system and
education level showed a significantly higher probability to desire implant treatment for those attending private practise and for those with medium education level.

The final logistic regression model was done with the responses to the question about desire for implant treatment from 1989 in contrast to the responses to the same question in 1999. Young age, urban living and better dental status showed a higher probability for a desire for implant treatment in 1989 than in 1999.
Study V: A grounded theory on important factors involved in the treated patients’ decision-making process for implant therapy.

The emerging core category was the participants experiences from social stigma to exhilaration. A great improvement in oral health related quality of life was stated.

The informants’ stories illuminate the journey from deteriorated dental health with pain and lowered self-esteem which resulted in social withdrawal e.g. social stigma, to the decision of going through with implants treatment to feelings of gratitude and feelings of becoming the person one once was. This process ended up in a more realistic perspective that their new life with dental implants indeed was very good and meant an end of their social stigma. However the process had some gatekeepers, such as fear of pain, including the risk of having problems afterwards with the implants, and costs. The dentist’s opinion and suggestions was the most decisive part in the decision making process and the trust in the dentist and his/her dental team was crucial for the decision to undergo treatment, and for the whole experience with the treatment.

All of the informants had considered the possibility of implant treatment for some time. Some made their decision after initially having discussed it within the family, others because of comments from acquaintances, advertisements, or because of the lack of taste when eating which was reported by all, and the feeling of loose dentures. It was obvious that the trust in the dentist and his/her skills was a very important part in the decision making process but perhaps an even more important part was the possibility to discuss the treatment options with the dentist, especially having the chance of discussing their individual need for treatment. Some of the informants changed dentist during this process because of lack of trust.

Only two gatekeeping factors were mentioned by the informants, cost and dental anxiety. Cost was considered as a gatekeeping factor of little importance. All but one of the informants said that they would desire and demand this treatment at almost any cost and were prepared to take a bank loan, if necessary. A correct estimation of cost together with a pronounced trust in the dentist seemed to be of importance in the decision process.
The journey from social stigma to exhilaration are discussed in paper V and could be divided into four different parts:

**First:**
**Becoming an unsecure person**

*Experience decreasingly worsened oral health*

The participants described a history of many years of deteriorated oral health causing physical pain, infections and discomfort and it also caused difficulties with for example chewing, fear of cleaning their teeth because of the risk of losing teeth.

*Living in pain and anxiety*

Finally the participants lost so many teeth or all teeth that they had to wear a denture which was even worse than the deteriorated oral health. The dentures caused physical pain and sourness and were connected with feelings of shame and a variety of practical problems. The social consequences were massive for the participants and they did not tell anybody that they had a denture except to their closest family.

A sense of powerlessness was reported by participants. They could not do anything about their ability to adapt to their denture.

**Second:**
**Becoming a determined person**

*Desire for a better solution turn in to demand*

The participants described how they finally felt a desire for a better solution of their dental problems than wearing a denture. The life situation with the denture was unacceptable with all the reported difficulties. The participants described the cost for dental implants as a gatekeeping factor of little importance in the process of deciding whether to have or not to have the implant treatment.

*Having trust in the dentist*

It was of great importance for the participants to find a dentist they could really trust in both regarding medical skills and as a person. The feeling of being involved in the treatment was important. The participants knew about dental implant treatment since long through media, from dentists or relatives, or by advertisements, but their
definite decision was made after discussion with their family and ultimately with their dentist, where trust in the dentist was decisive. Dental anxiety for the treatment was seen as a minor problem which also was considered dependent on their trust in the dentist.

_Going through with the treatment_  
The participants were very satisfied with the result of the implant treatment, feeling restored in oral function and aesthetics and giving a regained self-confidence and self-esteem. Some of the participants put the oral-facial aesthetics forward as the most important over-all factor for self-confidence. The treatment outcome was described by all the informants as a substantial improvement in oral comfort and in quality of life even though some of the participants described pain after the implant operation and some had experienced difficulties with implants which did not integrate, giving prolonged treatment and re-operations. No-one described this as having any negative influence on their opinion of the treatment, which they all considered as a success. Those with the experience of disintegrated implants did all blame themselves of causing the unsuccessful osseointegration of the implants. No one considered this as a result of poor management from the dentist.

**Third:**  
_Becoming the person I once was_  
_Being free from the prison of pain and social stigma_  
The totally dominant opinion was the feeling that implant-supported fixed partial dentures felt better than a conventional fixed partial denture and was comparable to their own natural teeth. It felt and functioned physically as their own natural teeth. The sense of regained security was very common.

For those who had had recurrent infections, loose teeth, or badly functioning dentures, the fixed implant supported denture gave the patients the feeling of good dental status and of being orally healthy for the first time for many years. They did not have to visit their dentist as often as before and they were pain-free. They felt orally healthy.

A fixed implant-supported denture was compared with having own natural teeth also when it came to aesthetics.
**Having feelings of gratitude**
All the participants spontaneously expressed gratitude to the dentist and his/hers staff. The trust in the dentist and the skills of the staff was pointed out by all the informants in almost every aspect of the implant treatment.

**Forth:**
**Being caught by a more realistic perspective**

*Being hit by the pale cast of thought*
After a while after the participants treatment and their feelings of becoming the person they once was and feelings of gratitude they started to be aware of minor negative side effects of the implants. Most of the participants found it difficult to keep up optimal dental hygiene. Those informants who received a fixed implant supported denture in the upper jaw reported difficulties in speech. This seemed to diminish over time, though.
DISCUSSION

Methodological discussion
This thesis is based on a series of articles aiming to analyse how to estimate individuals’ need and demand for prosthodontics, especially with dental implants, and its gatekeeping processes. The thesis also aims to evaluate changes in attitudes and relevant factors regarding these issues from two questionnaires in a longitudinal study. As a part of this exploration an interview study was also performed, following the grounded theory concept, describing the treated patients.

The conceptual analysis of need and demand and utilization in study I and II was started by a literature search from PubMed and resulted in articles both from dentistry and from other sciences. A supplementary search was conducted 2011 giving some articles with relevance to this thesis.

The population selection in the questionnaire studies III and IV could of course be a matter of discussion. The material was collected by others (professor Sigvard Palmqvist et al) and here a secondary analysis is done. The 3,000 participants were over the age of 45 and randomly selected from the population register. The response rate for those responding at both occasions was 56% of the 1989 total survey which must be considered adequate in a longitudinal study stretching over a decade. As the aim was to investigate changes in attitudes over time this would implicate that the non-response rate should be less important because it was the same individuals at both occasions. The changes in attitudes are principally intra-individual, giving strength to the result.

Comparing those who responded only in 1989 with those participating in both 1989 and 1999, gave some significant
differences.\textsuperscript{16} Those who responded at both occasions were younger, had a higher level of education and reported better dental status. Internal non-response varied though for different questions. Still, the material was considered relevant and reliable for the present studies.

The patients interviewed in study V was selected from the register of a clinic with specialists in prosthodontics to which the patients had been referred. The informants were selected on the basis of gender, age, and place of residence from both cities and rural areas and they were recently treated with dental implants. No consideration was paid to personal factors as health, level of education, dental experience, or socioeconomic factors in this selection process.

Saturation was reached after interviewing 10 informants giving adequate variation regarding the factors not included in the selection process, which is desirable in qualitative studies.

\textbf{Validity}

The questionnaires in study III and IV included questions about dental condition. The answers showed high agreement in a validation study performed earlier among the subjects in the 1989 questionnaire when comparing self-reported dental status and the result from a clinical examination.\textsuperscript{17} This is in accordance with another validation study on congruence between clinical findings and patients' self-reported oral status.\textsuperscript{65} Attitudinal questions can of course not be validated, lacking comparison data.

When discussing the design of a qualitative study you consider both internal and external validity. The sampling procedure with data collection until saturation is reached is considered as being closely related to internal validity.\textsuperscript{66} The emerging categories, describing trust and confidence in the dentist, were all grounded in data and along with the quotations intended to show the trustworthiness of our study and the internal validity. External validity concerns transferability to a new context.\textsuperscript{66} My opinion is that the results from this study could be transferable to other groups treated with implant-supported fixed dental prostheses with similar characteristics to our study group. As stated in study III in this series of papers, there was a huge increase in interest for implant treatment from 1989 to 1999. Almost all (94\%) of the study population expressed desire for implant treatment in 1999, one of the main findings here.
Strengths and weaknesses
There are some aspects which should be considered in our studies. The conceptual analysis is based on articles from PubMed but only in English and Swedish. This gives a risk of failing to include opinions and studies of relevance from other countries, or with other cultural and socio-economic background. On the other hand, a hand search was done in the references in these articles giving little to add.

Data for the questionnaire studies were collected in 1989 respectively in 1999 and it could be questioned if the results are applicable today. My opinion is though that the results from these questionnaires still are relevant. At the time for the second questionnaire, a vast majority expressed their opinion that they would prefer implant treatment, in difference to the result at the time for the first questionnaire. As far as I know there has been little change in social priorities, or attitudes towards implant treatment since, meaning that a change back to less desire for implant treatment is unlikely. A recent Austrian longitudinal study \(^67\) showed a higher degree of public awareness of dental implant treatment as a treatment option compared to 2003. The implant treatment acceptance rate in that study did not change during the study period. This indicates a stable level of desire for implant treatment during the last decade, however on a clearly lower level than in our study.

Selection of informants to qualitative studies performed according to grounded theory should be discussed. The patients in our study had been treated with dental implants and had been referred to a specialist clinic, meaning that they had passed gatekeepers as initial discussion of cost, and they had also gone through the decision-making process, and still demanded implant treatment. We did not, though, make any distinctions for other factors as illnesses, economy, or education except for age and urban/rural living. The intention for this study was not to study needy patients without demand for implant treatment which of course would be of great interest, but out of scope for this study.

Statistical Methods
In the third study, statistical significance was determined through Pearson's chi-square test with \(P<.05\). For dichotomous responses odd ratios with 95% confidence intervals were calculated.
Three different logistic models were used in study 4 for those participating in 1989, in 1999, and for the differences in response between those who participated both in 1989 and 1999. A clear strength of this study is the longitudinal design which gives a higher credibility regarding changes in attitudes.

**Factual discussion**

The main purpose was to study factors behind the development of need and demand for dental implant treatment from the patients’ point of view, and attitudes towards this treatment option. Some studies have previously described factors involved in dentists’ decision-making process, but very few have studied the patients’ part of this process.\(^{16,32,34,35}\)

A main finding in this thesis is the importance of the emancipatory perspective in the dentist-patient relation, the importance to a dialogue discussion and participation in the decision-making process. This corresponds well to the finding in study V, that the most important factor was trust in the dentist and his/her staff.

The relationship between dentist and patient is crucial in order to give opportunity for latent needs to develop into manifest needs and demands, and eventually to turn it into actual utilization. The gatekeeping factors seem to diminish in importance when there is trust in the dentist. How patients’ assess the outcome of their treatment seems to be dependent on a positive relationship between dentist and patient. The importance of this right to actively participate in decision-making regarding the management of their tooth loss is also verified in another study as an increasing expectation.\(^{68}\)

Another finding is the very large escalation into having a hypothetical demand for implant treatment shown in the longitudinal study in paper III. Another study from Norway from the same period as our study, though not longitudinal, indicates a somewhat lower awareness of implant treatment as an treatment option.\(^{69}\) As mentioned above there are some recent longitudinal Austrian studies also showing a somewhat lower general awareness of dental implant treatment.\(^{70}\) The reason for the higher levels in our study could be that the participants got information through the first questionnaire and this information was boosted in the second questionnaire. Another reason could be a higher degree of attention
in Swedish media towards dental implant treatment while much of the development of this treatment option and the mechanisms behind osseointegration was occurred in Sweden at this time.

Need and demand and utilization
The idea of objective need, a normative need defined by professionals, has little support in today’s literature. A taxonomy of need was presented in 1972 by Bradshaw where he divided need into four separate definitions: Normative need, Felt need, Expressed need, and Comparative need. Normative need in this taxonomy simply puts one subjective opinion – the professional’s in relation to another subjective opinion – the patient’s.

Sheiham and Spencer found four major shortcomings of normative need:
First, professional judgements are neither free of individual valuation nor objective.
Second, the normative need defined by dentists does not necessarily correspond to the experienced need of the patient.
Third, there is not always correspondence between political and professional need assessment.
Fourth, there are not always resources to meet a normative need. All dental needs cannot be met. The need definitions depend on realistic treatment possibilities. Economic subsidies make new treatments available, e.g. dental implants. Need perceptions and demand grow rapidly which points to another conception of need, the so called “emancipatory need”.

The professionals’ first commitment must be to discern latent needs that are relevant but may be subconscious or unexpressed. The processes between need and demand, and between demand and utilization are influenced by several factors, identified as barriers or gatekeepers as already discussed. Our qualitative study on treated patients indicate that trust in the dentist and his/her staff seemed to diminish most gatekeeping factors. The financial aspects involved in the process related to need and demand for prosthodontic treatment should not be underestimated, and it is well known that edentulism is more prevalent among individuals with low or no income. The treated patients in our qualitative study did not put economy
forward as a gatekeeper, but the respondents in the questionnaire studies had economy as the main gatekeeping factor.

Need and demand for prosthodontic treatment among the partially edentulous individuals are difficult to estimate.

There are contradictory results when replacing lost teeth with removable dentures, indicating that demand is dependent on the patient’s opinion and perhaps not so much on the professional opinion. It has been shown that about 25-50% of the individuals who had removable dentures seldom or never use them, indicating that the inconvenience of wearing dentures sometimes outdoes their gain of having a removable denture.

Prosthodontic treatments are often associated with a high cost for the patient. Supplier-induced demand and dental insurance schemes are factors of interest in that respect. Still, two observations here remain: Trust in the dentist is essential, and needs can change rapidly.

Changes in attitudes towards dental implant treatment

The strong and significant change in desire for implant treatment for the entire panel, as well as for different subgroups, may at least partially be explained by increased knowledge about implant treatment. It is likely that most individuals had a better knowledge about dental implants in 1999 compared with the situation 10 years earlier, due to newspaper articles and information provided by the dentists and maybe also as a learning effect of the questionnaire. The Norwegian study showed that news media like newspaper and TV/radio, together with personal communications, were the most frequently indicated sources of information. The longitudinal Austrian study showed though that the dentist was the main source of patient information.

The overall desire for a better oral health related quality of life has become a reality in dentistry. Further, there is evidence that a high interest in aesthetic dentistry and tooth bleaching among patients could be related to tv-commercials on new cosmetic treatment options. This could be related also to innovations that focus on consumption, which could promote an increased interest especially among the young, wealthy and well educated.
The results from the study indicate a great increase in desire for implant treatment for those with a possible treatment need. This could support the assumption that an individual’s need may turn from latent to manifest, when treatment options having been unrealistic become available. New desires will emerge.

Among the 111 individuals who reported having no natural teeth, with or without removable dentures, the response rate was only 42%. The number of respondents was, however, sufficient to permit some conclusions; 47 persons allowing a precision of about 15%. This rather small group had a lower increase in desire, compared to the total panel. This could be the effect of several socioeconomic gatekeeping processes. Individuals with short education and low income tend to have poorer dental status, in part because of poor finances.

The results from the present study indicate that several edentulous individuals still are not able to afford implant-supported prosthodontics. It is obvious that although Sweden has a general dental insurance system, there are several orally handicapped individuals who are not able to benefit from implants due to high costs.

Another possible explanation could be that older individuals who are accustomed to wear dentures have no or minor interest in implant treatment. Studies indicate that a large number of patients (65-90%) are satisfied with the functional aspects of their dentures, often in spite of technical imperfections identified by dentists. There is also evidence that removable prostheses are more preferred among those who have few or no remaining teeth, compared with those who have only one or a few missing teeth. It appears that those with a removable prosthesis have a lower expectation and demand for oral function and aesthetics, and that satisfaction with removable prosthesis may be a rationalization, in which an attitude could develop through behavioral change. A Canadian study shows gender differences where elderly females are less satisfied with conventional dentures than elderly males with regards to aesthetics and ability to chew but equally satisfied with implant overdentures.
Factors explaining desire for therapy with dental implants

The longitudinal study showed that older people, those living in village or rural areas in comparison, and those with one or several teeth missing and not replaced, had changed their mind into having desire for implant treatment ten years later.

Income and dental status also had a significant impact on the probability to have a desire for implant treatment.

Dental status had a significant impact on expressed desire at both study occasions. Somewhat surprising was that those with a higher “objective” need, i.e. those with removable dentures and those being edentulous in one or both jaws, had a lower desire for implant treatment in contrast to others. It seems obvious from the results of the present study, that edentulous patients with removable dentures do not necessarily translate that condition into a desire for implant treatment, which is in accordance with previous studies. Participants missing one tooth or more not being replaced, and those completely edentulous with or without removable denture(s), were in this study considered as having a possible treatment need. It was not possible to distinguish between the absence of a front tooth or a molar on the basis of the information from the questionnaires. If this distinction had been possible the results could have been even more obvious since participants missing a front tooth probably desire a replacement more.

“Objective” need is less associated with dental care utilisation than subjective need as described in paper IV. This result is also well in accordance with the observations that there usually are great differences between providers and patients assessments of quality of life, where patients usually regard their quality of life as better than the providers do. Those who need implant treatment the most, when assessed by dentists, do not desire implant treatment as much as those with all teeth remaining or with one or a few teeth missing. Presence of own teeth is a significant predictor for dental care utilisation.

Gatekeepers from the questionnaires

In the questionnaires, there were also questions aiming at evaluating reasons for not choosing implant treatment. The structure of the gatekeeping processes determining an individuals’ choice has been
discussed earlier in this thesis. Such processes are multifactorial. For example, there can be combinations of problems of oral health and quality of life, psychological factors and health beliefs, social structure and demographics, and economic factors.

Cost was the major reason for not desiring implant treatment, but also the percentage figures for “scared of surgery” and “scared of un-known side-effects” had slightly increased over the 10-year period. A study of Walton et al. showed that the most common reason for refusing free of charge treatment with implant-supported mandibular dentures was concern about surgical risks.\textsuperscript{79} Dental anxiety appears to be an important gatekeeper in dentistry among many patients.\textsuperscript{43} A recently published study from the UK showed that fear and anxiety, related to the pain of surgery, complications of the procedure and immediate post-surgical denture use, was one of the main reasons why elderly patients who were currently dissatisfied with conventional dentures decline implant treatment.\textsuperscript{84} Women were in our study more concerned about implant surgery and the risk of unknown side effects of implants. Such a gender variation has been discussed in other prosthodontic studies.\textsuperscript{85,86}

The rather small edentulous group in this study had a lower increase in desire compared to the total panel. This could be the effect of several socioeconomic gate-keeping processes.\textsuperscript{87} Many edentulous individuals have low income and it is likely that some do not consider treatments they know they cannot afford even if their oral health-related quality of life most likely would benefit significantly from the use of dental implants.\textsuperscript{88} In such situations, the desire for treatment does not change from latent to manifest. Other reasons could be fear for dental treatment and worry about surgical treatments but it could also be signs of that people really are more satisfied with their prostheses than the profession would consider.\textsuperscript{79,84}

Cost, together with dental status, is a well-known barrier in the gatekeeping behind utilization of dental care, especially for fixed prosthodontic services.\textsuperscript{43,89,90} Persons with low income have a lower level of utilization and spend less money on dental care compared with individuals with higher income.\textsuperscript{85} This, although to a lesser extent, also holds in subsidized systems.\textsuperscript{86} The National Dental Insurance System in Sweden was introduced in 1973 and
has changed a number of times since. The relative cost for implant treatment within the Swedish subsidised dental health care system did not decrease during the ten year study period, but rather increased to some extent. Income did not change as an important gatekeeping factor between the two questionnaire study occasions. Another study indicates that cost is estimated as too high by three-quarters of the interviewees.\textsuperscript{66} They were, though, uninformed of the actual cost. Yet another study showed that patients who had undergone implant treatment deemed the cost to be reasonable to a large extent.\textsuperscript{91}

**Trust in the dentist**

The patients’ trust and confidence in the dentist and his/her staff is very important in the process of transforming desire for dental implant treatment into a manifest demand, and in making it more likely for the patients to become satisfied with the treatment result regardless of complications. Mutual discussions in the treatment planning process, primarily good pre-treatment information, and accurate cost estimation were reasons for developing this trust and confidence. Experienced complications like disintegrated implants were not considered as a result of bad management from the dentist. Instead, the participants put the blame on themselves.

None of the two identified gatekeeping factors, cost, and dental anxiety, were reported as important for the decision of getting implant treatment by the treated patients in study V.

A great improvement/recovery in oral health related quality of life was stated in terms of regaining the feeling of self-esteem and being secured in social relations. The ability of sensing different food tastes was also regained after implant treatment and the perception of the implant supported fixed denture was the same as of own natural teeth.

Both a study of Trulsson (Hallberg) et al,\textsuperscript{41} and the present study show how informants with removable dentures developed avoiding strategies in order to ensure that no one would notice the denture. In order to manage uncertainty, they often avoided social contacts, especially when eating. These avoidance strategies contributed to restricted social participation and a change in self-image.
The grounded theory study revealed the importance of the patient’s trust in the dentist as the core category and main finding. This trust seems to be vital for the patient’s choice, acceptance and completion of the treatment, also making the patient more likely to be satisfied with the treatment result. This expression of trust in the dentist was common even from those informants who had experienced complications. There is a possibility that the results from this study could be applicable to a wider context. However, patients who were unable to be successfully treated with fixed implant prosthesis were not included, nor were informants who had to pay the full cost of the treatment.

The result in this study differs from the results of another qualitative study that showed that patients with chronic periodontitis stated that they had to depend on the care provider independently, whether they agreed to the treatment plan or not. The patients also had difficulties to foresee the result of the treatment. The result in this study differs from the results of another qualitative study that showed that patients with chronic periodontitis stated that they had to depend on the care provider independently, whether they agreed to the treatment plan or not. The patients also had difficulties to foresee the result of the treatment. A conclusion from that study was the importance of giving thorough information about the planned treatment and to give much attention to the patients’ individual needs. In our study, the informants described information regarding treatment and costs as very good, and also that the thorough individual preparation before treatment gave a deep trust in the dentist and the staff.

The differences in these studies can depend on several factors, besides the possible difference in information and mutual discussion pattern. The trust in the dentist could also be the result of a long treatment period and long treatment sessions, which most often is the case in implant treatment. This has in other studies been shown to have an impact of the patients’ relation to the dentist and to the experience of the treatment result. The possibility to freely discuss the treatment options, and to be given the opportunity of talking about psycho-social factors, has previously been put forward as important for the subjective opinion of the prosthetic treatment. The patient panorama could also be somewhat different in our study with implant treatment patients compared to the other study with patients with a periodontal disease. The treatment outcome could also in many implant treatment cases be more easily described, with a higher degree of prognostic accuracy, than for periodontal disease.
The oral-facial aesthetics seems to be definitely more important than good dental function for some of the informants, which also has been described in other studies. Patients expressed that their self-esteem and self-confidence were severely depressed by having tooth gaps, even when they were only visible for themselves. This is in accordance with another study, where the eventuality of losing a tooth or getting dentures was compared to being unemployed. The informants in our study described the feeling of being restored and regaining self-esteem when they once again got fixed teeth.

Gatekeepers expressed by the informants
The informants in the interview study, who were already treated, were asked if there were any obstacles, gatekeepers, in the decision making process. The two factors mentioned were cost and dental anxiety, but neither was described as important. Two of the informants had hesitated to choose implant treatment because of the cost, but had all the time been determined to carry through with the treatment later.

However, a new regulation was introduced in the National Dental Insurance System in Sweden a few years ago. The regulation permitted highly subsidised treatment costs for prosthodontic services. The cost for dental implant therapy is therefore low in an international perspective. It is likely that this might have an impact on the desire of implant treatment although most of the informants declared that they would desire this treatment regardless of cost and were prepared to take a bank loan, if necessary. The participants in this study were referred to a specialist clinic with the pronounced intention of having dental implant treatment. They were to some degree prepared for the cost and the different parts of the treatment. Those without the economical resources had probably declined the offer of referral. As pointed out in another questionnaire study, treated patients seem to consider the cost worthwhile. Maybe only patients with good economic resources carry through the implant treatment, or treated patients may consider their quality of life being so much enhanced that they consider the money well spent.

The opinion that the total cost was not as high as they thought was unanimous for all the informants in our study. The pre-treatment cost estimation showed to have good accuracy which strengthened
the confidence in the dentist and his/her staff. A weakness of the
study is that these patients had passed the gatekeeping process
and expressed demand. A study of needy patients not demanding
implant treatment would be of great interest but outside the scope
of this study.

Some of the informants described having dental anxiety previously
but had gone through with the treatment without hesitation because
of the pre-treatment information which was considered very
accurate.

Cost and dental anxiety have earlier been discussed as important
gatekeepers. Perhaps this is the case for many dental treatments
options, but not so for this study group. When asked if they knew of
any friends or acquaintances that had declined from implant treatment
because of cost or dental anxiety, there were few such cases. Still,
the gatekeeping may occur long before contact is taken with dental
care, which of course is not perceived in the care system, even less
so in a specialist clinic. A recent two centre qualitative study among
elderly persons two main themes emerged as gatekeepers; patients’
fear and anxiety (relating to the pain of surgery, complications of
the procedure and immediate post-surgical denture use), and the
appropriateness of the procedure in an elderly person.84 The impact
of cost was not included in this study. Compared to our study, this
could partly depend on age and cultural differences (appropriateness
for an elderly person). Our study group was younger and perhaps
implant treatment is more commonly accepted treatment option in
Sweden, regardless of age. Another reason for difference could be that
the informants in our study were treated patients and had concluded
their decision making process, and the reported confidence in their
dentist made dental anxiety a minor concern.

Another study has claimed that implant supported fixed dentures
makes the patient regain health and function to a higher degree than
with fixed partial dentures or removable dentures.97 The results in
our study confirms this.

This is also in line with yet another qualitative study regarding
eating, indicating that implant supported mandibular overdentures
gave a significant improvement compared to informants with
adjusted prostheses.98 The informants in our study unanimously
declared the feeling that implant supported fixed partial dentures felt
better than a conventional fixed partial denture and was comparable to their own natural teeth.

Everyone in the study group who had used a removable denture (all but one), reported a decrease of the ability to sense food tastes because of the dentures. This effect of the removable denture was considered as a clear decrease in quality of life. After receiving the implant supported fixed denture, the ability of sensing food tastes was regained.

The percentage of elderly individuals without teeth and wearing removable dentures has dramatically decreased in Sweden during the last decades.\textsuperscript{99} On the other hand, there is today a larger share of the population getting older, and they will probably face the risk of losing their teeth at a higher age. This is also proposed to be the case in other parts of the industrialized world, e.g. in the United States.\textsuperscript{100} This means that in a foreseeable future, there may be many patients with dentures desiring implant supported dentures.

In line with the results from the present and other studies, it should be politically urgent to make it possible for those of the denture wearers who cannot accept their denture, to have the opportunity to get subsidized dental implant treatment within the national insurance system.
CONCLUSION

The core category and main finding were the importance of the patients’ trust and confidence in the dentist and his/her staff in the process of transforming desire for dental implant treatment into a manifest demand, and also in making it more likely for the patients’ to become satisfied with the treatment result regardless of complications. Mutual discussions in the treatment planning process, primarily good pre-treatment information, and accurate cost estimation were reasons for developing this trust and confidence.

Need, from a conceptual analysis, is constituted in the society, and in the interaction between patient and dentist. Need does not always lead to demand for treatment, nor to utilization, depending on the gatekeeping processes between need and demand, and between demand and utilization. These processes are influenced by numerous factors such as education, occupation, income, individual preferences, costs, cultural differences, psychosocial factors, comfort, age and accessibility of services. Patients with a higher level of education, and higher income have a lower gatekeeping barrier than less wealthy individuals and those with a lower level of education.

If expensive prosthodontic treatments are made financially available for all individuals by means of subsidies, this could influence and change the existing need and create a new need among the population. In the prosthodontic treatment decision-making process, the emancipatory perspective with the patient-dentist dialogue is of utmost importance to achieve an optimal treatment result. The professional attitude toward need must be that there is no true objective nor subjective need. Oral health is estimated
through dialogue and professional assessment. Need is established in communication with mutual respect between the profession and the patient.

Demand must be accepted through the knowledge that there is no objective need and that demand depends on the patient’s opinion. In accordance with this, changes in demand and utilization must be accepted and considered when prosthodontic treatment options are discussed and evaluated. Prosthodontic treatment is highly individual and not immediately related to oral health status, making need and demand difficult to measure in that respect. Therefore, socio-dental factors should be included and evaluated in studies on need and demand and utilization regarding prosthodontic treatment.

This thesis shows that almost all in the study panel expressed desire for implant treatment in 1999, which is a major increase in interest compared with the findings in the 1989 questionnaire. Individuals with a possible treatment need showed a great change in desire for implant treatment pointing out that when an individuals’ need turns from latent to manifest, the treatment desire changes even more. Manifest need and desire for implant treatment most likely changes over time. Factors influencing desire for implant treatment are income and dental status. Age, place of residence, and concern for dental appearance did no longer influence desire for implant treatment at the end of the studied 10-year period. Individuals with removable dentures, or those being edentulous in one or both jaws had a lower probability to desire implant treatment than those with all teeth remaining, or with missing teeth replaced by fixed partial dentures.

Cost is the major gatekeeper for not expressing desire for implant treatment. Costs, and uncertainty about risks and physical and technical prerequisites, are among the factors that apparently could influence the patient’s choice of prosthodontic treatment.

The interview study confirmed much of the stated facts from the other studies but also revealed new facts not possible to achieve from the questionnaires.

Experienced complications like disintegrated implants was not considered as a result of bad management from the dentist. Instead the participants put the blame on themselves.
All of the informants had considered implant treatment for some time and made their decision when they felt confident in the dentist and after discussions with their family and with the dentist.

None of two identified gatekeeping factors, cost and dental anxiety were important for the decision of getting implant treatment. No other gatekeeping factors were put forward by the informants in the qualitative interview study.

A great improvement/recovery in oral health related quality of life was stated in terms of regaining the feeling of self-esteem and being secure in social relations. The ability of sensing different food tastes was also regained after implant treatment and the perception of the implant supported fixed denture was the same as of own natural teeth.
ACKNOWLEDGEMENT

I wish to express my sincere gratitude to all those, that in different ways, have helped me in these studies throughout the years. In particular I wish to express my thanks to:

Professor Björn Söderfeldt – thank you for always being a most helpful and supportive primary supervisor, co-author, and advisor. Your support has been total and there are no words for the significance of your guidance.

Professor Sigvard Palmqvist – thank you for giving me the opportunity of becoming a prosthodontist and also your sincere support in my research, and for generously given me advice that has helped me very much in my work.

Associate professor Mats Kronström – thank you for giving me the chance to get into the world of research and science, and your invaluable way of supporting me in the beginning of the work with my studies.

My co-author Ingrid Collin Bagewitz – thank you for your consistent help with my papers, and for your scrupulous reading and valuable opinions, and for sharing your knowledge of adequate references.

My co-author Ulrika Hallberg-Asklund – thank you for helping me into the world of qualitative research and your generous way of supporting me in my article. You have made me realise how exciting qualitative research is.
Folktandvården Uppsala län with Director Eva Ljung, Associate professor Pia Gabre and Professor Lars Gahnberg – thank you for the support through the years and for giving me the possibility to carry through this project with funding and your personal support.

Folktandvården Örebro – thank you for supporting the questionnaires conducted by Professor Sigvard Palmqvist.

Professor Karl Ekstrand – thank you for letting me spend time in the beginning of my research and for always being anxious of pointing out the importance of conducting research.

My colleges, co-workers and friends at Kaniken and especially Carina Forsberg – thank you. This would not have been possible without you.

My friend and colleague Alf Eliasson – thank you for always helping me out, whenever I have been puzzled with patients or in my research.

Professor Krister Nilner – thank you for your important opinions on my papers and how to conduct research.

Professor Ann Wennerberg – thank you for giving me the opportunity to fulfil this thesis.

Mr Alborz Soltani – thank you for all your kind help and support.

Dr. Maj-Britt Folkunger Sällvik – thank you for giving me a role model helping me in many parts of my daily work.

My family: Åsa, Petter, Cecilia, Ylva. Thank you for being there. All my love.
REFERENCES:


The concepts of need and demand are central in studies on dentistry. Need has been defined as “the quantity of dental health care which expert opinion judges ought to be consumed over a relevant time period, in order to remain or become as dentally healthy as is permitted by existing knowledge.” However, such a definition gives little attention to the individual’s personal comfort and quality of life. Furthermore, it requires knowledge about the individual’s dental health situation, available treatment options, and exact definitions of what should be regarded as “dentally healthy.” The decisive argument against such a definition is that it gives the power to decide need to someone other than the person who has the need. Thus, it contradicts the whole idea of “patient empowerment,” which is the central tenet of modern health theory.

Need, however defined, does not always lead to demand for treatment, depending on a variety of factors. Need and demand for prosthodontic services are difficult to measure, as prosthodontic treatment is highly individual and not closely related to edentulousness. Need, however defined, does not always lead to demand for treatment, depending on a variety of factors. Materials and Methods: The present article is part of a larger study in which the intention is to evaluate need and demand for prosthodontic treatment among the participants in a 1989 and 1999 longitudinal study of a population sample. As the first step, this article reports a conceptual analysis of the need concept from the literature. Results: Need is stated as socially established in the interaction between patient and clinician. It makes demand dependent on available treatment options from the care provider and society. In the prosthetic treatment decision-making process, the emancipatory perspective with the patient-clinician dialogue is of utmost importance to achieve an optimal treatment result. Conclusion: The professional attitude toward need must be that there is no true objective or subjective need. Need is established only in a communicative dialogue with mutual respect between the professional and the patient.

Purpose: The concepts of need and demand are central in studies on dental care. In the literature, a normative definition is often used, but it pays little attention to the individual’s personal comfort and quality of life. Need and demand for prosthodontic services are difficult to measure, as prosthodontic treatment is highly individual and not closely related to edentulousness. Need, however defined, does not always lead to demand for treatment, depending on a variety of factors.

Materials and Methods: The present article is part of a larger study in which the intention is to evaluate need and demand for prosthodontic treatment among the participants in a 1989 and 1999 longitudinal study of a population sample. As the first step, this article reports a conceptual analysis of the need concept from the literature. Results: Need is stated as socially established in the interaction between patient and clinician. It makes demand dependent on available treatment options from the care provider and society. In the prosthetic treatment decision-making process, the emancipatory perspective with the patient-clinician dialogue is of utmost importance to achieve an optimal treatment result. Conclusion: The professional attitude toward need must be that there is no true objective or subjective need. Need is established only in a communicative dialogue with mutual respect between the professional and the patient.

Correspondence to: Birger Narby, Department of Prosthetic Dentistry, Public Dental Health Service, Uppsala, Sweden. Mats Kronström, Department of Prosthetic Dentistry, Malmö University, Sweden; and Department of Dental Clinical Sciences, Faculty of Dentistry, Dalhousie University, Halifax, Canada. Björn Söderfeldt, PhD, DrMedSc, Department of Oral Public Health, Malmö University, Sweden. Sigvard Palmqvist, DDS, PhD, Odont Dr.
Defining Oral Rehabilitation Need: Part 1

A need for medical care exists when an individual has an illness or disability for which there is an effective and acceptable treatment or cure.17 Still, the concept of an illness or disability for which there is an effective and acceptable treatment or cure is rarely met. The present study performed a conceptual analysis of the need concept from the literature; a forthcoming survey will focus on the gatekeeping processes between need and demand and between need and utilization of dental treatment.10–12

Widening Definitions of Health and Need

Needs have been described as states of a client that create a requirement for care,13 which gives a potential for service but does not always lead to service, and use of services does not always come from need. This transformation of need into use of service is complex. There is, furthermore, the possibility that providers of health care, as dentists, also bring their own needs, wants, and demands to the clinical situation, and that this may have an important impact on the utilization of care.14 The most self-evident need felt by a physician in relation to patients is the need to make sick people well or, for a dentist, to rehabilitate people with poor dentition or occlusal disturbance. A common image of a rational clinician is that of someone who always performs sophisticated treatments.15 To separate the clinician’s own needs, wants, and demands from the clinical decision-making process will, to some extent, give clues to which treatment is provided. It has also been suggested that economic incentives exist for the care provider to exaggerate or minimize needs in the patient.16

A definition including effectiveness of treatment, often used in evidence-based medicine,1 suggests that, “A need for medical care exists when an individual has an illness or disability for which there is an effective and acceptable treatment or cure.”17 Still, the concept of need can be analyzed further.

Does Human Need Exist?

The concept of need belongs to the social sciences, where many suggestions differ from the relatively unan- imous medical traditions. There is still no generally accepted method for measuring human welfare because of the difficulties of defining human needs. Moreover, human needs have been considered to be relative rather than a generally applicable concept.18 If need is defined by professionals, this simply pits one subjective opinion— the professional’s—against another subjective opinion—the patient’s. In a conflict situation, the strongest party prevails, usually the professional. A subjectivist and relativist conception of need therefore inevitably gives a disadvantage to those who are too weak, old, or sick to express their own needs, precisely those persons whose needs the professional should try to meet.

Objective Need

There are theories suggesting that objective needs do exist, and that the most important attributes are physical health and autonomy.18 Autonomy is impaired when there is a deficit of three attributes: mental health, cognitive skills, and opportunities to engage in social participation.

There are other, simpler attempts to define objective needs, and one theory suggests a hierarchy of needs in which the most basic needs must be met before needs higher in the hierarchy can be actualized.19 This implies that health needs must be satisfied before autonomy, as the need for health is a condition for subsistence.

Taxonomy of Need

A taxonomy of need was presented in 1972 by Bradshaw,20 who divides need into four separate definitions:

- **Normative need** is that which the expert or professional defines as need in any given situation. A “desirable” standard is decided and compared to actual circumstances; if an individual or group falls short of the desirable standard, they are identified as being in need. This is reminiscent of the objectivist idea of need.
- **Felt need** is equated with want expressed after self-assessment by the individual or population; it is thus a subjectivist idea of need. A study of prosthodontic treatment need showed that subjective need without a normative need is rare.21 In only one third of the studied treatments did normative and subjective need coincide; normative need was significantly higher. The discrepancy between normative
and subjective need is in accordance with other reports.  
- **Expressed need** is equivalent to demand, ie, felt need turned into action.  
- **Comparative need** is assessed by studying the characteristics of a population using a service; if there are people with similar characteristics not receiving service, they are in need. This definition has been used to assess needs of both individuals and areas. In the empirical parts of the present study, such a need conception was used.

Sheiham and Spencer have analyzed normative need as being a commonly used type of need assessment in dental health planning. However, by using normative need, diseases are identified without considering the subjective perception of the patient and the relevance to the disease-oriented or biomedical approach. Sheiham and Spencer find four major shortcomings of normative need.

First, professional judgments are neither free of individual valuation nor objective. There is intra- and interexaminer variability in judgment and decision making. Variables such as age, practice beliefs, and price competition in the marketplace have effects on treatment. For example, many young clinicians in Sweden today have little or no experience in complete denture treatment, unlike general practitioners a few decades ago, which could lead to avoidance of proposing such treatment options because of lack of experience.

Second, the normative need defined by clinicians does not necessarily correspond to the experienced need of the patient. Patient satisfaction is not always related to the clinical assessment, and, for example, lack of posterior teeth leads to demand for prosthodontic treatment in only some situations. Both type and quality of the treatment are important, but not decisive for patient satisfaction, although there is a relationship between health-related quality of life measures and clinical oral indicators.

Third, there is not always correspondence between political and professional need assessment. An example can be found in the Swedish National Dental Health Insurance System, in which persons aged 65 years and over receive a highly subsidized part of the total cost for prosthodontic treatment, irrespective of their dental health or paying ability. This was a purely political decision without professional support.

Fourth, there are not always resources to meet a normative need. All dental needs cannot be met. The need definitions depend on realistic treatment possibilities. Economic subsidies make new treatments available. Need perceptions and demand grow rapidly, which points to another conception of need, so-called “emancipatory need.”

**Emancipatory Need**

Need and demand are constituted in a dialogue between the patient and professional in which the professional should discern latent needs that are relevant but may be subconscious or unexpressed. One can distinguish between manifest and latent needs. A treatment need becomes manifest when new treatment alternatives emerge, as with, for instance, dental implant treatment. Perceived need is dependent on the credible opportunities to meet the need. A professional way of dealing with latent and manifest need is through dialogue, which is the emancipatory perspective.

Especially in prosthodontics, there are legitimate claims for dialogue, and an ordinary decision-making process should also involve the patient. Prosthodontics is not a specialty dealing with treatment of an oral disease, but rather the branch of dentistry that focuses on oral reconstruction from a functional and esthetic point of view.

Evidence-based dentistry is considered the foundation of modern health care, but it is not the only method to be considered in prosthodontic treatments. Any evidence-based therapy must be used with care, as the treatment plan must be based not only on available treatment options, but also on the individual’s need. Therefore, evidence-based therapy cannot be conclusive. Studies show considerable differences in how clinicians approach treatment alternatives and decide what the best option is. It has also been shown that patient satisfaction and need fulfillment increase if the patient is personally involved in the treatment planning process.

In some situations where patients have dental needs the professional cannot diagnose or satisfy, the need could be projections of discontent with situations or general conditions of life. Thus, dysmorphophobia is an example in which dialogue is central in dealing with the problem of jointly trying to decide actual dental need.

**Conclusion**

Oral health is estimated through dialogue and professional assessment. Need is constituted by society and the interaction between patient and clinician. It makes demand dependent on available treatment options and resources from the care provider and society. If expensive prosthodontic treatments are made financially available for all individuals by means of subsidies, this could influence the existing need and create a new need among the population. In the prosthodontic treatment decision-making process, the emancipatory perspective with patient-clinician dialogue is of utmost importance to achieve an optimal treatment result.
Defining Oral Rehabilitation Need: Part 1

professional attitude toward need must be that there is no true objective or subjective need. Need is established only in communication, with mutual respect between the professional and patient.

Appendix

Search Strategy

A literature survey was done by applying the PubMed database. PubMed provides access to bibliographic information that includes MEDLINE, covering the fields of dentistry, medicine, nursing, veterinary medicine, the health care system, and the preclinical sciences. The search was continued in MEDLINE and PsycINFO. The survey covered the period from 1994 to August 2002 and used the Medical Subject Heading (MeSH) terms:

need OR demand OR attitude OR requirement;
prosthodontics OR dental implants OR dentistry OR dentists;
combination (1) AND (2)
limits: English, human

The search strategy resulted in 509 articles, of which 147 abstracts were collected from articles with an approach to dentistry or concentration on conceptual analysis of the MeSH terms in the first selection group. Furthermore, a hand search of the references in these papers was undertaken to find more articles of special interest.

Selection Criteria

Papers were excluded if the studies they reported did not have an approach to the patient’s needs, demands, and attitudes.

Acknowledgment

This study was supported by The Public Dental Health Service, Uppsala County Council, Sweden.

References


The International Journal of Prosthodontics
Group function or canine protection

The study tested the effect of group function and canine protection on general chewing patterns, as well as movement in the terminal part of the chewing cycle. Five subjects were restored with implant-supported fixed complete dentures for the maxilla, and natural dentition or fixed restorations for the mandible. LEDs (Selspot system) were used to register the chewing patterns. The light signals were recorded by camera and analyzed in a computer. Canine protection occlusal scheme was given to the subject. The first registration was performed after 4 months. Then the occlusion was modified to group function, and a second registration was made five months later. Only two test subjects were able to attend the third occlusal registration when the occlusal scheme was changed back to canine protection and registration was made 6 months later. There were several findings between the two occlusal schemes: 1. The angle of departure was steeper than the angle of approach for the canine protection occlusion, but there was no statistical difference between these angles in the group function occlusion; 2. The mean maximal lateral shift and mean total mandibular movement at opening and closing during chewing of test bread were all greater with group function occlusion than with canine protection; 3. The mean maximal mandibular velocity was greater with group function occlusion then with canine protection; 4. The variations in three dimensions at the most cranial position were mostly greater with group function than with canine protection; and 5. The duration of the chewing cycle was stable intraindividually between two registrations.


Risk indicators for posterior tooth fracture

This case-control study of risk indicators for posterior tooth fracture evaluated 39 potential risk indicators. A total of 200 patients, each with one fractured tooth, and 252 patients (749 control teeth) without fractures were recruited from a large dental group practice in Portland, Oregon. Clinical examinations and patient surveys were carried out to obtain information on the list of potential risk indicators. Clinical examinations were carried out prior to any treatment to collect information on the fractured tooth and comparison tooth, eg, mobility, Class V restorations, cervical defects, craze lines, tactilely detectable fracture lines, subsurface discoloration, endodontic access preparations, restorative material, restored surfaces, tooth-supported partial denture, and canine or group guidance. Relative volume proportion between restorations in the tooth concerned was also calculated. Patients completed a 14-item questionnaire to allow the study to elicit demographic data, information about behaviors, experiences, and symptoms that may be associated with tooth fracture. For control subjects, a minimum of two restored teeth of the selected tooth type that were uncrowned was used. Logistic regression (backward-selection method) was used to develop models identifying risk indicators associated with fractures between case and control subjects, as well as between case and comparison teeth in case subjects. Two risk indicators were strongly associated with cusp fracture in both models (P < .001): presence of a tactilely detectable fracture line and the proportional volume of the restoration.

Bader JD, Shugars DA, Martin JA. J Am Dent Assoc 2004;135:883–892. Reference: 21. Reprints: Dr James D. Bader, Department of Operative Dentistry, School of Dentistry, CB#7450, University of North Carolina, Chapel Hill, NC 27599-7450. e-mail: jmbader@unc.edu—Alvin G. Wee, Columbus, OH
To correctly assess a patient’s oral health, both a clinical examination and a dental history obtained through dialogue are necessary. Traditionally, poor oral health has been regarded as a component of treatment need, but such need is also socially constructed and established in the interaction between patient and clinician. Perceived need may depend on access to treatment options, technologic possibilities, social norms, and attitudes among both care providers and patients. In the prosthodontic decision-making process, the emancipatory perspective with the patient-clinician dialogue at the forefront plays a central role in achieving optimal treatment results.

A conceptual analysis of need has previously been reported. It is also important to examine how need may transfer into demand and the mechanisms involved in such a process. The concept of gatekeeping has been identified as the social and psychologic processes that transform need into demand and demand into utilization. It implies that they are complex processes that can render great differences between demand and actual utilization.

Conclusion: It is not possible to estimate a patient’s needs for prosthodontic care, since there is no objective need. Demand and utilization are factors that play an important role in the gatekeeping process. These factors are dependent on the patient’s opinion, which is influenced by numerous factors. Int J Prosthodont 2007;20:183–189.

**Purpose:** Patients’ oral health needs are estimated through dialogue and professional assessment. The concepts of need and demand are vital to studies of dental care and oral health. Need does not always lead to demand for treatment or to utilization, depending on the gatekeeping processes between need and demand and between demand and utilization. Demand must be accepted with the understanding that there is no objective need and that demand depends on the patient’s opinion. In accordance with this, the need for prosthodontic treatment is highly individual and is not automatically related to oral health status, making need and demand difficult to measure in that respect. Therefore, sociodental factors should be included and evaluated in studies of need and demand for utilization of prosthodontic care.

**Materials and Methods:** This theoretical and analytic paper focuses on the gatekeeping processes between need and demand and between demand and utilization of prosthodontic care. Results: The concept of gatekeeping refers to the social and psychologic processes that transform need into demand and demand into utilization. It implies that they are complex processes that can render great differences between demand and actual utilization.

Conclusion: It is not possible to estimate a patient’s needs for prosthodontic care, since there is no objective need. Demand and utilization are factors that play an important role in the gatekeeping process. These factors are dependent on the patient’s opinion, which is influenced by numerous factors. Int J Prosthodont 2007;20:183–189.
Gatekeeping

The process between need and demand is influenced by several factors, identified as barriers or gatekeepers (Fig 2). Need can be regarded as latent or manifest. Becoming aware of a latent need, which eventually becomes manifest, is a multifactorial process that involves:

- Oral health and edentulism
- Quality of life and perception of need
- Psychologic factors (e.g., dental anxiety state)
- Health beliefs (attitudes, values, and behavior)
- Social structure (education, occupation, and ethnicity)
- Demographics (age, gender, marital status, and income)

The process between demand and utilization of dental services (Fig 3) is closely related to social and economic factors, which can act as inhibitors in the process between a demand and utilization of this demand. Gatekeeping mechanisms have been used to control the costs of care and to promote cooperation between different groups of care providers.6

Prosthodontic treatments are often associated with a high cost for the patient. Supplier-induced demand and dental insurance schemes are factors of interest in that respect. The aim of the present paper is to analyze the gatekeeping mechanisms with respect to the patient, to different treatment options, and to service utilization.

**Gatekeeping 1: Between Need and Demand**

**Oral Health: Complete and Partial Edentulism**

Edentulous patients with denture problems do not necessarily translate such concern into demand for treatment.7 Most edentulous individuals adapt to wearing complete dentures; however, for some, impaired oral health resulting in loss of the natural dentition is a serious life event and has been compared with other stressful events such as divorce or retirement.8 It can be experienced as a mutilation or a serious change of life.9 A greater concern about demand is a consequence of the realization that there is no objective need. Still, in most cases demand must be recognized as the result of an actual need. There are, of course, financial aspects involved in the process related to need and demand for prosthodontic treatment, and it is well known that edentulism is more prevalent among individuals with low or no income.

Need and demand for prosthodontic treatment among partially edentulous individuals are even more difficult to estimate. A missing maxillary anterior tooth is a strong incentive for demanding treatment, while loss of a posterior tooth usually is not. Position and number of teeth have strong effects on the perceived need for prosthodontic treatment.10 11

The results of the replacement of lost teeth with removable dentures are contradictory, indicating that demand is dependent on the patient’s opinion.12 It has been shown that about 25% to 50% of individuals who have...
removable dentures seldom or never use them. Cost seems to play an important role here, and there is a higher probability of low dental care utilization among those who consider dental care as expensive compared to those who state that they have no problem with the cost. The shortened dental arch (SDA) concept, first introduced by Käyser and Witter et al., is becoming widely accepted among many dental practitioners, as it seems to reflect the actual perceived demand among most partially edentulous individuals. The principles of the SDA concept include different levels of functional needs in relation to age and other individual factors. It further implies that teeth should be replaced only when there is a demand to restore essential functions, such as esthetics, oral comfort, and occlusal stability. With this concept, limited treatment goals can be achieved and still satisfy patient demands.

Quality of Life

Oral quality of life (QOL) includes freedom from pain and optimal oral function and dental appearance. Subsequent studies of elderly individuals found significant relationships between oral health status and QOL as well as between self-esteem and perceived oral health status. The introduction of dental implants has revolutionized prosthetic dentistry, and reports indicate that increased patient satisfaction and perceived QOL are strongly associated with the use of dental implants.

Psychologic Factors

Four main groups of psychosocial factors have been identified as potential barriers between need and demand: (1) dental anxiety, (2) perception of need, (3) financial concerns, and (4) lack of access. The latter factors belong mainly to the gatekeeping process between demand and utilization. Concern about oral health has been reported as significantly predicting perceived treatment need. Individuals who regularly attend a dental office are likely to have a much higher perceived need than irregular attendees. Barriers such as fear of pain, anxiety, cost, and long waiting times have been found to have little influence, but the clinician’s recommendation was found to be important. Dental anxiety is one of the major parts of the psychologic barrier between need and demand. It appears to be dependent mostly on experiences from youth, but some patients might use it as a pretext not to meet a demand because of a poor economic situation.

Health Beliefs

Healthy teeth are important to most people regardless of age. Dissatisfaction with appearance has been found to be a major reason for transforming need into demand. New adhesive techniques with veneers and all-ceramic restorations require minimal tooth preparation. The increasing commercialization of body image and changes in social normative standards have resulted in subjective demand for cosmetic dental care, so that practitioners may have difficulty identifying patient need. However, the demand for cosmetic dental care varies in different age groups and in different cultures. Expectations of dental health status and dental care may vary between individuals with different social norms and cultural traditions. In some ethnic and social groups, edentulism following dental disease is considered as a likely development and a natural part of life.

Social Structure and Demographics

There seems to be a gender variation in the social impact of oral health on perceived QOL. Women reportedly consider oral health as more important, whereas men rank chewing ability higher. But there are also contradictory reports regarding the need for prosthodontic services in men versus women. Edentulism may be correlated with age and gender and is also more prevalent in rural areas, whereas there seems to be a greater demand for treatment in more densely populated areas. There are also contradictory reports regarding the need for prosthodontic services in men versus women. Factors such as ethnicity, cultural attitudes, and standard of living have an impact on need and attitudes toward dental care, where, for instance, citizens in urban Western societies have a much higher level of demand for treatment than patients in less developed countries. Individuals with high levels of education, prominent occupations, and high incomes have a lower barrier to treatment demand compared with those with a low level of education and reduced financial capacity. It is likely that global internationalization and growing prosperity may change the need for dental treatment, and through changes in the gatekeeping process, new demands may be developed. Moreover, technical achievements in the field of prosthetic dentistry may also contribute to a change in demand among individuals.

Gatekeeping 2: Between Demand and Utilization of Dental Treatment

Explanatory Models of Utilization

Originating from models of health service utilization, several explanatory models for utilization of dental care have been put forward. A sociologic comprehensive conflict model from Petersen emphasizes 6 groups of explanatory factors to explain inequalities in dental health.
1. **Background factors** comprising experiences in the public dental service for children. There are associations between poor dental conditions and poor social conditions.11 It has also been shown that there is a great amount of variation between general practitioners regarding prosthodontic services. About 20% of the variation in prosthodontic service rate was related to the clinician and not to the patient; factors related to the clinician, such as gender, age, years in the profession, and prosthodontic production, seem to have a great impact on the clinician’s choice of prosthodontic treatment.46 The clinician’s medical or ethical consideration of a patient’s demand will sometimes affect the gatekeeping process, resulting in no treatment.

2. **Socioeconomic factors** comprise work and living conditions and social norms and values.47 Low education and advancing age have strong correlations with few remaining teeth, and the prevalence of removable dentures indicates socioeconomic inequality in dental conditions.48 Social differences in dental care utilization are related to treatment costs and attitudes toward cost.11

3. **Individual factors** comprise dental visit habits, attitudes, and opinions regarding teeth and dental care.49,50 The introduction of a subsidy system normally increases utilization.51 In a system with limited dental manpower capacity, there may be a risk that patients may not receive adequate care, especially those who require extensive prosthodontic treatment.

**Oral Health and Service Utilization**

Utilization is conceived as the received amount of care; the most common measure is the annual number of dental visits per person. Usually, there is a presumption that a high level of utilization in a population has a positive correlation with oral health.27,32,52 Other studies suggest that dental treatments may be performed as a result of iatrogenic injuries and are also related to the so-called supplier-induced demand.53 Oral health is also likely to affect utilization in a reverse relationship, meaning that good oral health is closely related to a high level of utilization of dental services.55 Several studies indicate that edentulism per se is related to a low level of utilization.56-58 Extensive prosthodontic treatments will require maintenance. The need for maintenance is usually higher for removable prostheses than for fixed prostheses, and several studies indicate excellent long-term survival rates following treatment with fixed prostheses.59-61

**Socioeconomic factors.** Social and economic factors can influence the process between recognition of a demand and utilization of this demand. There is evidence that national economic recession, to some extent, affects utilization of dental services.62 In countries with public health care systems, accessibility and financial aspects are important factors for utilization.63,64 Individuals with low income have a lower level of utilization and spend less money on dental care compared with individuals with higher income, even in subsidized systems.65

**Cost and supplier factors.** Cost is the most frequently mentioned barrier regarding utilization of dental care, but there is evidence that free or reduced-cost services increase utilization only slightly.66 However, dental care utilization could be related to attitudes toward costs.11 Refraining from dental care because of the high cost may negatively affect the self-image of individuals who have a perceived need because of poor dental health.15 Dental insurance schemes have a positive influence on attitudes and motivations for dental services and therefore could increase utilization of dental services.51 However, the use of dental services is also influenced by socioeconomic factors, and insurance schemes may play only a limited role in changing this.67,68 Individual factors such as attitudes and opinions regarding teeth and dental care, as well as dental anxiety, might in many cases have a greater influence on demand and utilization. Treatment fees seem to have a greater impact on utilization than on demand.67,68

However, an example of the reverse situation was seen when a new regulation was introduced in the National Dental Insurance System in Sweden a few years ago. The regulation permitted highly subsidized treatment costs for prosthodontic services and included only patients age 65 and older. The demand and utilization for extensive conventional fixed and implant-supported prosthodontic treatments increased dramatically, and the cost of the new regulation was 3 times higher than estimated. It seems that demand and utilization in this case were highly dependent on actual costs.

One would have expected that the traditional gatekeeping process between need, demand, and utilization changes quite dramatically in a situation in which patients, through a subsidized system, are given the financial capacity to choose a treatment and meet a patient need. The clinician’s role in a highly subsidized dental health care system should also be considered because of the risk of supplier-induced demand, ie, overconsumption of medical services generated by the economic self-interest of physicians. This has also been discussed with regard to dental services.69-70

Private practitioners and dental clinicians employed in...
the Public Dental Health Service have different incentives. It has been shown that the type of care organization influences both utilization and cost of care, resulting in higher costs and more frequent utilization for those attending private care.

Dental insurance. The lack of dental insurance is one of several obstacles in obtaining oral health care and accounts in part for the generally poorer oral health of individuals with reduced financial capacity. More dental treatment is performed in patients with comprehensive dental insurance when compared to a population with similar income, age, and gender but with less extensive insurance plans, although regular attendance at appointments does not necessarily indicate good dental health. Another important factor is whether the dental insurance covers all kind of treatments or not. If only some treatments are included, this tends to result in treatment that does not meet the needs and demands of the patient. Implant treatments, for example, are not fully recognized by insurance companies worldwide as a standard of care in the treatment of the edentulous or partially edentulous patient. The quality and long-term prognosis of prosthodontic treatments seem to be unaffected by whether the treatment was performed within a system with high-cost protection or not.

Conclusion

Patients' oral health need is estimated through dialogue and professional assessment. Need does not always lead to demand for treatment or to utilization, depending on the gatekeeping processes between need and demand and between demand and utilization. These processes are influenced by numerous factors, such as education, occupation, income, individual preferences, costs, cultural differences, psychosocial factors, comfort, age, and accessibility of services. Patients with higher levels of education, more prominent occupations, and higher incomes have a lower gatekeeping barrier than less wealthy individuals and those with lower levels of education. Demand must be accepted while taking into account the knowledge that there is no objective need and that demand depends on patient opinion. In accordance with this, changes in demand and utilization must be accepted and considered when prosthodontic treatment options are discussed and evaluated. Prosthodontic treatment is highly individual and not immediately related to oral health status, making need and demand difficult to measure. Therefore, sociodental factors should be included and evaluated in studies of need, demand, and utilization regarding prosthodontic treatment.

Acknowledgment

This study was supported by The Public Dental Health Service, Uppsala County Council, Sweden.

References

41. Österberg T, Carlsson GE, Sundh W, Fyhrlund A. Prognosis of and
39. Chisick MC, Poindexter FR, York AK. Factors influencing per-
37. Hurd LC. Older women’s body image and embodied experiences:
36. Tiggermann M, Lynch JE. Body image across the life span in
35. McGrath C, Bedi R. Gender variations in the social impact of oral
34. Hjern A, Grindefjord M. Dental health and access to dental care
33. Manski RJ, Magder LS. Demographic and socioeconomic pre-
31. Nederfors T. Attitudes to the importance of retaining natural teeth
27. Walter MH, Wolf BH, Rieger C, Boening KW. Prosthetic treatment
26. Slade GD, Hoskins GW, Spencer AJ. Trends and fluctuations in the
23. Melas F, Marcenas W, Wright PS. Oral health impact on daily per-
21. Allen PF, McMillan AS. A longitudinal study of quality of life out-
18. Österberg T, Sundh V, Gustafsson G, Gröndahl HG. Utilization of
dental care after the introduction of the Swedish dental health in-
17. Kronström M, Palmqvist S, Carlsson GE. Practice profile differences among Swedish dentists. A question-
16. Manski RJ, Moeller JF, Maas WR. Dental services. An analysis of
15. Swartz B, Svenson B, Palmqvist S. Long-term changes in marginal
14. Petersen PE, Holk D. Utilization of dental care services. In: Gift H,
13. Petersen PE. Social inequalities in dental health: Towards a the-
12. Österberg T, Lundgren M, Emilson CG, Sundh V, Birkhed D, Steen
11. Attard N, Laporte A, Locker D, Zarb G. A prospective study on im-
8. Österberg T, Sundh V, Gröndahl HG. Utilization of dental care services in a representative German sample. J Oral Rehabil
7. Österberg T, Lundgren M, Emilson CG, Sundh V, Birkhed D, Steen
6. Österberg T, Carlsson GE, Sundh W, Fyhrlund A. Prognosis of and
5. Kronström M. Prosthodontics and the general dentist. A study of
4. Petersen PE, Holk D. Utilization of dental care services. In: Gift H,
2. Österberg T, Carlsson GE, Sundh W, Fyhrlund A. Prognosis of and
1. Österberg T, Carlsson GE, Sundh W, Fyhrlund A. Prognosis of and
Literature Abstract

Facial disfigurement in patients with head and neck cancer: The role of social self-efficacy

The purpose of this clinical study was to investigate the role of social self-efficacy in patients with facial disfigurement with respect to their psychologic and social functioning. Social self-efficacy was defined as the extent to which patients believe that they are capable of exercising control over the reaction and openness of others. Consecutive patients during routine check-up appointments who met the eligibility criteria were asked to participate in this study. A total of 76 patients participated (72% response rate), which was a representative sample in terms of age and gender of the head and neck cancer population seen at this hospital. The average age of the 44 males and 32 females in the study was 58 years (SD = 12.69). The extent of facial disfigurement (1 = not at all to 4 = very) was rated for each patient, with a mean score of 1.97 found (SD = 0.97). Impairments of patients’ facial expressions (1 = not at all to 4 = very much) were rated by physicians, with a mean score of 2.17 found (SD = 1.62). Patients reported social self-efficacy using a 4-point scale (1 = never to 4 = always), with a mean of 3.04 found (SD = 0.41). Psychologic distress was assessed using the State-Trait Anxiety Inventory, another 4-point scale (1 = not at all to 4 = very much), with a mean of 1.64 found (SD = 0.66). Patients’ level of distress in reaction to unpleasant behavior of others was assessed using a 4-point scale (1 = seldom to 4 = very often), with a mean of 1.58 found (SD = 0.75). Finally, the mean score for patients’ level of social isolation (1 = never to 4 = always) was found to be 1.83 (SD = 0.46). Regression analyses revealed an interaction effect between extent of facial disfigurement and social self-efficacy on psychologic distress. Regression analyses also revealed an interaction effect between extent of facial disfigurement and social self-efficacy on patients’ distress in reaction to others’ unpleasant behavior. In conclusion, facial disfigurement, as assessed both by patients and physicians, was positively related to psychologic distress and distress in reaction to others’ unpleasant behavior, but only when patients did not feel self-efficacious in social encounters.

Hagedoorn M, Molleman E. Health Psychol 2006;25:643–647. References: 29. Reprints: Mariet Hagedoorn, Department of Public Health and Health Psychology, Northern Center for Health Care Research, University Medical Center Groningen, University of Groningen, The Netherlands. PO Box 196, Groningen 9700 AD, The Netherlands. E-mail: m.hagedoorn@med.umcg.nl—Alvin G. Wee, OSU College of Dentistry, Columbus, OH.
Oral diseases are not cured by means of prosthetic treatment. Instead, the main role of prosthodontics is the rehabilitation of patients after loss of teeth and oral function. However, there are no generally accepted rules about how to estimate need, demand, or utilization of prosthodontic services in most situations, since individual preferences play a very important role.1,2 Many factors are involved in the prosthodontic treatment process. The patient’s financial situation has a great impact, and patient preference is also an important factor. Attention has been paid to the gatekeeping processes between both need and demand and between demand and utilization.3 Attempts have also been made to evaluate need and demand for prosthetic services over time in populations.4 Subjective need should not be considered as equivalent to demand for treatment but rather as a prerequisite for a possible demand. However, the definition of objective need by professionals merely puts one subjective opinion—the professional’s—against another subjective opinion—the patient’s. In this study, “desire for implants” will be referred to as “possible demand.” Because of new technology, more restorative options have become available for partially and completely edentulous patients, and therefore changes in demand for prosthodontic treatment are interesting to evaluate in longitudinal studies. The need for implant treatment in particular has come into focus, since this treatment option has provided excellent long-term results in the rehabilitation of the partially or completely edentulous patient.

The purpose of the present study was to examine changes in attitudes toward desire for implant treatment over time with respect to dental status in a population of middle-aged and older individuals in Sweden.

**Purpose:** To assess, at a 10-year interval, changes in attitudes toward desire for implant treatment among middle-aged and older Swedish subjects with respect to dental status. Materials and Methods: Three thousand subjects, residents of Örebro County, Sweden, were surveyed via the same questionnaire in 1989 and again in 1999 regarding their possible need for and interest in implant-based prosthodontic treatment. Results: One thousand six hundred sixty-five subjects responded to both surveys. In 1989 few respondents indicated an interest in implant treatment, whereas in 1999, 92% of those who had not indicated an interest in the earlier survey now indicated that they desired implant treatment. The cohort reporting having no teeth had a considerable lower increase in desire. Among those who reported a possible treatment need (ie, missing 1 or more teeth and had not had them replaced or those who wore complete dentures), cost was the most commonly cited reason for declining implant treatment. Conclusions: There was a dramatic increase in the interest for implant treatment over the period from 1989 to 1999. Changes in awareness of implant treatment, along with an expansion in the number of qualified providers, may have contributed to this increase. Int J Prosthodont 2008;21:481–485.
Changes in Attitudes Toward Desire for Implant Treatment

Two questionnaire studies were performed, one in 1989 and the other in 1999, with the intention of evaluating the desire for implant treatment among 3,000 subjects aged 45 to 69 years in Örebro County, Sweden. The participants were randomly selected from the official population register. This Swedish county has about 280,000 inhabitants and was considered average socially and economically at the time of the studies. A questionnaire was mailed to all subjects, and the response rate in 1989 was 79.4% (2,383 individuals).

Of the original sample, 2,708 respondents were found in the national population register 10 years later, on the basis of the criteria that they were alive and still resided in Örebro County. In 1989, a new questionnaire was mailed to them.

The number of respondents in the 1999 survey was 1,848, yielding a response rate of 68%. Among those, 1,665 (90%) had also responded in the 1989 survey. The individuals who responded in both 1989 and 1999 constituted the panel used in this study and accounted for 56% of the 1989 survey sample.

A nonresponse analysis was presented earlier. A comparison of those who responded only in 1989 with those participating in both 1989 and 1999 found significant differences between the groups. The subjects who responded on both occasions were, compared with those who responded only in 1989, younger, had a higher level of education, and reported better dental status, ie, fewer of them wore removable dentures. Internal nonresponse varied for different questions, which resulted in different n values for different analyses. Among those responding in both 1989 and 1999, however, no significant differences in dental condition were noted between nonresponse groups and the other subjects.

Materials and Methods

The questionnaire sought to assess dental conditions and opinions regarding dental implants. The variables used in the questionnaire were published earlier and gathered information about dental condition (in 7 categories), socioeconomic conditions, attitudes towards dentures, and desire for various kinds of prosthodontic treatment.

The 2 questionnaires were identical except for a few new questions added in 1999 about the number of lost teeth, prosthodontic treatments, and various complications having occurred since the previous survey. Written information about costs and treatment procedures for implants was included in both questionnaires. The information included estimated costs for a complete-arch fixed implant-supported prosthesis in the maxilla, for a single-tooth implant restoration, and for complete maxillary and mandibular dentures. The cost of implant treatment was considerable, although such treatment was subsidized by the national dental insurance system. For example, the treatment cost for a complete-arch fixed implant-supported prosthesis was approximately 5 times higher than that for conventional removable dentures in both 1989 and 1999. Questions presented elsewhere related to the subjects’ dental conditions and desire for implant treatment. Participants missing 1 or more teeth that had not been replaced, and those with removable denture(s), were considered to have a possible treatment need. Subjects who reported that all teeth remained were asked 2 hypothetical questions about what prosthodontic treatment they would prefer if they lost 1, a few, or all teeth. The response options included “no treatment,” “dental implants,” “conventional fixed partial denture,” and “removable denture.” No “don’t know” response alternative was presented for any of the questions. Only those who responded that they would choose dental implants were considered having a possible desire for such treatment. The total panel was divided into 2 groups—those with and those without changes in dental conditions during this period—to evaluate their need for implant treatment.

Statistical Methods

Statistical significance was determined through Pearson chi-square test with \( P < .05 \) as the significance level. For dichotomous responses, odds ratios (ORs) with 95% confidence intervals were also calculated. All calculations were done in SPSS 11.0.

Results

There was a substantial increase in reported desire for implant treatment. Ninety-two percent of those who did not express a desire for implants in 1989 had changed their mind 10 years later (Table 1). There was a very high probability (OR = 3.9) that participants who wanted implant treatment in 1989 held the same opinion 10 years later.

Age group differences among those who desired implant treatment in 1989 are presented in Table 2. The reported desire for implant treatment decreased with age. There were no significant age differences in 1999, since almost all respondents desired implants.

Fifty-seven of the 111 edentulous individuals (7% of the panel) answered the questions regarding the desire for implant treatment. Two thirds of those (32 individuals) reported a desire for implant treatment at the time of the second questionnaire study. Of those who were edentulous and not interested in having implant treat-
ment in 1989, 38% changed their opinion and reported an affirmative attitude in the study 10 years later. The increase in desire for implant treatment was similar between those who reported changes and those without changes in dental conditions over the 10-year period.

Changes in desires of respondents with a possible treatment need, missing 1 or more teeth, and with or without removable dentures, are presented in Table 3. This group had a significant increase in desire for implant treatment between 1989 and 1999, whereas there was no significant increase among those without such a need. Of the total cohort, 92% had changed their minds in 1999.

Cost was the major reason for not choosing implants among subjects who reported that 1 or a few teeth were missing and had not been replaced and among those with removable denture(s). No significant changes were observed between 1989 and 1999. The subjects were asked if they wanted to replace their missing teeth/removable dentures with dental implants. Those who responded that they had no interest in implant treatment were asked to indicate the reason(s) why, and several response alternatives were given (Table 4).

**Discussion**

The main result from the present study was a huge increase in interest for implant treatment from 1989 to 1999. In 1999 almost all (94%) of the study population expressed desire for implant treatment, a strongly significant increase.

**Changes in Desire**

The strong and significant change in desire for implant treatment for the entire panel, as well as for different subgroups, may be explained by increased knowledge about implant treatment. It is likely that most individuals had a better knowledge about dental implants in 1999 compared with the situation 10 years earlier because of newspaper articles and information provided by dental practitioners.

**Table 1** Changes in Desire for Implant Treatment Among Participating Subjects

<table>
<thead>
<tr>
<th></th>
<th>1989</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>No desire (%)</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Desire (%)</td>
<td>92</td>
<td>98</td>
</tr>
<tr>
<td>Total (%)</td>
<td>61</td>
<td>100</td>
</tr>
<tr>
<td>n</td>
<td>801</td>
<td>1,319</td>
</tr>
</tbody>
</table>

*Chi-squared = 18.98; degrees of freedom 1; P < .001, odds ratio 3.9 (95% confidence interval 2.0–7.4).*

**Table 2** Desire for Implant Treatment with Respect to Age in 1989 (n = 2,383)

<table>
<thead>
<tr>
<th>Age</th>
<th>No desire (%)</th>
<th>Desire (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>45–49</td>
<td>54</td>
<td>46</td>
<td>100</td>
</tr>
<tr>
<td>50–59</td>
<td>66</td>
<td>34</td>
<td>100</td>
</tr>
<tr>
<td>60–69</td>
<td>78</td>
<td>22</td>
<td>100</td>
</tr>
</tbody>
</table>

*Chi-squared = 99.54; degrees of freedom 2; P < .0001.*

**Table 3** Changes in Desire for Implant Treatment Among Subjects with Possible Need

<table>
<thead>
<tr>
<th></th>
<th>1989</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>No desire (%)</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Desire (%)</td>
<td>92</td>
<td>98</td>
</tr>
<tr>
<td>Total (%)</td>
<td>77</td>
<td>100</td>
</tr>
<tr>
<td>n</td>
<td>705</td>
<td>911</td>
</tr>
</tbody>
</table>

*Possible need = Missing 1 or a few teeth and not replaced or wearing removable denture(s). Chi-squared = 9.33; degrees of freedom 1; P = .002; odds ratio 4.36 (95% confidence interval 1.6–12.2).*

Increasing knowledge of implants may have had an impact on clinicians’ practice profiles. In 1989, few practitioners in Sweden with board certification in prosthodontics or had received mandatory additional training were allowed to perform the restorative part of the implant treatment within the dental insurance system. By 1999, all clinicians were allowed to perform implant treatment, including the surgical part, within the insurance system; this may have influenced clinicians to inform patients about this option. During the last decades, there has been a clear trend to involve the patient in the prosthodontic treatment planning process. This has resulted in a more patient-oriented decision-making process using the emancipatory perspective in which the patient-practitioner dialogue is of utmost importance to achieve an optimal treatment outcome. However, clinicians may still play a dominant role in the information and decision-making process in implant dentistry.

The overall desire for a better oral health–related quality of life has become a reality in dentistry. Further, there is evidence that a high interest in esthetic dentistry and tooth bleaching among patients could be related to television commercials publicizing new cosmetic treatment options. This could be related also to innovations that focus on consumption, which could promote an increased interest, especially among the young, wealthy, and well educated.
The results of the study indicate a great increase in desire for implant treatment for those with a possible treatment need. This could support the assumption that an individual’s need may turn from latent to manifest, when previously unrealistic treatment options become available. New desires will emerge.1

Edentulism and Desire for Implants

Among the 111 individuals who reported having no natural teeth, with or without removable dentures, the response rate was only 42%. The number of respondents was sufficient to permit some conclusions; 47 persons allowed a precision of about 15%. This rather small group had a lower increase in desire compared to the total panel. This could be the effect of several socio-economic gatekeeping processes.11 Individuals with less education and low income tend to have poorer dental status, in part because of poor finances, and edentulism is often associated with poverty and deprivation.12 It is likely that some individuals do not even consider treatments they know they cannot afford. In such situations, the desire for treatment does not change from latent to manifest. The national dental insurance system in Sweden was introduced in 1974, with the intention to help all citizens afford necessary treatment, especially expensive prosthodontic care. However, the results of the present study clearly indicate that several edentulous individuals are still unable to afford implant-supported prosthodontics. It is obvious that although Sweden has a general dental insurance system, there are still orally handicapped individuals who are not able to benefit from implants because of the high costs.

Another possible explanation could be that older individuals who are accustomed to wearing dentures have little or no interest in implant treatment.13 Studies indicate that a large number of patients (65% to 90%) are satisfied with the functional aspects of their dentures, often in spite of technical imperfections identified by dental professionals.14,15 There is also evidence that removable prostheses are preferred among those who have few or no remaining teeth, compared with those who have only 1 or a few missing teeth.16 It appears that those with a removable prosthesis have a lower expectation and demand for oral function and esthetics, and that satisfaction with removable prostheses may be a rationalization in which an attitude could develop through behavioral change.17,18

Reasons for Not Choosing Implants

In the questionnaires, there were also questions that evaluated reasons for not choosing implant treatment. The structure of the gatekeeping processes determining an individual’s choice was discussed in an earlier study.4 Such processes are multifactorial. For example, there can be combinations of problems of oral health and quality of life, psychologic factors and health beliefs, social structure and demographics, and economic factors.

In the second study, more individuals with 1 or a few missing teeth that had not been replaced and those wearing removable dentures expressed interest in choosing implants compared with the situation 10 years earlier. This could indicate that when a treatment option has become a realistic alternative and is conceivable, patients are more motivated to make a final decision regarding whether or not to choose treatment. Cost was the major reason for not desiring implant treatment, but also the percentage of those who reported that they were “afraid of surgery” and “afraid of unknown side effects” had increased slightly over the 10-year period. A study of Walton and MacEntee showed that the most common reason for refusing free treatment with implant-supported mandibular dentures was concern about surgical risks.15 Dental anxiety appears to be an important gatekeeper in dentistry among many patients.19 In the present study, women were more concerned about implant surgery and the risk of unknown side effects of implants (Table 1). Such a gender variation has been discussed in other prosthodontic studies.20,21

Validity

A validation study was performed earlier among the subjects in the 1989 questionnaire showing high agreement

<table>
<thead>
<tr>
<th>Response alternative</th>
<th>1989</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Men (%)</td>
<td>Women (%)</td>
</tr>
<tr>
<td>Cost for treatment</td>
<td>45</td>
<td>55</td>
</tr>
<tr>
<td>Too invasive</td>
<td>37</td>
<td>63</td>
</tr>
<tr>
<td>Afraid of surgery</td>
<td>33</td>
<td>67</td>
</tr>
<tr>
<td>Afraid of side effects</td>
<td>40</td>
<td>60</td>
</tr>
</tbody>
</table>

*Possible need = Missing 1 or a few teeth and not replaced or wearing removable denture(s).

1989: Chi-squared = 14.42; degrees of freedom 3; P < .006. 1999: Chi-squared = 28.12; degrees of freedom 3; P < .001.
between self-reported and clinically observed number of missing teeth, replaced teeth, and removable dentures. This was in accordance with another validation study on congruence between clinical findings and patients’ self-reported oral status. In the present study, the focus was not on self-reported dental conditions but on attitudes and opinions regarding need and demand, which may have even better validity because the subjects are reporting their opinions. The nonresponse rate should be less important when studying changes in attitudes over time among the same individuals in a cohort on two different occasions. Changes in attitudes are principally intrapersonal, since the panel included the same individuals on both occasions.

The results of the present study should be interpreted with some caution. Questionnaire may not, of course, provide all the answers when evaluating actual desire for implant treatment. In some aspects the questions were hypothetical, and the responses should be assessed with that in mind. However, the magnitude of changes in attitude seems to be unambiguous, and the expressed desire for implant treatment could be seen as a result of changes in society, with new standards of esthetics, new cosmetic treatment options, and desire for a better oral health–related quality of life, rather than of self-perceived functional need.

Conclusion

This study shows that almost all surveyed individuals expressed desire for implant treatment in 1999, which is a major increase in interest compared with the findings in the 1989 study. Individuals with a possible treatment need showed a great change in desire for implant treatment, pointing out the fact that when an individual’s need alters from latent to manifest, the treatment need changes even more. Cost was the major gatekeeper for not expressing desire for implant treatment. Costs, along with uncertainty about risks and physical and technical prerequisites, are among the factors that apparently can influence a patient’s choice of prosthodontic treatment. The findings in the present study are in agreement with those in previous articles in this series, where it is inferred that there is no true objective or subjective need and demand, especially in prosthodontic treatment. Manifest need and demand change over time and are influenced by the patient’s attitude and situation and the clinician’s practice profile. True need can only be identified in a dialogue between the professional and the patient.

Acknowledgment

This study was supported by The Public Dental Health Services, Uppsala County Council, Sweden.

References

Factors Explaining Desire for Dental Implant Therapy: Analysis of the Results from a Longitudinal Study

Birger Narby, LDS, Ingrid Collin Bagewitz, DDS, PhD, Björn Söderfeldt, PhD, DrMedSc

Purpose: The aim of this research was to investigate possible factors behind the desire for and changes in attitude toward implant treatment in a population of middle-aged and older individuals in Sweden. Materials and Methods: In 1989 and 1999, questionnaires were sent to 3,000 residents in Örebro County, Sweden. Response rates were 79% and 68%, respectively. Those responding to both questionnaires yielded a longitudinal study panel. Logistic regression models were done with “desire of implant treatment” and “changes in desire of implant treatment” as dependent variables. Results: Older people, non-city residents, and those with one or several missing and unreplaced teeth changed their desire for implant treatment between study years. Effects of age, residence, and better dental status disappeared during the 10-year study period. Those who were edentulous and those with removable dentures (pseudo $R^2$: 0.17) expressed lower desire for treatment than those with all teeth remaining or only one or a few teeth missing (pseudo $R^2$: 0.24) in 1989. High income significantly increased the probability to desire implant treatment for the study panel at both study occasions ($P = .016$ and $P = .034$ for 1989 and 1999, respectively). Conclusions: Factors influencing desire for implant treatment were primarily income and dental status. The influence of young age, urban living, and dental status regarding the subgroup with one or several teeth missing in relation to those with all their teeth disappeared during the 10-year study period. Int J Prosthodont 2011;24:437–444.
Factors Explaining Desire for Dental Implant Therapy

Sweden. Participants who responded in both 1989 and 1999 constituted the panel used in the present study and accounted for 56% of the total survey sample in 1989. The study group has been presented in previous publications.\textsuperscript{5,6} A nonresponse analysis was presented previously. When comparing those who responded only in 1989 with those participating in both 1989 and 1999, there were significant differences between the groups. Subjects who responded on both occasions compared to those who responded only in 1989 were younger, had a higher level of education, and reported better dental status, ie, fewer participants wore removable dentures. Internal nonresponse varied for different questions, which means different $n$ values for different analyses. Among those responding in both 1989 and 1999, however, no significant differences in dental conditions were noted between nonresponse groups and other subjects.\textsuperscript{7}

The questionnaire, among other things, aimed at measuring dental conditions and opinions regarding dental implants and gaining information about demographics, social structure, oral health–related quality of life, desire for various types of prosthetic treatment, and psychologic factors of interest. The variables used in the questionnaire were published previously.\textsuperscript{7} The validity of answers with regard to dental conditions was analyzed in a previous study.\textsuperscript{8}

Questions related to the subjects’ dental conditions and desire for implant treatment were posed. Participants missing one or more teeth not being replaced and those completely edentulous with or without removable dentures were, in the present study, considered as having a possible treatment need. A hypothetical demand in this study is described as desire for implant treatment. The following questions were addressed to gauge desire for implant treatment:

- If you, who have all of your own teeth left, would lose all of your teeth in one arch, what treatment would you prefer? (four choices, with implants as one of them)

The questions aimed to address respondents with various types of dental statuses. Those who responded that they would choose dental implants were considered as having a possible desire for such treatment.\textsuperscript{4} Choosing dental implants was set as the dependent variable in the regression models.

The following variables from the questionnaires were used as independent variables in the present study:

- Age in years (three categories): 45 to 49 years, 50 to 59 years, 60 to 69 years (in 1989)
- Individual income (divided into eight equidistant groups): < 100,000 SEK, 101,000 to 150,000 SEK, 151,000 to 200,000 SEK, 201,000 to 250,000 SEK, 251,000 to 300,000 SEK, 301,000 to 350,000 SEK, 351,000 to 400,000 SEK, > 401,000 SEK
- Sex: male, female
- Marital status: married and cohabitants, single
- Education: low (≤ 9 years), medium (10 to 12 years), high (> 12 years)
- Place of residence: city, village or rural
- Dental status (in four categories): all teeth left, ie, all teeth remaining or all missing teeth replaced by fixed partial dentures (better dental status); one or several teeth missing, ie, one or several teeth missing and not replaced by fixed partial dentures (medium dental status); removable denture, ie, wearing removable partial denture(s) and not edentulous in any arch (bad dental status); completely edentulous in one or both arches, ie, edentulous in one or both arches and wearing or not wearing a denture (bad dental status)
- Dental care delivery system: private practice, public dental health system

Frequencies for the different variables are shown in Table 1. Internal nonresponse varied for different questions, listwise deletion of missing data, which means different $n$ values for different questions. The frequencies were calculated from the questionnaire in 1989 since they changed little during the period. Implant desire, however, was calculated from the frequencies for the different variables.

There were also two attitudinal scales, in seven steps, that were dichotomized in the analysis:\textsuperscript{5} importance of dental function (unimportant to important)
Narby et al

and importance of good dental appearance (unimportant to important). These scales are shown in Table 2 together with the variables for age and income.

Statistical Analysis

Three different logistic models were used to analyze the responses for those participating in 1989 and in 1999 and for analysis of the differences in responses between those who participated in both 1989 and 1999. The effect of independent variables was expressed as odds ratios. Nagelkerke (pseudo) $R^2$, classification plots, and correctly predicted cases were calculated for determination of goodness of fit of the models. The same model was used for analysis of nonresponders (individuals who did not respond to the question who desired implants). Frequency distributions were calculated for the various measures. The statistical significance of differences was determined using the Pearson chi-square test with $P < .05$ as the significance level. All calculations were completed using SPSS 11.0 (SPSS).

Results

A logistic regression model was constructed with the dependent variable as respondents stating a desire, in contrast to those without a desire, for implant treatment in 1989. It showed a significantly higher probability for desire of implant treatment for the independent variables “higher income,” “younger age,” “better dental status,” “urban living,” and “concern for a good dental appearance” (Table 3). Income had the strongest association with desire for implant treatment. There was a 7% higher probability to desire implant treatment between each of the 8 equidistant groups, giving a total 56% higher probability to desire implant treatment for those with the highest level of income than for those with the lowest level.

An association between desire for implant treatment and dental status was, however, not expected. Those with a higher “objective” need, ie, those with removable dentures and those who were edentulous, had a lower probability of desiring implant treatment than all other categories of dental status (Table 3). Income had the strongest association with desire for implant treatment. There was a 7% higher probability to desire implant treatment between each of the 8 equidistant groups, giving a total 56% higher probability to desire implant treatment for those with the highest level of income than for those with the lowest level.

A logistic regression model was constructed for the population responding in 1999 with the dependent variable as respondents desiring implant treatment in contrast to others (Table 4). High income still increased the probability to desire implant treatment for the total population. There was also no change in association as to dental status. However, there was a change in desire for implant treatment for

### Table 1

<table>
<thead>
<tr>
<th>Sex</th>
<th>%</th>
<th>n</th>
<th>n (total)</th>
<th>Total non-respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>48</td>
<td>1,136</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Women</td>
<td>52</td>
<td>1,247</td>
<td>2,383</td>
<td>617</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Education</th>
<th>%</th>
<th>n</th>
<th>n (total)</th>
<th>Total non-respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 9 y</td>
<td>75</td>
<td>1,761</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10–12 y</td>
<td>11</td>
<td>265</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 12 y</td>
<td>14</td>
<td>326</td>
<td>2,352</td>
<td>648</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marital status</th>
<th>%</th>
<th>n</th>
<th>n (total)</th>
<th>Total non-respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single</td>
<td>79</td>
<td>1,977</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>21</td>
<td>491</td>
<td>2,368</td>
<td>632</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Place of residence</th>
<th>%</th>
<th>n</th>
<th>n (total)</th>
<th>Total non-respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>City</td>
<td>56</td>
<td>1,332</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>44</td>
<td>1,042</td>
<td>2,374</td>
<td>626</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dental category</th>
<th>%</th>
<th>n</th>
<th>n (total)</th>
<th>Total non-respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>All teeth remaining</td>
<td>34</td>
<td>794</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One or several teeth missing</td>
<td>43</td>
<td>1,007</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completely edentulous in one or both arches</td>
<td>16</td>
<td>380</td>
<td>2,347</td>
<td>653</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dental care delivery system</th>
<th>%</th>
<th>n</th>
<th>n (total)</th>
<th>Total non-respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Private practice</td>
<td>79</td>
<td>1,749</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public dental health service</td>
<td>21</td>
<td>472</td>
<td>2,221</td>
<td>779</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Implant desire (1989)</th>
<th>%</th>
<th>n</th>
<th>n (total)</th>
<th>Total non-respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>68</td>
<td>1,614</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>32</td>
<td>769</td>
<td>2,383</td>
<td>617</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Implant desire (1999)</th>
<th>%</th>
<th>n</th>
<th>n (total)</th>
<th>Total non-respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>5</td>
<td>79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>95</td>
<td>1,394</td>
<td>1,463</td>
<td>1,537</td>
</tr>
</tbody>
</table>

### Table 2

<table>
<thead>
<tr>
<th>Mean SD</th>
<th>n (total)</th>
<th>Total non-respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>8 equidistant steps</td>
<td>5.42 2.84 2.112 888</td>
</tr>
<tr>
<td>Age</td>
<td>Continuous</td>
<td>57.50 7.55 2,383 617</td>
</tr>
<tr>
<td>Importance of dental function</td>
<td>7 steps</td>
<td>2.31 1.84 2.241 759</td>
</tr>
<tr>
<td>Importance of good dental appearance</td>
<td>7 steps</td>
<td>4.37 1.91 2.053 947</td>
</tr>
</tbody>
</table>

SD = standard deviation.
### Table 3  Logistic Regression Model With Respondents Stating a Desire for Implant Treatment in Contrast to Those Without a Desire for Implant Treatment in 1989 as the Dependent Variable

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Total</th>
<th>a</th>
<th>OR</th>
<th>P</th>
<th>b</th>
<th>OR</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income (8 equidistant steps)</td>
<td>1.27</td>
<td>0.016</td>
<td>1.05</td>
<td>0.90</td>
<td>1.16</td>
<td>0.039</td>
<td></td>
</tr>
<tr>
<td>Sex (female; male ref cat)</td>
<td>1.18</td>
<td>0.459</td>
<td>1.07</td>
<td>0.66</td>
<td>1.31</td>
<td>0.419</td>
<td></td>
</tr>
<tr>
<td>Single (married or cohabitant ref cat)</td>
<td>1.01</td>
<td>0.064</td>
<td>1.00</td>
<td>0.97</td>
<td>1.01</td>
<td>0.986</td>
<td></td>
</tr>
</tbody>
</table>

Education (< 9 y ref cat)

<table>
<thead>
<tr>
<th>Age (y) (continuous)</th>
<th>0.96</th>
<th>0.000</th>
<th>0.97</th>
<th>0.00</th>
<th>0.95</th>
<th>0.014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income (8 equidistant steps)</td>
<td>1.07</td>
<td>.016</td>
<td>1.05</td>
<td>.90</td>
<td>1.16</td>
<td>.039</td>
</tr>
<tr>
<td>Sex (female; male ref cat)</td>
<td>1.10</td>
<td>.459</td>
<td>1.07</td>
<td>.66</td>
<td>1.31</td>
<td>.419</td>
</tr>
<tr>
<td>Single (married or cohabitant ref cat)</td>
<td>1.01</td>
<td>.064</td>
<td>1.00</td>
<td>.97</td>
<td>1.01</td>
<td>.986</td>
</tr>
</tbody>
</table>

Place of residence (city ref cat)

| Income (8 equidistant steps) | 0.77 | 0.029 | 0.81 | 0.06 | 0.57 | 0.052 |
| Sex (female; male ref cat) | 1.10 | .459 | 1.07 | .66 | 1.31 | .419 |
| Single (married or cohabitant ref cat) | 1.01 | .964 | 1.00 | .99 | 1.01 | .980 |

**Total: n = 1,691 (nonrespondents = 1,309); a = respondents with all teeth remaining or missing teeth replaced by fixed prosthodontics or not replaced at all (n = 1,306, nonrespondents = 485); b = respondents wearing removable partial denture(s) or edentulous in one or both arches (n = 355, nonrespondents = 191). OR = odd ratio; ref cat = reference category.**

Total: correctly predicted cases: 71.4%, 7.2% improvement; model $\chi^2$: 274.9, $P < .001$, 13 df; Nagelkerke $R^2$: 0.21.

Total: correctly predicted cases: 68.9%, 9.0% improvement; model $\chi^2$: 195.2, $P < .001$, 11 df; Nagelkerke $R^2$: 0.18.

b: correctly predicted cases: 80.6%, 0% improvement; model $\chi^2$: 36.0, $P < .001$, 11 df; Nagelkerke $R^2$: 0.15.

### Table 4  Logistic Regression Model With Respondents Stating a Desire for Implant Treatment in Contrast to Those Without a Desire for Implant Treatment in 1999 as the Dependent Variable

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Total</th>
<th>a</th>
<th>OR</th>
<th>P</th>
<th>b</th>
<th>OR</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income (8 equidistant steps)</td>
<td>1.16</td>
<td>0.034</td>
<td>1.21</td>
<td>0.025</td>
<td>1.00</td>
<td>0.995</td>
<td></td>
</tr>
<tr>
<td>Sex (female; male ref cat)</td>
<td>1.82</td>
<td>0.086</td>
<td>1.98</td>
<td>0.156</td>
<td>1.79</td>
<td>0.413</td>
<td></td>
</tr>
<tr>
<td>Single (married or cohabitant ref cat)</td>
<td>0.83</td>
<td>0.008</td>
<td>0.80</td>
<td>0.527</td>
<td>1.02</td>
<td>0.379</td>
<td></td>
</tr>
</tbody>
</table>

Education (< 9 y ref cat)

<table>
<thead>
<tr>
<th>Age (y) (continuous)</th>
<th>0.10</th>
<th>0.000</th>
<th>0.09</th>
<th>0.269</th>
<th>0.05</th>
<th>0.796</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income (8 equidistant steps)</td>
<td>1.13</td>
<td>0.005</td>
<td>0.84</td>
<td>0.434</td>
<td>12.67</td>
<td>0.029</td>
</tr>
<tr>
<td>Sex (female; male ref cat)</td>
<td>0.98</td>
<td>0.000</td>
<td>1.69</td>
<td>0.551</td>
<td>5.71</td>
<td>0.214</td>
</tr>
<tr>
<td>Single (married or cohabitant ref cat)</td>
<td>1.01</td>
<td>0.005</td>
<td>1.03</td>
<td>0.269</td>
<td>0.95</td>
<td>0.276</td>
</tr>
</tbody>
</table>

Place of residence (city ref cat)

| Income (8 equidistant steps) | 1.08 | 0.792 | 1.05 | 0.002 | 1.34 | 0.606 |
| Sex (female; male ref cat) | 0.78 | 0.504 | 0.80 | 0.510 | 0.21 | 0.002 |
| Single (married or cohabitant ref cat) | 0.11 | 0.000 | 0.00 | 0.00 | 0.11 | 0.000 |

**Total: n = 1,023 (nonrespondents = 1,977); a = respondents with all teeth remaining or missing teeth replaced by fixed prosthodontics or not replaced at all (n = 980, nonrespondents = 881); b = respondents wearing removable partial denture(s) or edentulous in one or both arches (n = 103, nonrespondents = 443). OR = odd ratio; ref cat = reference category.**

Total: correctly predicted cases: 94.5%, 0% improvement; model $\chi^2$: 53.9, $P < .001$, 13 df; Nagelkerke $R^2$: 0.15.

a: correctly predicted cases: 96.4%, 0% improvement; model $\chi^2$: 14.2, $P < .001$, 11 df; Nagelkerke $R^2$: 0.06.

b: correctly predicted cases: 81.6%, 3.9% improvement; model $\chi^2$: 17.6, $P < .001$, 11 df; Nagelkerke $R^2$: 0.24.
those wearing removable partial dentures or edentulous in one or both arches. For this subgroup, the independent variables “dental care delivery system” and “education level” showed a significantly higher probability to desire implant treatment for those attending private practice and for those with medium education level.

The final logistic regression model was done with the responses to the question about desire for implant treatment from 1989 in contrast to the responses to the same question in 1999 (Table 5). Young age, urban living, and better dental status showed a higher probability for desire for implant treatment in 1989 than in 1999.

In 1999, there was a relatively high nonresponse for questions regarding implant desire (21%). In 1989, the largest internal nonresponse was seen for questions regarding importance of good dental appearance (14%) and income (11%). When comparing those who responded only in 1989 with those participating in both 1989 and 1999, the nonresponse analysis showed that there were some differences between the groups (Table 6). Subjects who responded on both occasions were younger, had a higher level of education, and reported better dental status, ie, fewer participants wore removable dentures than those who responded only in 1989. Also, women and those who were married or cohabitants had a higher degree of responding to both questionnaires.

Discussion

The findings in the present study show that older people in comparison with other age categories, those living in village or rural areas in comparison with those living in cities, and those with one or several teeth missing that were not replaced in comparison with those with all teeth remaining or replaced by fixed partial dentures had changed their mind regarding desire for implant treatment.

As stated in a previous study in this series of papers, there was an immense increase in interest for implant treatment from 1989 to 1999. In 1999, almost all (95%) of the study population expressed desire for implant treatment, a strongly significant increase and the main finding in this series of studies.

Table 5 Logistic Regression Model with the Change of Desire for Implant Treatment from 1989 to 1999 as the Dependent Variable

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>b</th>
<th>OR</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income (8 equidistant steps)</td>
<td>0.01</td>
<td>1.01</td>
<td>.740</td>
</tr>
<tr>
<td>Sex (female; male ref cat)</td>
<td>0.11</td>
<td>1.12</td>
<td>.301</td>
</tr>
<tr>
<td>Single (married or cohabitant ref cat)</td>
<td>-0.10</td>
<td>0.91</td>
<td>.589</td>
</tr>
<tr>
<td>Education (&lt; 9 y ref cat)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10−12 y</td>
<td>-0.02</td>
<td>0.98</td>
<td>.875</td>
</tr>
<tr>
<td>&gt; 12 y</td>
<td>-0.25</td>
<td>0.78</td>
<td>.294</td>
</tr>
<tr>
<td>Age (y) (continuous)</td>
<td>0.03</td>
<td>1.03</td>
<td>.001</td>
</tr>
<tr>
<td>Place of residence (city ref cat)</td>
<td>0.31</td>
<td>1.36</td>
<td>.035</td>
</tr>
<tr>
<td>Dental status (all teeth left ref cat)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One or several teeth missing</td>
<td>1.39</td>
<td>4.01</td>
<td>.000</td>
</tr>
<tr>
<td>Removable denture(s)</td>
<td>0.50</td>
<td>1.65</td>
<td>.135</td>
</tr>
<tr>
<td>Completely edentulous in one or both arches</td>
<td>-0.05</td>
<td>0.95</td>
<td>.875</td>
</tr>
<tr>
<td>Public dental care delivery system (private practice ref cat)</td>
<td>-0.01</td>
<td>1.00</td>
<td>.388</td>
</tr>
<tr>
<td>Importance of dental function (7 steps)</td>
<td>-0.03</td>
<td>0.97</td>
<td>.476</td>
</tr>
<tr>
<td>Importance of dental appearance (7 steps)</td>
<td>-0.02</td>
<td>0.98</td>
<td>.552</td>
</tr>
</tbody>
</table>

Total: n = 1,012 (nonrespondents = 1,988); OR = odds ratio; ref cat = reference category.
Correctly predicted cases: 66.9%, 13.3% improvement; model χ²: 140.09, P < .001, 13 df; Nagelkerke R²: .17.

Table 6 Logistic Regression Model Regarding Nonrespondents of the Question on Implant Desire in 1999 in Contrast to Respondents of the Same Question in 1989 as the Dependent Variable

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>b</th>
<th>OR</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income (8 equidistant steps)</td>
<td>0.11</td>
<td>1.11</td>
<td>.000</td>
</tr>
<tr>
<td>Sex (female; male ref cat)</td>
<td>0.28</td>
<td>1.32</td>
<td>.038</td>
</tr>
<tr>
<td>Single (married or cohabitant ref cat)</td>
<td>-0.48</td>
<td>0.62</td>
<td>.001</td>
</tr>
<tr>
<td>Education (&lt; 9 y ref cat)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10−12 y</td>
<td>0.37</td>
<td>1.44</td>
<td>.048</td>
</tr>
<tr>
<td>&gt; 12 y</td>
<td>0.43</td>
<td>1.54</td>
<td>.019</td>
</tr>
<tr>
<td>Age (y) (continuous)</td>
<td>-0.04</td>
<td>0.96</td>
<td>.000</td>
</tr>
<tr>
<td>Place of residence (city ref cat)</td>
<td>-0.13</td>
<td>0.88</td>
<td>.267</td>
</tr>
<tr>
<td>Dental status (all teeth left ref cat)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One or several teeth missing</td>
<td>0.01</td>
<td>1.01</td>
<td>.959</td>
</tr>
<tr>
<td>Removable denture(s)</td>
<td>-0.89</td>
<td>0.41</td>
<td>.000</td>
</tr>
<tr>
<td>Completely edentulous in one or both arches</td>
<td>-1.38</td>
<td>0.25</td>
<td>.000</td>
</tr>
<tr>
<td>Public dental care delivery system (private practice ref cat)</td>
<td>-0.11</td>
<td>0.90</td>
<td>.429</td>
</tr>
<tr>
<td>Importance of dental function (7 steps)</td>
<td>-0.06</td>
<td>0.94</td>
<td>.082</td>
</tr>
<tr>
<td>Importance of dental appearance (7 steps)</td>
<td>0.02</td>
<td>1.02</td>
<td>.817</td>
</tr>
</tbody>
</table>

Total: n = 1,691; OR = odds ratio; ref cat = reference category.
Correctly predicted cases: 69.5%, 9% improvement; model χ²: 295.67, P < .001, 13 df; Nagelkerke R²: .22.
The responses from the questionnaire in 1999 showed that the independent variables "income" and "dental status" had a significant impact on the probability to have a desire for implant treatment among the total study group.

Dental status had a significant impact on expressed desire at both study time periods. Somewhat surprising was that those with a higher "objective" need (those with removable dentures and those being edentulous in one or both arches) had a lower desire for implant treatment in contrast to others. It seems obvious from the results of the present study that edentulous patients with removable dentures do not necessarily translate that condition into a desire for implant treatment, which is in accordance with previous studies. Participants missing one or more teeth not being replaced and those who were completely edentulous with or without removable denture(s) were, in this study, considered as having a possible treatment need, though it was not possible to distinguish between the absence of an anterior tooth or molar on the basis of the information from the questionnaires. If this distinction had been possible, the results could have been even more obvious, since participants missing an anterior tooth would probably desire a replacement more than someone missing a molar. However, the number of participants missing a single molar was most likely very small considering the relatively high age of the participants. "Objective" need is less associated with dental care utilization than subjective need. This is also in accordance with the observation that there usually are great differences between provider and patient assessments of quality of life, where patients usually regard their quality of life as better than providers do. Those who need implant treatment the most, when assessed by dentists, do not desire implant treatment as much as those with all of their teeth remaining or with one or a few teeth missing. The presence of one's own teeth is a significant predictor for dental care utilization. The rather small group of edentulous participants in this study had a lower increase in desire compared to the total panel. This could be the effect of several socioeconomic gate-keeping processes. Many edentulous individuals have a low income, and it is likely that some individuals do not consider treatments they know they cannot afford, even if their oral health-related quality of life would most likely benefit significantly from the use of dental implants. In such situations, the desire for treatment does not change from latent to manifest. Other reasons could include fear of dental treatment and worry about surgical treatments, but it could also be that people really are more satisfied with their prostheses than the profession would consider.

Cost, together with dental status, is a well-known barrier in the gate-keeping behind utilization of dental care, especially for fixed prosthodontic services. Individuals with low incomes have a lower level of utilization and spend less money on dental care compared with individuals with higher incomes. This, although to a lesser extent, also holds in subsidized systems. The National Dental Insurance System in Sweden was introduced in 1973 and has changed a number of times since. The relative cost for implant treatment within the Swedish subsidized dental health care system did not decrease during the 10-year study period; rather, it increased to some extent. Income did not change as an important gate-keeping factor between the two study groups.

It seems obvious that desire for implant treatment should decrease with increased age, but in 1999, there were no longer any significant differences in age. Older people changed their minds regarding desire for implant treatment even though older individuals are said to be more reluctant about innovation. One possible explanation to this change in the older cohort could be that implant treatment and its good results had become well known, especially among older people where edentulism is more common. Other possible explanations could be that information about implant treatment was addressed to edentulous patients through newspapers, manufacturers, and dentists. More dentists had also adopted the treatment option of dental implants and were more comfortable with this treatment procedure. Supply and information about implant treatment had thus increased. On the other hand, older people with removable dentures do not attend dental clinics as often as those with a better dental status and, thereby, do not have the same information as individuals with higher utilization of dental services. This could also partly explain why the small edentulous group in the present study had a lower probability to desire treatment compared to the total panel.

During the past couple of decades, there has been a clear trend to involve the patient in the prosthodontic treatment-planning process. However, dentists may still play a dominant role in the information and decision-making process in implant dentistry. Stronger practice beliefs in certain treatment options give a higher rate of specific prosthetic utilization. Studies indicate that dentists' opinions and clinical judgments are of greater importance than research evidence in treatment planning and decision making. Demand is not only dependent on a manifest need, but also on the information and availability of different treatment options.
Rural residence played a significant role in 1989 but not in 1999. The importance of place of residence has in many ways been leveled out with the growth of mass communication. There is scarce evidence for different ideals regarding appearance and oral health-related quality of life because of place of residence. Studies indicate that the rural population is retaining more teeth and, consequently, may need and seek dental services more often than previously when there were pronounced differences in dental status between different place-of-residence cohorts. However, it is less probable that associations are biologically determined and, if so, they are probably underestimated.

There might be a supplier-induced demand, which means overconsumption of medical services, generated by the economic self-interest of physicians who exaggerate patient needs. The results in the present study indicate, however, that the difference in the Swedish dental care delivery system between public dental health care and private practice did not influence the desire for implant treatment, except for in the subgroup with removable dentures. For this group, there was a significantly higher probability to desire implant treatment than those attending private practice dental clinics to have a desire for implant treatment compared to those attending public dental health clinics. There was also a significant difference regarding education for this same cohort with removable dentures. Those with medium (10 to 12 years) education had a significantly higher desire for implant treatment than those with low education.

Oral health-related quality of life includes freedom from pain, optimal oral function, and good dental appearance. Dissatisfaction with appearance has been found to be a major reason for transformation of need into demand. There were no significant changes in desire for these categories in the present study. In 1989, there was a significant association between importance of good dental appearance and desire for implant treatment. This association was no longer significant in 1999, possibly because the overwhelming majority of respondents expressed demand for implants, leaving little room for variation.

Considering nonresponse, there was a clear bias in the response pattern. Point estimates are thus not reliable and probably too low, with underrepresentation of unmarried, low-educated men with bad teeth. However, it is less probable that associations are biased, and, if so, they are probably underestimated. Thus, analysis of the nonrespondents in 1999 indicated that some of the independent variables could be underestimated. There was an 11% higher probability to respond to the questionnaire for every income group. A higher response rate to the questionnaire in 1999 would probably have increased the impact of income even more.

A strength of this study is the longitudinal design, together with the use of multivariate analysis. Each effect of the independent variables is assessed, keeping the other variables constant, thus linking the individual patient’s outcome over time to the effect of an independent variable. In this study, focus was on attitudes and opinions regarding need and demand, which may have a positive effect on validity. The nonresponse rate should be less important when studying change in attitudes over time among the same individuals in a cohort at two different occasions. Changes in attitudes are principally intrindividual since the panel includes the same individuals at both occasions.

The results of the study are over 10 years old, and it may be questioned whether the results are therefore applicable today. To the authors’ knowledge, there has not been any major change in attitude toward implant treatment since, nor has there been any considerable change in cost for the cohorts in this study. It seems as though the present study happened to occur during a period where there was a dramatic change in attitude toward implant treatment. At the time of the second questionnaire, a vast majority expressed that they would consider and prefer implant treatment. To the authors’ knowledge, there has been little change in social priorities, meaning that a change back to less desire for implant treatment is unlikely. Moreover, the purpose of this study was to discuss the factors behind the major change in attitude toward implant treatment, and this has not altered recently.

Further studies are important to provide greater insight toward the influence of the number and location of missing teeth, as well as other factors such as psychologic factors, possibilities to maintain oral hygiene, and fear of complications.

Conclusion

Manifest need and desire for implant treatment most likely changes over time. Factors influencing desire for implant treatment are income and dental status. Age, place of residence, and concern for dental appearance no longer influenced desire for implant treatment at the end of the studied 10-year period. Individuals with removable dentures or those who were edentulous in one or both arches had a lower probability to desire implant treatment than those with all their teeth remaining or with missing teeth replaced by fixed partial dentures.
Acknowledgment

This study was supported by the Public Dental Health Services, Uppsala County Council, Sweden.

References

A GROUNDED THEORY ON IMPORTANT FACTORS INVOLVED IN TREATED PATIENTS’ DECISION-MAKING PROCESS FOR IMPLANT THERAPY.

Birger Narby, DDS
Ulrika Hallberg, Ass. Prof
Ingrid Collin Bagewitz, DDS, Ph.D
Björn Söderfeldt, Ph.D, DrMedSc

aSenior Consultant, Dept of Prosth. Dentistry, Public Dental Health Service, Uppsala, Sweden
bAssociate Professor, Nordic School of Public Health, Göteborg, Sweden
cSenior Consultant, Dept of Prosth. Dentistry, Public Dental Health Service, Malmö, Sweden
dProfessor, Dept of Oral Public Health, Malmö University, Malmö, Sweden

Reprint requests:
Dr. Birger Narby
Dept of Prosthetic Dentistry, Public Dental Health Service,
Box 1813, S-751 48 Uppsala, Sweden.
Phone:+46 18 6116380
Fax:+46 18 692947. E-mail: birger.narby@lul.se
Abstract
Aim: The aim was to describe a) the process leading to desire for implant treatment and b) how patients missing teeth gained information about implant treatment and also to c) identify gatekeeping factors, and d) experiences in changes in oral health related quality of life.

Methods: The constant comparative method for grounded theory was used in collecting and analysing data. Ten informants participated in the study, all treated with implant supported fixed dentures during the last year.

Results: The emerging core category was that the participants experienced a journey from social stigma to exhilaration. This process ended up in the perspective that the participants’ new life with dental implants indeed was very good and meant an end of their social stigma, but had some gatekeepers before treatment such as cost, and some aspects within dental anxiety. The dentist’s opinion and suggestions was the most decisive part in the decision making process and the trust in the dentist and his/her dental team was crucial for the decision to undergo treatment, and for the whole experience with the treatment. A great improvement in oral health related quality of life was stated.

Conclusion: This qualitative study gives as the core category and main finding the importance of the patients’ trust and confidence in the dentist and his/her staff, in the process of transforming desire for dental implant treatment into a manifest demand, and also in making it more likely for the patients’ to become satisfied with the treatment result regardless of complications.

Keywords: edentulousness, dental, implant therapy, need, demand, grounded theory, decision-making
Introduction

Edentulousness and the use of dentures have for most people a pronounced impact on well-being and oral health related quality of life.\(^1\) For edentulous individuals in particular, during the last thirty years, the treatment with dental implants has made it possible for dramatic improvements of oral rehabilitation.\(^2\) The need and demand for prosthetic treatment, especially implant treatment, has changed for many individuals at the same time which is in line with the general development of society.\(^3\) The overall desire for a better oral health related quality of life as well as desire for naturally looking dental constructions have become realities in prosthetic dentistry, although studies indicate that need, as assessed by dentists, overestimates the rehabilitation need, in comparison with assessment done by patients.\(^4\)

The present paper is part of a larger study where the intention is to evaluate need and demand for treatment with dental implants. Need and demand are difficult to measure since prosthodontic treatment is highly individual and not closely related to oral status.\(^5\) Need is stated as socially established in the interaction between patient and dentist. The professional attitude toward need must be that there is no true objective or subjective need. Need is established only in a communicative dialogue with mutual respect between the profession and the patient. In the prosthetic treatment decision-making process, the emancipatory perspective with the patient-dentist dialogue is of utmost importance to achieve an optimal treatment result.

Need does not always lead to demand for treatment, nor to utilization, depending on the gate-keeping processes between need and demand and between demand and utilization. Demands must be accepted through the knowledge that there is no objective need and that demand depends on the patient’s opinion. The concept “gate-keeping” refers to the social and psychological processes that transform need into demand, and demand into utilization. These factors are dependent on the patient’s opinion. Therefore, sociodental factors should be included and evaluated in studies on need and demand for utilization of prosthodontic care.\(^6\)

Still, many patients do not choose dental implants as a rehabilitation opportunity. Our knowledge about the factors behind these decisions is based on technical aspects\(^7\) and not on subjective
or psychological factors. There are few studies in this field and most of them are derived from different questionnaires with only a few questions concerning these topics. Individual opinions are difficult or impossible to capture in the analysis of questionnaire studies. Important aspects may be overlooked when it comes to the patients’ perspective. A qualitative study method makes it easier to go deeper into these issues, and to reflect opinions and results which may be concealed from a quantitative study perspective. This study is conducted according to the grounded theory which aims to develop understanding and interpretation of the individuals’ description of experiences rather than to try to seek “the objective truth”. In the last decade, there has been an increasing interest to analyse and describe the patients’ point of view, but only a few qualitative studies have been presented with implant treatment in focus.

The aims of the present study is therefore, by using the constant comparative method for grounded theory, to a) describe the process patients missing several or all teeth go through before getting treatment with a fixed implant-supported denture, and also to b) describe how the patients gained information about implant treatment, and the process leading to desire for implant treatment. Another aims is to c) identify gatekeeping factors which were important from the patients’ perspective, and to d) identify the patients’ experience of changes in oral health related quality of life after implant treatment.

**Methods**

**Qualitative method**

The constant comparative method for grounded theory, originally described by Glaser & Strauss (Modified grounded theory) was used in collecting and analysing data. This qualitative method aims at generating concepts, models, and theories, grounded in empirical data. This method implies analysing, open, axial and selective coding in order to create a structural formula in the analysis. The basic principles of grounded theory include concurrent sampling and analysis, constant comparisons, theoretical sensitivity, and saturation. Saturation is reached when new interviews do not bring additional information into the categories devised in the earlier interviews. Grounded theory has developed in sociology and is founded in symbolic interactionism, saying that meaning
is constructed and changed within interactions between people. Perceptions of the world are individual and constantly interacting. Grounded theory is one out of approximately thirty qualitative research methods and includes both induction and deduction, which means constructing a hypothesis from the obtained data, making conclusions with a starting-point from the hypothesis. Induction is a main part in grounded theory, one difference to quantitative research.

Criteria for judging the quality of a grounded theory study include fit, relevance, modifiability, parsimony, and scope. Fit means that the core category fits when it is relevant and integrates other concepts, creating the emerging theory dense, saturated and practically applicable. Relevance implies that the generated theory should conclude important phenomena and is interesting to the reader, and modifiability means that the theory could be adjusted according to new data. Parsimony and scope concern the extension of the emerging theory.

One assumption in qualitative research is that data are brought forward in interaction between researcher and informant. Therefore, the relationship between these two subjects should be paid attention to, because of its importance for the results. This reflexivity includes that the researcher must identify preconceptions which might bias the interview.

**Ethical aspects**

The study design was supported by the Research Ethics Board at the University of Uppsala, Sweden. Requirements concerning informed consent and confidentiality were promised and secured.

**Study group**

Ten informants (six women and four men; mean age 69 years, range 54-84 years) participated in the study. The informants were patients at the Specialisttandvården Kaniken, Folktandvården (Specialist Dental Care, Public Dental Health Services), Uppsala, Sweden, and treated with implant supported fixed dentures according to well-known and accepted procedures. The patients were all referred from dentists in Uppsala County to a clinic with specialists in prosthodontics and were strategically selected from the register.
at the clinic on the basis of gender, age, and place of residence. No consideration was paid to personal factors but all considered themselves of good health although two had diabetes. The socioeconomic factors were not included in the interview but could be estimated to be averagely distributed. Their dental experience was discussed in the interview but was not considered in the selection of informants. In the pre-treatment discussion had all informants received written information of estimated cost and at least at two occasion’s information about risks for major complications and about normal operative procedure. All of the informants were treated with implant supported fixed dentures during the last year. The cost for the implant treatment was subsidized according to the National Dental Insurance System in Sweden. The intention with this sampling procedure was to obtain a heterogeneous group to maximize the variations of experiences in the group studied. The dental situation of the informants is presented in Table 1.

Approach
An open, taped interview lasting up to one hour was conducted with each subject in a quiet room on other premises than the clinic. An interview guide was used, and the themes concerned 1) oral function and dental status, daily living, and quality of life before and after the treatment with an implant supported fixed denture, 2) the relative importance of having confidence in the dentist and how this is obtained, 3) gatekeepers as treatment cost, dental anxiety, or others, 4) how the informant had obtained information of implant treatment and 5) how the decision process started making a latent desire manifest.

The interviewer was a prosthodontist (first author) with much experience from dental implant treatment but without knowledge of the informants and without involvement in their treatment. The informants were informed that they could end the interview at any point and had the opportunity to raise questions of relevance to them. Each question theme gave the opportunity to a broader discussion, as for a variety of potential gatekeepers. Data collection and analysis were conducted after each interview and continued until new interviews did not provide additional information. Saturation was reached after 10 informants.
Procedure
After the selection of a presumptive informant from the patient register, each subject was informed by letter about the study and asked if they were willing to participate. Written and verbal information concerning aim and procedure of the study was given to all subjects. After a written consent, time for a taped interview was scheduled with each individual.

Data analysis
The interviews were transcribed verbatim and analysed in open, axial and selective coding processes. The process of open coding ended up with clustering substantive codes with similar content into summarizing categories, axial coding. Relationships between categories were sought and data were put together. In the selective coding, categories were saturated by additional information, assessed by adding re-coded earlier assessed data. A core category was identified, central in the collected data and related to the subcategories.

Results
Taking part of a journey from social stigma to exhilaration
The core category emerged in the present study was that the participants took part of a journey from social stigma to exhilaration as seen as flowchart in table 2, where trust in the dentist and confidence in the dentist and his/her team was a central part. This illuminates the journey from deteriorated dental health with pain and lowered self-esteem which resulted in social withdrawal e.g. social stigma, to the decision of going through with implants treatment, to feelings of gratitude and feelings of becoming the person I once was. This process ended up in a more realistic perspective that their new life with dental implants indeed was very good and meant an end of their social stigma. The process had however some gatekeepers such as fear of pain, including the risk of having problems afterwards with the implants, and costs.

The dentist's opinion and suggestions was the most decisive part in the decision making process and the trust in the dentist and his/her dental team was crucial not only for the decision to undergo treatment but also for the whole experience with the treatment. All of the informants had considered the possibility of implant treatment
for some time. Some made their decision after having initially discussed it within the family, others because of comments from acquaintances, advertisements, or because the lack of taste when eating, and of course the feeling of loose dentures. It was obvious that the trust in the dentist and his/hers skills made a very important part in the decision making process. An perhaps even bigger and more important part was the possibility to discuss the treatment options with the dentist, especially having the chance of discussing their individual need for treatment. Some of the informants changed dentist during this process because of lack of trust.

Only two gatekeeping factors were mentioned by the informants, cost and dental anxiety although other potential gatekeepers were discussed. Cost was considered as a gatekeeping factor of little importance. All but one of the informants said that they would desire and demand this treatment at almost any cost and were prepared to take a bank loan, if necessary. A correct estimation of cost together with a pronounced trust in the dentist seemed to be of importance in the decision process.

“He is a very skilled dental surgeon and I trust him completely”.

Becoming an unsecure person

*Experience decreasingly worsened oral health*

The participants described a history of many years of deteriorated oral health depending on different causes such as accidents, dental anxiety and diseases. This deteriorated oral health caused physical pain, infections and discomfort and it also caused difficulties with for example chewing, and fear of cleaning their teeth because of the risk of losing teeth. The participants’ point of view was that they had done everything in their power to improve their dental status over the years including both considerable economic efforts and also considerable personal effort in trying to have good oral hygiene. Despite all their efforts they experienced a deteriorating oral health impossible to improve or cure. This deteriorating oral health also lead to embarrassment in relation to others, the participants did not want to be seen as messy or someone that does not take care of their teeth owing to for example economical or ignorant reasons. Therefore the participants withdraw from many social activities and when they met others they tried to not show their teeth.
“I’d anxiety all the time, I’d anxiety every morning, the first thing was to feel with the tongue if anything was loose and you didn’t want to laugh too much or open the mouth.”

Living in pain and anxiety
Finally the participants lost so many teeth or all teeth that they had to wear dentures. But having dentures was even worse than the poor oral health. The dentures caused physical pain and sourness and were connected with feelings of shame and a variety of practical problems, like anxiety for the denture falling out which also occurred, gagging, and severe difficulties in chewing desired food. A major impairment of the ability to sense different food tastes was also reported by all the informants. The social consequences were massive for the participants. They felt ashamed and did not tell anybody that they had a denture except to their closest family.

A sense of powerlessness was reported by participants. They could not do anything about their ability to adapt to their denture. The sense of insecurity was common, with great reluctance to dine in public restaurants or at home with friends, fear of the denture falling out at work, difficulties with speech, and difficulty to breathe at exercise. This gave as a very common and almost unanimous result diminishing of their social contacts.

“It was difficult all the time. I lost a kilo per week, I couldn’t eat, just couldn’t, I gagged all the time, I couldn’t be among people.”

“I couldn’t sense any taste. My husband had to do all tasting when I was cooking”

Becoming a determined person
Desire for a better solution turn in to demand
The participants described how they finally felt a desire for a better solution of their dental problems than wearing a denture. The life situation with the denture was unacceptable with difficulties in eating, social, physical and psychological problems. In line with this the participants started to gather information about treatment with dental implants, how and where to get it. For example they talked to others that had already gone through with the treatment. They also discussed this issue with their family and relatives.
The participants described the cost for dental implants as a gatekeeping factor of little importance in the process of deciding whether to have or not to have the implant treatment. The reason for this seemed to be the confidence in the dentist and the belief in having got a correct pre-treatment estimation of cost, and also having had the possibility of discussing treatment options with their dentist. Only one of the informants postponed the treatment for a couple of years because of the cost. All of the others considered cost of little importance and were prepared to take a bank loan, if necessary. In the end of this process the desire for a “better solution” turned into a demand, they really wished going through with treatment with dental implants.

“I made up my mind because having a denture was no alternative. So I quit smoking and put those money aside, saving it for the treatment cost.”

**Having trust in the dentist**

It was of great importance for the participants to find a dentist they could really trust regarding both medical skills and as a person. This was true also for the dental team, the participants had a need for the same feeling of trust in them as in the dentist. The feeling of being involved in the treatment was important. Some of the participants had changed from one dentist to another because of lack of trust when discussing a possible dental implant treatment. The participants knew about dental implant treatment since long through media, from dentists or relatives, or by advertisements, but their definite decision was made after discussion with their family and ultimately with their dentist, where trust in the dentist was decisive.

Also dental anxiety for the treatment was seen as a minor problem which also was considered dependent on their trust in the dentist, although some of the patients in other circumstances had been very reluctant to dental treatment because of anxiety for injections or visible blood.

“Trust in the dentist is the most important thing, yes it is. You feel that this is right, wow, it was like a burden was taken from my shoulders.”
Going through with the treatment
When having to live with deteriorated dental health or with dentures the participants did their outmost to hide their situation from others. However, the participants seemed to have no problems telling workmates or friends as soon as the implant treatment was scheduled.

The participants were very satisfied with the result of the implant treatment, feeling restored in oral function and aesthetics and giving a regained self-confidence and self-esteem. Some of the participants put the oral-facial aesthetics forward as the most important factor for self-confidence. The totally dominant opinion was the feeling that implant supported fixed partial dentures felt better than a conventional fixed partial denture and was comparable to their own natural teeth. The treatment outcome was described by all the informants as a substantial improvement in oral comfort and in quality of life even though some of the participants described pain after the implant operation, and some had experienced difficulties with implants which did not integrate, giving prolonged treatment and re-operations. No one described this as giving any negative influence on their opinion of the treatment, which they all considered as a success. Those who had experienced disintegrated implants did all blame themselves of causing this unsuccessful osseointegration. No one considered this as a result of poor management from the dentist.

Some of the participants described that they had dental anxiety before the operations but no one considered the treatment as painful or complicated although some informants lost implants and had to be re-operated.

“I read in the papers about Bengt Feldreich (Swedish celebrity), he had made this operations and it came out very well. And he was old at the time. And then I thought that if he could do it, I can.”

Becoming the person I once was
Being free from the prison of pain and social stigma
The participants stated a great improvement/recovery in oral health related quality of life and were readily prepared to recommend implant treatment and their dentist to others in spite of some
complications. The participants said that their psychological, physical and social wellbeing was considerably improved. They claimed that they regarded their implant supported fixed dentures as their own genuine teeth and that it felt and functioned physically as their own natural teeth. For example, the ability of sensing different food tastes which were highly diminished while wearing a removable denture, according to all of the participants, was regained after the treatment. The sense of regained security was very common, the participants witnessed about being able to sneeze, cough, and their social contacts were no longer restrained because of the fear of dropping their denture while eating among others.

A couple of the participants put forward the lack of oral-facial aesthetics when having dentures as highly important and felt that they after the treatment had regained their looks and self-esteem. A fixed implant-supported denture was compared with having own natural teeth also when it came to aesthetics.

“When you look yourself in the mirror and see all the tooth gaps – that really takes your self-esteem down, and now I feel like a whole person, Self-esteem is totally dependent of aesthetics”.

“It was so fun getting my new teeth. The first thing I did on that day was to go to a restaurant”.

**Having feelings of gratitude**

All the participants spontaneously expressed gratitude to the dentist and his/hers staff.

For those who had had recurrent infections, loose teeth, or badly functioning dentures, the fixed implant supported denture gave the patients the feeling of good dental status and of being orally healthy for the first time for many years. They did not have to visit their dentist as often as before and they were pain-free. The fixed dentures felt as their own natural teeth and they felt orally healthy.

“He should have applause”

“It’s the best thing that has happened to me, ever”.
Being caught by a more realistic perspective

*Being hit by the pale cast of thought*

Sometime after the treatment and the feelings of becoming the person they once was and feelings of gratitude, the participants started to be aware of minor negative side effects of the implants. When first asking for any discomfort from the implant supported fixed dentures all the participants expressed that the problems were very small. But when discussing this further, most of the participants found it difficult to keep optimal dental hygiene. Those informants who received a fixed implant supported denture in the upper jaw reported difficulties in speech. This seemed to diminish over time, though. Some felt that they had too many teeth and that an increased saliva production had become somewhat annoying. Most of the patients had accidently bit their tongue or cheek at some times.

“I’m totally satisfied but it’s a bit difficult to keep the oral hygiene up”.

“It’s a bit difficult with the speech, and I get rather much saliva”.

**Discussion**

All of the informants in this study had experienced a deteriorating dental status followed by a period of wearing a removable denture, except one informant who did not have any teeth nor removable denture. The consequences for the oral functions were severe and made most informants reduce their social interactions and contacts. Their image of themselves changed and they felt as deviating and uncertain persons, similar to the results from another study by Trulsson (Hallberg). Both this and our present study show how informants with removable dentures developed avoiding strategies in order to ensure that no one would notice the denture. In order to manage uncertainty they often avoided social contacts, especially when eating. These avoiding social contacts strategies contributed to restricted social participation and a change in self-image.

The use of the grounded theory method in this study revealed the importance of the patient’s trust in the dentist as the core category and main finding. This trust seems to be vital to make the patient choose, accept and go through with the treatment, perhaps even more so making the patient more likely to be satisfied with the
treatment result. This expression of trust in the dentist was common even from those informants who had experienced complications. They thought themselves to be the cause of these complications, and no one questioned the dentists’ skills or management.

The design of a qualitative study includes control of quality in all phases from research question, research approach, data collection and analysis. This study is based on an extensive amount of data, more than 150 pages, from a heterogeneous group strategically selected from the patient register. Data collection continued until saturation was reached and no additional information was gained. This sampling procedure is considered as being closely related to internal validity. The emerging categories, describing trust and confidence in the dentist, were all grounded in data and the quotations given are intended to show the trustworthiness of our interpretation. External validity concerns transferability to a new context. Our opinion is that the results from this study could be transferable to other groups treated with implant-supported fixed dental prostheses with similar characteristics to our study group. As stated in a previous study in this series of papers, there was a huge increase in interest for implant treatment from 1989 to 1999. Almost all (95%) of the study population expressed desire for implant treatment in 1999, a strongly increase and one of the main findings in this series of studies. This implies a high possibility that the results from this present study could be applicable to a larger extent. However, we do not in this study include patients not able to be successfully treated with fixed implant prosthesis, nor did we include informants who had to pay the full cost of the treatment.

It is important for qualitative studies to identify preconceptions which might bias the interview. The interviews were conducted by a dentist who could influence the patients’ answers. People might answer a dentist differently than they do to e.g. a social scientist. Dentists are often not very familiar with the interview technique and not used to guide the interview with questions related to a problem or a treatment. On the other hand, the dentist may be able to go deeper into questions regarding treatment, and complications. The results from this study show, in many aspects, similar results as a study by Trulsson (Hallberg) et al where the interviews were conducted by a social scientist. This indicates of a good validity.
for the present study. In both studies, though, the patients were referred to a specialist clinic which could mean a risk for bias. Most of the patients were referred because the general practitioner did not perform implant treatment and not because of any anticipated specific treatment difficulty. This should mean that the patients in many aspects are similar to most implant treatment patients.

The result in this study differs from the results of another qualitative study that showed that patients with chronic periodontitis shared the opinion that they had to depend on the care provider independently, whether they agreed to the treatment plan or not. The patients also had difficulties to foresee the result of the treatment.\(^{18}\) A conclusion from the study with these patients with periodontal disease was the importance of giving thorough information about the planned treatment and to give much attention to the patients’ individual needs. In our study, the informants described information regarding treatment and costs as very good, and also that there were a thorough individual preparation before treatment giving a deep trust in the dentist and the staff.

The differences in these studies can depend on several factors, besides the eventual difference in information and mutual discussion pattern. The trust in the dentist could also be the result of a long treatment period and long treatment sessions, which most often is the case in implant treatment. This has in other studies been shown to have an impact of the patients’ relation to and experience of the treatment result.\(^{19,20}\) The possibility to freely discuss the treatment options and to be given the opportunity of talking about psychosocial factors has previously been put forward as important for the subjective opinion of the prosthetic treatment.\(^{21}\) The patient panorama could also be somewhat different in our study with implant treatment patients compared to the other study with patients with a periodontal disease. The treatment outcome could also in many implant treatment cases be more easily described with a higher degree of prognostic accuracy than for periodontal disease.

The oral-facial aesthetics seems to be of definitely higher importance than good dental function for some of the informants, which also has been described in other studies.\(^{22}\) These patients expressed that their self-esteem and self-confidence were severely depressed by having tooth gaps, even when they were only visible
for themselves. This is in accordance with another study where the eventuality of losing a tooth or getting dentures was compared to being unemployed.\textsuperscript{23} The informants in our study described the feeling of being restored and regaining self-esteem when they once again got fixed teeth.

The informants were asked if there were any obstacles, gatekeepers, in the decision making process. The two factors mentioned were cost and dental anxiety, but neither was described as of importance. Two of the informants had hesitated for a period of time to choose implant treatment because of the cost but had all the time been determined to go through with the treatment later. Some of the other informants had been prepared to take a bank loan but chose not to while the total cost showed to be much less than they had anticipated. This opinion that the total cost was not as high as they thought was unanimous for all the informants. The pre-treatment cost estimation showed to have good accuracy which strengthened the confidence in the dentist and his/her staff. A weakness of the study is that these patients had passed the gatekeeping process and expressed demand. A study of needy patients not demanding implant treatment would be of great interest but outside the scope of this study.

However, a new regulation was introduced in the National Dental Insurance System in Sweden a few years ago. The regulation permitted highly subsidised treatment costs for prosthodontic services. The cost for dental implant therapy is low in an international perspective. It is likely that this might have an impact on the desire of implant treatment although most of the informants declared that they would desire this treatment regardless of cost and were prepared to take a bank loan, if necessary. A pointer of importance is though that the participants in this study was referred to a specialist clinic with the pronounced intention of having dental implant treatment and were to some degree prepared for the cost and the different sections of the treatment. Those without the economical prerequisite had probable declined the offer of referral.

Some of the informants described having dental anxiety previously but had gone through with the treatment without hesitation because of the pre-treatment information which was considered very accurate.
Cost and dental anxiety have earlier been discussed as important and perhaps this is the case for many dental treatments, but not for this study group. However, when asked if they knew of any friends or acquaintances that had declined from implant treatment because of cost or dental anxiety there seemed to be very few such cases. Still, the gatekeeping may occur long before contact is taken with dental care, which of course is not perceived in the care system, even less in a specialist clinic. A recent qualitative study from Britain among elderly emerged two main themes; patients’ fear and anxiety (relating to the pain of surgery, complications of the procedure and immediate post-surgical denture use), and the appropriateness of the procedure in an elderly person. The impact of cost was not included in this study. This difference compared to our study could in part depend on age and cultural differences (appropriateness for an elderly person). Our study group were younger and perhaps are also implant treatment a more commonly accepted treatment option in Sweden, regardless of age. Another reason for difference could be that the informants in our study concerned treated patients’ and had concluded their decision making process, and the reported confidence in their dentist making dental anxiety a minor concern.

Another study has claimed that implant supported fixed dentures makes the patient regain health and function to a higher degree than with fixed partial dentures or removable dentures. The results in our study confirms this. This is also in line with yet another qualitative study regarding eating indicating that implant supported mandibular overdentures gave a significant improvement compared to informants with adjusted prostheses. The informants in our study unanimously declared the feeling that implant supported fixed partial dentures felt better than a conventional fixed partial denture and was comparable to their own natural teeth.

Everyone in the study group who had used a removable denture (all but one), reported an obvious decrease of the ability to sense food tastes. This effect of the removable denture was considered as a clear decrease in quality of life. After receiving the implant supported fixed denture, the ability of sensing food tastes was regained.

The percentage of elderly individuals without teeth and wearing removable dentures has dramatically decreased in Sweden during the last decades. On the other hand there is today a higher share
of the population getting older, and they will probably face the risk of losing their teeth at a higher age. This is also proposed to be the case in other parts of the industrialized world, e.g. in the United States.\textsuperscript{28} This means that in a foreseeable future there will be many patients with dentures and probably desiring for implant supported dentures.

In line with the results from the present and other studies, it should be politically urgent to make it possible for those of the denture wearers who cannot accept their denture, to have the opportunity to get subsidized dental implant treatment within the national insurance system. Our study shows the importance of giving patients the opportunity of regaining self-esteem and becoming the person they once was with the feeling of social security, regained attraction and a good dental status.

**Conclusion**

The core category and main finding were the importance of the patients’ trust and confidence in the dentist and his/her staff in the process of transforming desire for dental implant treatment into a manifest demand, and in making it more likely for the patients’ to become satisfied with the treatment result regardless of complications. Mutual discussions in the treatment planning process, primarily good pre-treatment information, and accurate cost estimation were reasons for developing this trust and confidence. Experienced complications like disintegrated implants was not considered as a result of bad management from the dentist, instead the participants put the blame on themselves.

All of the informants had considered implant treatment for some time and made their decision when they felt confident in the dentist and after discussions with their family and with the dentist.

None of two identified gatekeeping factors, cost and dental anxiety were important for the decision of getting implant treatment. No other gatekeeping factors were put forward by the informants in this study.

A great improvement/recovery in oral health related quality of life was stated in terms of regaining the feeling of self-esteem and being secure in social relations. The ability of sensing different food tastes was also regained after implant treatment and the perception of the
implant supported fixed denture was the same as of own natural teeth.

**Acknowledgment**

This study was supported by The Public Dental Health Services, Uppsala County Council, Sweden.

**Referenser:**


Table 1
**Dental situation of the informants**
Patients part of the cost differs because of individual prerequisites which influences the subsidized part from the National Dental Insurance System in Sweden

<table>
<thead>
<tr>
<th>Pat no; age; genus: Male/ Female</th>
<th>Number of impl.; Jaw-Upper/Lower</th>
<th>Major complications: Failed osseo-integration, Bone-augmentation, Fractured Superstructure</th>
<th>Year of implant treatment</th>
<th>Cost (1000 SEK; approx. 7 SEK for 1 USD): Total and patients’ part; Subjective opinion of cost: Not important, Hesitated, Great Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: 70; F</td>
<td>6 impl:U</td>
<td></td>
<td>2009</td>
<td>58 resp 24; Not</td>
</tr>
<tr>
<td>2: 84; M</td>
<td>6 impl:U</td>
<td></td>
<td>2009</td>
<td>72 resp 19; Not</td>
</tr>
<tr>
<td>3: 75; F</td>
<td>6 impl:U; 5 impl:L</td>
<td>Bo</td>
<td>2008</td>
<td>164 resp 27; Hes</td>
</tr>
<tr>
<td>4: 68; M</td>
<td>4 impl:U; 3 impl:L</td>
<td>F:1 impl</td>
<td>2008</td>
<td>108 resp 32; Not</td>
</tr>
<tr>
<td>5: 67; M</td>
<td>4 impl:U</td>
<td></td>
<td>2008</td>
<td>110 resp 28; Not</td>
</tr>
<tr>
<td>6: 64; F</td>
<td>5 impl:U</td>
<td>F:3 impl</td>
<td>2008</td>
<td>46 resp 16; Not</td>
</tr>
<tr>
<td>7: 76; F</td>
<td>6 impl:U; 5 impl:L</td>
<td></td>
<td>2009</td>
<td>132 resp 24; Not</td>
</tr>
<tr>
<td>8: 71; F</td>
<td>6 impl:U</td>
<td>F:1 impl</td>
<td>2009</td>
<td>67 resp 24; Not</td>
</tr>
<tr>
<td>9: 61; M</td>
<td>2 impl:U; 2 impl:L</td>
<td></td>
<td>2009</td>
<td>73 resp 33; Not</td>
</tr>
<tr>
<td>10: 54; F</td>
<td>4 impl:U</td>
<td>Su</td>
<td>2009</td>
<td>85 resp 42; Imp</td>
</tr>
<tr>
<td>A JOURNEY FROM SOCIAL STIGMA TO EXHILARATION WITH TRUST AND CONFIDENCE IN THE DENTIST AS CENTRAL PART</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Becoming an unsecure person</strong></td>
<td>Decreasingly worsened oral health</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Living in pain and anxiety</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Becoming a determined person</strong></td>
<td>Desire for a better solution turn in demand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Having trust in the dentist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Going through with the treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Becoming the person I once was</strong></td>
<td>Being free from the prison of pain and social stigma</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Having feelings of gratitude</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Being caught by a more realistic perspective</strong></td>
<td>Being hit by the pale cast of thought</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
INFORMATION
om forskningsprojekt

Folktandvården i Uppsala bedriver ett gemensamt forskningsprojekt, tillsammans med Högskolan i Malmö, som syftar till att beskriva behov och efterfrågan av tandvård och då speciellt implantatbehandling.

Behov och efterfrågan av tandvård har ändrats avsevärt under de senaste decennierna. Nya behandlingsmetoder som implantatbehandling har blivit vanliga och påverkande faktorer som bl.a. tandläkarens kunskaper har ändrats. Men även många andra faktorer inverkar på vilken behandling som väljs, som t.ex. inställning till vård, kostnader och väntetider.

Syftet med detta forskningsprojekt är att undersöka vad som får patienter att välja, eller inte välja, implantatbehandling vid avsaknad av tänder.

Du hör till de patienter som fått behandling på Specialisttandvården i Uppsala och vi har fått Ditt namn via klinikens patientregister. Du tillfrågas om du vill delta i studien.

Den planerade studien kommer att ske genom att en intervju genomförs på en överenskommen plats i Uppsala. Någon klinisk undersökning kommer inte att ske. Intervjun kommer att ta cirka 45 min till 1 timme där ljudinspelning sker. Detta sker för att undvika risken att inte hinna med att notera vad som sägs vid intervjun. Intervjun kommer därefter att skrivas ut men i avidentifierad och kodad form.

Materialet från Din intervju kommer att hanteras med sekretess och förvaras inlåst utan möjlighet att identifiera utan en kodnyckel som kommer att förvaras separat. Materialet kommer inte att lämnas vidare till några externa uppdragsgivare och kommer att behandles så att inga obehöriga kan ta del av dem. Ansvarig för dina personuppgifter är Malmö Högskola.


Sammanfattande resultat från intervjuerna kommer att publiceras i vetenskaplig tidskrift men utan någon möjlighet till att identifiera någon intervjuperson.

Om redovisning av statistik och forskningsresultat sker i andra sammanhang så kommer det enbart att ske i avidentifierat skick.
Intervjun kan när som helst avbrytas utan att något specifikt skäl behöver anges. Varje intervjuperson kanbestämma sig för att inte längre delta i studien, vilket naturligtvis kommer att respekteras. I så fall förstörs allt material från denna intervju. Vare sig Du deltar i studien eller ej, eller om Du väljer att avbryta intervjun, kommer inte att på något sätt påverka en eventuell framtida behandling på Specialisttandvården. Material från någon av intervjuerna är inte heller tillgängligt för någon på kliniken eller inom Folk tandvården.


Tack på förhand för Din medverkan. Om du har några frågor är du välkommen att kontakta mig per telefon eller e-post.

Birger Narby
Övertandläkare

Tel 018-611 63 80

Jag är tacksam om du inom en vecka returnerar det bifogade samtyckesformuläret i det bifogade kuvertet. Om du samtycker till intervjun så kommer jag att kontakta dig för att bestämma tid och meddela plats för intervjun. Om du inte vill delta i studien så skriv det bredvid din namnteckning.

Med vänlig hälsning

Birger Narby
Tandläshet och att få implantat - patientens upplevelser

- Du har relativt nyligen genomgått en behandling på Specialisttandvården inom Folk tandvården i Uppsala och fått en käkbensförankrad bro. Skulle Du vilja berätta för mig om det?

- Vad var det som gjorde att Du bestämde Dig för att genomgå den här behandlingen och skaffa en käkbensförankrad bro?

- Vad innebär det för Dig att ha fått en käkbensförankrad bro? Vilka för respektive nackdelar upplever Du?

- Hur har Din livskvalitet påverkats av den här behandlingen?

- Hur upplever du att Din munhälsa är nu efter behandlingen? Hur var Din munhälsa innan behandlingen?
Undersökning av inställningen till tandvård och behovet av tandersättningar i Örebro län

1. Kön
   Man □
   Kvinna □

2. Födelsår: ______________

3. Boendeort:
   Stad □
   Mindre samhälle □
   Landsbygd □

4. Yrke:
   (ange så noggrant som möjligt, inte bara titel. För pensionär, ange tidigare yrke)

___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________
________________________________________

Arbetsgivare

___________________________________________________________________________
___________________________________________________________________________

Egen företagare  Ja □    Nej □

5. Vilken utbildning har Du?

   Folkskola/grundskola □
   Gymnasium □
   Högskoleutbildning □

Annan utbildning (Ange vilken)

___________________________________________________________________________
___________________________________________________________________________
6. Vilket civilstånd har Du?

- Gift/sammanboende
- Ensamstående
- Ogift
- Frånskild
- Änka/änkling

7. Din egen årsinkomst före skatt för närvarande:

Ungefär _______________ kr

8. Ditt hushålls sammanlagda årsinkomst före skatt för närvarande:

Ungefär _______________ kr

9. När undersöktes Du senast av tandläkare?

- För mindre än 1 år sedan
- För 1 – 3 år sedan
- För 3 – 5 år sedan
- För mer än 5 år sedan

10. Är du nöjd med Dina tänder?

- Ja
- Nej

(Om du svarar Nej): Vad upplever Du som problem med Dina tänder?

________________________________________________________________
________________________________________________________________
________________________________________________________________

11. Kan Du tugga all sorts mat?

- Mycket bra
- Ganska bra
- Mindre bra
- Dåligt

| a. Att ha vackre och perfekta tänder är mycket viktigt för hur man blir bemött av andra människor. | __________________ | __________________ |
| b. De spelar ingen roll hur man ser ut i munnen, bara man kan tugga den mat man tycker om. | __________________ | __________________ |
| c. Mindre skönhetskfl på tänderna har ingen betydelse, bara de fungerar. | __________________ | __________________ |
| d. En tandlöshet som syns är något man bör skämmas för. | __________________ | __________________ |
| e. Glappande löständer kan se löjligt ut. | __________________ | __________________ |
| f. Tandlöshet som syns förekommer nästan bara hos socialt utslagna. | __________________ | __________________ |
| g. Att ha löständer är mycket besvärligt vid kontakt med det motsatta könet. | __________________ | __________________ |

13. Har Du alla Dina ursprungliga tänder i behåll?

Ja □ 

Nej □ 

□ → Gå till fråga 14

□ → Gå till nästa sida

**Ursprungliga tänder:** Dina permanenta tänder, alltså ej mjölktänder. Normalt 28-32 stycken. Hit räknas också de tänder som har lagningar, jacketkronor, stifttänder eller liknande, där någon del av den ursprungliga tanden finns kvar.

**Ersättning:** Alla fastsittande eller avtagbara konstruktioner som helt ersätter saknade tänder, dvs där ingen del av den saknade tanden finns kvar. Det kan vara bro/brygga, implantat, delprotes eller helprotes.

**Implantatbehandling:** Som ersättning för saknade tänder kan man numera i många fall sätta in s k implantat, skruvar av metallen titan som förankras i käkbenet. På dessa kan man sedan sätta konstgjorda tänder, som alltså sitter fast.


---

<table>
<thead>
<tr>
<th>Alternativ</th>
<th>Överkäke</th>
<th>Underkäke</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Jag saknar någon enstaka tand (ej visdomstand) och har ingen ersättning för den</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>b. Jag saknar flera tänder (ej visdomständer och har inga ersättningar för dem)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>c. Jag saknar alla tänder i angiven käke och har inga ersättningar för dem</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>d. Jag har fast ersättning (bro/brygga)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>e. Jag har implantat (käkbensförankrad bro)</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>f. Jag har avtagbar delprotes</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>g. Jag har helprotes</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>

14. (Denna fråga besvaras endast av Dig som har de ursprungliga tänderna i behåll)

Om Du skulle förlora någon eller några tänder, vilken typ av behandling skulle Du föredra? Ange endast ett av nedanstående alternativ.

- Fast bro/brygga  □
- Avtagbar protes  □
- Implantat        □
- Ingen behandling □
15. (Denna fråga besvaras endast av Dig som har de ursprungliga tänderna i behåll)

Om Du skulle förlora **alla** tänder i någon käke, vilken typ av behandling skulle Du föredra? Ange endast ett av nedanstående alternativ för varje käke.

<table>
<thead>
<tr>
<th>Överkäke</th>
<th>Underkäke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast bro/brygga (kan inte göras)</td>
<td>☐ ☐</td>
</tr>
<tr>
<td>Implantat</td>
<td>☐ ☐</td>
</tr>
<tr>
<td>Avtagbar protes</td>
<td>☐ ☐</td>
</tr>
<tr>
<td>Ingen behandling</td>
<td>☐ ☐</td>
</tr>
</tbody>
</table>

16. (Denna fråga besvaras endast av Dig som har de ursprungliga tänderna i behåll. Gå sedan till fråga 22!)

Om Du **inte** vill ha implantatbehandling, vilket eller vilka av följande alternativ stämmer bäst in på Dig?

- Onödigt att göra något åt tandförlusten ☐
- Implantat är ett för stort ingrepp i kroppen ☐
- Implantat för dyrt ☐
- Jag är rädd för operationerna ☐
- Jag är rädd för okända biverkningar av implantat ☐
- Det räcker bra med vanliga löständer ☐

Annan

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

17. (Denna fråga besväras endast av Dig som saknar en eller flera tänder och inte har ersättning för dem. Har Du någon form av ersättning, gå i stället till fråga 20)

Varför har Du ingen ersättning för Din tandförlust? Ange ett eller flera av nedanstående alternativ.

- Har inte velat ha någon ersättning ☐
- Behandling för kostsam ☐
- Har försökt bära löständer, men har inte fungerat ☐
- Har avrättats av tandläkare ☐
- Jag är rädd för tandbehandling ☐
18. (Denna fråga besväras endast av Dig som saknar en eller flera tänder och inte har ersättning för dem. Har Du någon form av ersättning, gå i stället till fråga 20)

Vill Du ha implantatbehandling för Din tandförlust, om sådan behandling är möjlig?

Ja  □ → Gå till fråga 22
Nej □ → Gå till fråga 19

19. Denna fråga besväras endast av Dig som saknar en eller flera tänder och inte har ersättning för dem. Har Du någon form av ersättning, gå i stället till fråga 20)

Om Du inte vill ha implantatbehandling, vilket eller vilka av följande alternativ stämmer bäst in på Dig?

Onödigt att göra något åt tandförlusten □
Implantat är ett för stort ingrepp i kroppen □
Implantat för dyrt □
Jag är rädd för operationerna □
Jag är rädd för okända biverkningar av implantat □
Det räcker bra med vanliga löständer □

Annat


20. (Denna fråga besvaras endast av Dig som saknar en eller flera tänder och redan har någon ersättning för dem. Övriga, gå till fråga 22)

Skulle Du vilja ha implantat i stället för den ersättning Du redan har?

Ja  □ → Gå till fråga 22
Nej □ → Gå till fråga 21
21. (Denna fråga besvaras endast av Dig som saknar en eller flera tänder och redan har någon ersättning för dem. Övriga, gå till fråga 22)

Om Du inte vill ha implantatbehandling, vilket eller vilka av följande alternativ stämmer bäst in på Dig?

- Implantat är ett för stort ingrepp i kroppen □
- Implantat för dyrt □
- Jag är rädd för operationerna □
- Jag är rädd för okända biverkningar av implantat □
- Den ersättning jag har fungerar bra □

Annan

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

22. (Denna och följande frågor besvaras av alla)

Är Du allmänt nöjd eller missnöjd med den tandvård Du har erhållit tidigare?

- Mycket nöjd □
- I stort sett nöjd □
- Ganska missnöjd □
- Mycket missnöjd □

23. Har Du i huvudvärk fått tandvård hos privattandläkare eller hos folktandvården?

- Privattandvård □
- Folk tandvård □

24. Har Du i allmänhet haft möjlighet att besöka den tandläkare Du önskat få behandling av?

- Alltid □
- Ofta □
- Ibland □
- Sällan □
- Aldrig □

<table>
<thead>
<tr>
<th></th>
<th>Instämmer absolut</th>
<th>Instämmer absolut</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>inte</td>
<td>inte</td>
</tr>
<tr>
<td>a. Alla borde ha helt gratis tandvård</td>
<td>[ ] [ ]</td>
<td></td>
</tr>
<tr>
<td>b. All tandvård borde drivas av landsting</td>
<td>[ ] [ ]</td>
<td></td>
</tr>
<tr>
<td>c. Tandvård bör betalas på samma sätt som annan sjukvård.</td>
<td>[ ] [ ]</td>
<td></td>
</tr>
<tr>
<td>d. Tandvårdsförsäkringen är bra som den är</td>
<td>[ ] [ ]</td>
<td></td>
</tr>
<tr>
<td>e. Det är viktigare att resurser satsas på hjärtbyten än på tandvård</td>
<td>[ ] [ ]</td>
<td></td>
</tr>
<tr>
<td>f. Samhället borde inte betala något för sådan tandvård som görs för utseendet skull</td>
<td>[ ] [ ]</td>
<td></td>
</tr>
</tbody>
</table>

**Tack för din medverkan!**
UNDERSÖKNING AV INSTÄLLNINGEN TILL TANDVÅRD OCH TANDERSÄTTNINGAR

Inom tandvården har många nya metoder utvecklats under senare år. En sådan ny teknik är insättning av implantat i stället för tänder som förlorats. Denna metod innebär att man i många fall kan få en fast ersättning i stället för avtagbar protec. "Löständer" kan alltså undvikas. Behandling med implantat är dock mycket kostsam både för patient och samhälle.


Vad anser Du nu, hur har det gått med Dina länder och de ersättningar Du eventuellt haft eller har? Det är viktigt för oss med kunskap om frågor som dessa, särskilt nu när tandvårdsförsäkringen är under förändring.

Du blev förra gången slumpmässigt utvald att ingå i undersökningen. Nu vill vi be Dig att så snart som möjligt fylla i formuläret och sända tillbaka det i bifogat portofritt svarskuvert. Deltagande i undersökningen är givetvis helt frivilligt. Det är dock viktigt för möjligheterna att dra slutsatser från undersökningen att så många som möjligt besvarar enkäten.

De svar som lämnas skyddas av Sekretesslagen (Sekretesslagen 9 kap 4 § och sekretessförordningen 3 §). Bearbetningen av undersökningen kommer att ske på sådant sätt att uppgifterna i dataregistren och resultaten i redovisningen inte kan kopplas till någon enskild individ. Ditt namn och adress har vi fått från befolkningsregistret.

Om Du har frågor eller synpunkter på undersökningen kan Du ringa oss eller tandsköterska Solveig Näsström-Nilsson, tel 040-322123, kl 8-16 måndag till fredag.

Vi tackar på förhand för Din medverkan

Sigvard Palmqvist
Professor
tel:00945-35326745

Björn Söderfeldt
Professor
040-322218
<table>
<thead>
<tr>
<th></th>
<th>Först kommer några frågor om Din tandvård och hur Du upplever Dina tänder.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>När undersöktes Du senast av tandläkare?</td>
</tr>
<tr>
<td></td>
<td>1. För minde än 1 år sedan □</td>
</tr>
<tr>
<td></td>
<td>2. För 1 – 3 år sedan □</td>
</tr>
<tr>
<td></td>
<td>3. För 3 – 5 år sedan □</td>
</tr>
<tr>
<td></td>
<td>4. För mer än 5 år sedan □</td>
</tr>
<tr>
<td></td>
<td>5. Har ej undersökts □</td>
</tr>
<tr>
<td></td>
<td>6. Minns ej □</td>
</tr>
<tr>
<td>2.</td>
<td>När undersöktes Du senast av tandhygienist eller profylaxtandsköterska?</td>
</tr>
<tr>
<td></td>
<td>1. För minde än 1 år sedan □</td>
</tr>
<tr>
<td></td>
<td>2. För 1 – 3 år sedan □</td>
</tr>
<tr>
<td></td>
<td>3. För 3 – 5 år sedan □</td>
</tr>
<tr>
<td></td>
<td>4. För mer än 5 år sedan □</td>
</tr>
<tr>
<td></td>
<td>5. Har ej undersökts av någon av dessa □</td>
</tr>
<tr>
<td></td>
<td>6. Minns ej □</td>
</tr>
<tr>
<td>3.</td>
<td>Var har Du de senaste fem åren huvudsakligen fått tandvård?</td>
</tr>
<tr>
<td></td>
<td>1. Privattandvård □</td>
</tr>
<tr>
<td></td>
<td>2. Folktandvård □</td>
</tr>
<tr>
<td></td>
<td>3. Både privat- och folktandvård □</td>
</tr>
<tr>
<td></td>
<td>4. Ej fått tandvård □</td>
</tr>
<tr>
<td>4.</td>
<td>Ungefär hur ofta går Du till tandvård?</td>
</tr>
<tr>
<td></td>
<td>1. Två eller fler gånger/år □</td>
</tr>
<tr>
<td></td>
<td>2. En gång/år □</td>
</tr>
<tr>
<td></td>
<td>3. Vartannat år □</td>
</tr>
<tr>
<td></td>
<td>4. Mer sällan □</td>
</tr>
<tr>
<td>5.</td>
<td>Ungefär hur mycket har Du själv betalat för Din tandvård de senaste tolv månaderna?</td>
</tr>
<tr>
<td></td>
<td>1. Inget alls □</td>
</tr>
<tr>
<td></td>
<td>2. Mindre än 300 kr □</td>
</tr>
<tr>
<td></td>
<td>3. 300 – 1000 kr □</td>
</tr>
<tr>
<td></td>
<td>4. 1001 – 2000 kr □</td>
</tr>
<tr>
<td></td>
<td>5. 2001 – 5000 kr □</td>
</tr>
<tr>
<td></td>
<td>6. Mer än 5000 kr □</td>
</tr>
<tr>
<td>6.</td>
<td>Är Du allmänt nöjd eller missnöjd med den Tandvård Du har erhållit tidigare?</td>
</tr>
<tr>
<td></td>
<td>1. Mycket nöjd □</td>
</tr>
<tr>
<td></td>
<td>2. I stort sett nöjd □</td>
</tr>
<tr>
<td></td>
<td>3. Mindre nöjd □</td>
</tr>
<tr>
<td></td>
<td>4. Ganska missnöjd □</td>
</tr>
<tr>
<td></td>
<td>5. Mycket missnöjd □</td>
</tr>
<tr>
<td>Nummer</td>
<td>Fråga</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------</td>
</tr>
<tr>
<td>7.</td>
<td>Har Du någon gång under de senaste fem åren bytt eller velat byta tandläkare därför att Du varit missnöjd?</td>
</tr>
<tr>
<td>8.</td>
<td>Är Du allmänt nöjd med Dina tänder?</td>
</tr>
<tr>
<td>10.</td>
<td>Om Du har tandersättning i form av fast bro/brygga eller avtagbar protes, är Du allmänt nöjd eller missnöjd med den?</td>
</tr>
<tr>
<td>12.</td>
<td>Har Du under de senaste tolv månaderna någon gång varit sjukskiven på grund av problem med Din mun eller Dina tänder?</td>
</tr>
</tbody>
</table>

12 a. Om ja, ungefär hur många dagar? ___________________ dagar

<table>
<thead>
<tr>
<th>Alla påståenden</th>
<th>Instämmer absolut</th>
<th>Instämmer absolut</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Att ha vackra och perfekta tänder är mycket viktigt för hur man blir bemött av andra människor.</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>b. De spelar ingen roll hur man ser ut i munnen, bara man kan tugga den mat man tycker om.</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>c. Mindre skönhetsfel på tänderna har ingen betydelse, bara de fungerar.</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>d. En tandlöshet som syns är något man bör skämmas för.</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Besvär</th>
<th>Inga besvär</th>
<th>Vissa besvär</th>
<th>Ganska mycket besvär</th>
<th>Stora besvär</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tändernas färg</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Tändernas form</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Sneda tänder</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Över- eller underbett</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>För glest mellan tänderna</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>För trångt mellan tänderna</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Sveda i munnen</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Sår eller blåsor i munnen</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Smärtor runt käklederna</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Knäppningar/knaster från käklederna</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Svårigheter att gapa stort</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Tandgnissling/pressning</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Blödning från tandköttet</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Dålig andedräkt</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Tandvärd</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
<tr>
<td>Ilningar i tänderna</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Alternativ</th>
<th>Överkäke</th>
<th>Underkäke</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a. Jag har alla ursprungliga tänder i behåll</strong> (visdomständer räknas inte)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>b. Jag saknar någon enstaka tand (ej visdomstand) och har ingen ersättning för den</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>c. Jag saknar flera tänder (ej visdomständer och har inga ersättningar för dem)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>d. Jag saknar alla tänder i angiven käke och har inga ersättningar för dem</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>e. Jag har fast ersättning (bro/brygga)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>f. Jag har implantat</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>g. Jag har avtagbar delprotes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>h. Jag har avtagbar helprotes</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

16. Du som helt eller delvis saknar tänder i någon käke, vill Du allmänt ha implantatbehandling om det tekniskt möjligt?

<table>
<thead>
<tr>
<th>Alternativ</th>
<th>Överkäke</th>
<th>Underkäke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ja, absolut</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ja, troligen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varken ja eller nej</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nej, troligen inte</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nej, absolut inte</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Saknar inte tänder</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

17. Du som delvis saknar egna tänder och idag har en avtagbar delprotes, skulle Du istället vilja ha behandling med implantat, om det är möjligt?

<table>
<thead>
<tr>
<th>Alternativ</th>
<th>Överkäke</th>
<th>Underkäke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ja</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nej</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osäker</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Har ej avtagbar delprotes</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
18. Du som helt saknar egna tänder i någon eller båda käkarna och idag har en avtagbar helprotes, eller saknar ersättning, skulle Du vilja ha behandling med implantat, om det är möjligt?

<table>
<thead>
<tr>
<th></th>
<th>Överkäke</th>
<th>Underkäke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ja</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nej</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osäker</td>
<td></td>
<td></td>
</tr>
<tr>
<td>År ej helt tandlös i denna käke</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


- Har inte velat ha någon ersättning
- Behandling för kostsam
- Har försökt bära löständer, men det har inte fungerat
- Har avrätts av tandläkare
- Har avstått på grund av rädsla för tandbehandling
- Saknar inte tänder utan att de är ersatta

20. Om Du som har egna tänder skulle förlora någon eller några tänder, vilken typ av behandling skulle Du föredra? *Ange endast ett alternativ för varje käke.*

<table>
<thead>
<tr>
<th></th>
<th>Överkäke</th>
<th>Underkäke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fast bro/brygga på egna tänder</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avtagbar protes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Krona/bro på implantat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ingen behandling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>År redan helt tandlös i denna käke</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th></th>
<th>Överkäke</th>
<th>Underkäke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avtagbar protes, ”löständer”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fast bro/brygga på implantat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avtagbar protes på implantat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ingen behandling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nej, absolut inte</td>
<td></td>
<td></td>
</tr>
<tr>
<td>År redan helt tandlös i denna käke</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
22. Om Du inte kan tänka Dig implantatbehandling, vilket eller vilka alternativ stämmer bäst in på Dig? *Flera alternativ kan anges.*

- Onödig att göra något åt tandförlusten
- Implantat är ett för stort ingrepp i kroppen
- Implantat är för dyrt
- Jag är rädd för operationerna
- Jag är rädd för okända biverkningar av implantat
- Behöver ingen ersättning
- Vill ha implantat

Annan skäl

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________


- Har förlorat en enstaka tand.
- Har förlorat några tänder
- Har förlorat de flesta tänderna i någon käke
- Har förlorat alla tänder i någon käke
- Bro/brygga har gått sönder
- Fått ny bro/brygga
- Fått ny avtagbar delprotes
- Fått helprotes
- Fått implantat
- Implantat har lossnat
- Haft ordentlig infektion/inflammation i munnen

Annan

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________

<table>
<thead>
<tr>
<th>Enhet</th>
<th>Instämmer absolut</th>
<th>Instämmer absolut</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>inte</td>
<td>inte</td>
</tr>
</tbody>
</table>

| a. Alla borde ha helt gratis tandvård |   |   |

| b. All tandvård borde drivas av stat, landsting eller kommun |   |   |

| c. Tandvård bör betalas på samma sätt som annan sjukvård. |   |   |

| d. Tandvårdsförsäkringen bör också täcka ersättningar av förlorade tänder |   |   |

| e. Det är viktigt att få ersättning för stora och kostsamma tandbehandlingar än för rutintandvård |   |   |

| f. Samhället bör inte betala något för sådan tandvård som görs för utseendet skull |   |   |

| **Till sist kommer några frågor om Dig själv, för att vi skall förstå bakgrunden till olika uppfattningar om tänder och tandvård.** |

25. Din boendeort:

- Storstad
- Storstadsförort
- Medelstor stad
- Mindre stad/samhälle
- Landsbygd

26. Vilken av följande yrkeskategorier passar bäst in på Ditt huvudsakliga yrke? (För pensionär, studerande eller arbetslös, ange tidigare yrke)

- Ej facklärd arbetare i industri eller tjänst
- Facklärd arbetare i industri eller tjänst
- Lågre tjänsteman
- Tjänsteman på mellannivå
- Högre tjänsteman eller fri yrkesutövare
- Egen företagare
27. Vilken är Din huvudsakliga sysselsättning?

- Arbetar heltid
- Arbetar deltid
- I arbetsmarknadspolitisk åtgärd
- Arbetslös
- Hemarbetande
- Studerande eller annat

28. Vilken eller vilka utbildningar har Du? *(Flera svarsalternativ är möjliga)*

- Folkskola/grundskola
- Realskola
- Folkhögskola, 2-årigt gymnasium
- 3- eller 4-årigt gymnasium
- Högskoleutbildning
- Anna utbildning (Ange vilken)

__________________________________________________________________________

29. Vilket civilstånd har Du?

- Gift/sammanboende
- Ogift/ensamboende

30. Ungefär vilken årsinkomst före skatt har Du för närvarande?

- Mindre än 100000 kr
- 101 - 150000 kr
- 151 – 200000 kr
- 201 - 250000 kr
- 251 – 300000 kr
- 301 – 350000 kr
- 351 – 400000 kr
- Mer än 400000 kr

Tack för din medverkan!
BIRGER NARBY

FACTORS SHAPING DEMAND FOR PROSTHETIC DENTISTRY TREATMENT WITH SPECIAL FOCUS ON IMPLANT DENTISTRY