

THE DEVELOPMENT OF MEASURES OF DENTAL  
IMPACTS ON DAILY LIVING

Anna Thereza Thome Leao

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Interesting  
discussion

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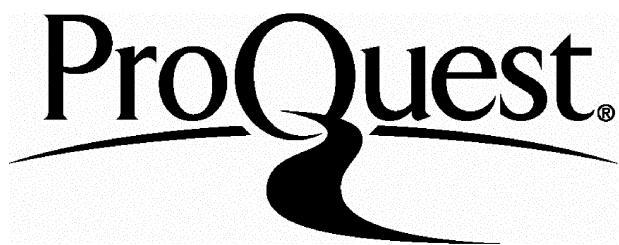
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## ABSTRACT

There is an increasing awareness of the need for measures of the social and psychological consequences of oral disorders. There are data on the social and psychological impacts of oral disease, but they do not measure the seriousness of the impacts. Therefore further research is needed on socio-dental indicators to develop simple, comprehensive, valid and reliable measures of dental functioning that can be linked to clinical status measures.

The main objective of this research is to develop a socio-dental method which includes measures of how oral health status affects the quality of daily living and links that to clinical status. The measure will include social and psychological dimensions as well as clinical measures. The hypothesis is that the degree of the impact of the mouth in terms of self-image, performance, comfort and symptoms affects people socially and psychologically. Based on categories developed by Cushing (1986), the Social Impact of Dental Disease, the questionnaire being proposed includes the following dimensions: appearance, pain, comfort, eating restriction and general performance.

The dimensions have been validated and reliability has been tested. Furthermore, utility weighting for questions is discussed. A final score for each dimension and for all dimensions together was calculated by summing question scores. From this three different groups were formed: the satisfied,

the relatively satisfied and the dissatisfied. Their clinical status was analyzed.

The questionnaire has been tested in Brazil, on a sample of 662 people, aged 35 to 44 years, of two social classes and both genders. The clinical oral measure used is the DMFT, and three groups have been selected : low, median and high DMFT.

This study presents a measure of how oral health is perceived and how it affects people's life, dealing equally with negative and positive contributions to quality of life. Combined with clinical status measures it should improve estimates of need.

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## CHAPTER 1

### LITERATURE REVIEW

#### 1.1. Introduction

In the last few decades it has been recognized that there is a need for global and individual health status indicators in addition to the traditional mortality and morbidity statistics (Andrews, 1981). As societies evolve, health problems alter in salience and new health indicators must be chosen to reflect changing health issues. The resolution of one type of health problem reveals a new layer of concerns. The identification of new concerns tends to increase the need for new indices of health to monitor progress towards the new goals, and so the cycle begins again. Rising expectations have led to a shift away from viewing health in terms of survival, through a phase of defining it in terms of freedom from disease, thence to an emphasis on the individual's ability to perform daily activities, and now to the current emphasis on positive themes of happiness, social and emotional well-being, and quality of life.

In the dental field, escalating costs, the emphasis on treating episodic illnesses and the realization that the health care system has less impact on health than socio-economic and lifestyle variables, are all factors which have contributed to the need to determine new measures of oral health (Nikiforuk and Nikiforuk, 1979).

Research on the design of health indicators has involved

collaboration between medical scientists and social scientists, with contributions drawn from economics, sociology and social psychology (Elinson, 1979). Indicators of health are chosen to reflect both problems of social concern and problems for which improvement is sought. One of the central issues that must be addressed in the design of health indicators is that of defining health and developing measures to assess the health status of populations.

In general terms, the main stages in the construction of socio-medical indicators of health status according to Chen and Bryant (1975) include:

1. Conceptualization of health
2. Dimensions to be included in health measures
3. Methodology in developing measures including the division and validation of measures .

In what follows each of these individual stages is discussed.

### 1.2. Definitions of health

A number of definitions of health have been proposed. Although it is assumed that health is a goal for everyone, differences exist when health is defined by individuals or by society. 'It is not easy to find a formula of health broad enough to encompass the requirements of a stevedore, a New York bus driver and a contemplative monk' (Dubos, 1960). A social definition of health includes concepts which have meaning for both society and for the individual. For an individual to be designated 'ill' or 'well' a consensus

between the individual and others who serve as status definers is required (Twaddle, 1974). This combination of professionally defined status and needs together with those determined by persons with health problems and who are said to be in need of services should provide a more complete assessment of health status and needs for care (Patrick, 1979; WHO, 1982). In an attempt to resolve this problem the need for measures of both social preferences for health status and consumer preferences for health care have been recognised (Walt and Vaughan, 1981). These indicators are not intended to replace traditional measures of population health but are supplementary to the latter, providing information about how people feel as opposed to how long they live and what maladies they suffer from. These indicators are of particular importance in understanding the impact of many of the chronic diseases, including among them dental illnesses. Therefore, the concept of functional ability and status followed by broader concepts of positive health, social health and quality of life have been proposed.

#### 1.2.1. The concept of functional ability

Functional status is based on the 'International Classification of Impairments Disabilities and Handicaps' provided by the World Health Organization - WHO (WHO, 1980). The WHO has provided definitions for the terms 'impairment, disability and handicap' and linked them together, conceptually, in the following schematic way:

Disease or disorder --> Impairment --> Disability --> Handicap  
Examples of this are:  
Blindness --> Vision ---> Seeing -----> Orientation  
Rheumatism --> Skeletal --> Walking -----> Mobility

In that classification, impairment is defined as 'loss or abnormality of psychological, physiological or anatomic structure or function' and disability as '... any restriction or lack (resulting from an impairment) of ability to perform an activity in the manner or within the range considered normal for a human being' and handicap as '... a disadvantage for a given individual, resulting from an impairment or a disability, that limits or prevents the fulfilment of a role that is normal (depending on age, sex and social and cultural factors) for that individual.' (WHO, 1980).

While impairment is concerned with biological function, disability is concerned with activities expected of the person or the body and functional handicap represents the social consequences of impairments or disabilities.

Functional status, besides relying upon the above definitions, is related to the ability to perform social roles, measuring the effects of disease rather than the disease itself. Functional status is just one component of health.

#### 1.2.2. The concept of positive health

The WHO (1958), in its 1946 constitution, defined health as 'a concept of complete physical, mental and social well-being and not merely the absence of disease and

infirmity'. Despite wide criticism for being too broad and abstract, three aspects of this definition in particular are important. Firstly, human beings are viewed as biological, psychological and sociological entities. Secondly, health is identified as a state which concerns the individual and must be described in terms of an individual's reactions (Elinson, 1979). Thirdly, the definition has generated a new focus on a broader, more positive concept of health, rather than a narrow, negative disease-based focus (Seedhouse 1986).

Presently, there is broad agreement that the concept of positive health involves more than the absence of disease or disability and implies 'completeness' and 'full functioning' or 'efficiency' of mind and body and social adjustment (Bowling, 1991). Beyond this there is no other broadly accepted definition. Positive health can be described as the ability to cope with stressful situations, the maintenance of a strong social-support system, integration in the community, high morale and life satisfaction, psychological well-being, and even levels of physical fitness as well as physical health (Lamb et al, 1988).

### 1.2.3. The concept of social health

Social health has been conceptualized as a broader view of health than simply reporting of symptoms, illness and functional ability (Donald et al, 1978). It has been viewed as a dimension of individual well-being distinct from both physical and mental health. Social health has also been

conceptualized as being a separate component of health status, in terms of the degree to which people function adequately as members of the community (Renne, 1974). Lerner (1973) noted that health status may be a function of non-health factors external to the individual, such as the environment, the community and significant social groups. Social support can thus be regarded as a key concept in theory and research on 'social health'.

#### 1.2.4. The concept of quality of life

Some authors extend the definition of health to include 'quality of life' (Andrews and Withey, 1974). Others regard health as only one of the various components of quality of life (Elinson, 1979). However defined, it is assumed that quality of life is a legitimate aim for public policy and resources (Gerson, 1976). Measures of quality of life have two features in common; structure and content. Firstly, they tend to reflect a multidimensional conceptual approach, which frequently involves four dimensions: physical health (eg. somatic sensations, disease symptoms), mental health ranging from a positive sense of well-being to non-pathological forms of psychological distress to diagnosable psychiatric disorder, social health including assessment of both quantitative and qualitative aspects of social contacts and interactions, and functional health including both, physical functioning in terms of self-care, mobility and physical activity level, as well as social role functioning in relation to family and

work. The objective is to provide a relatively broad coverage of relevant health dimensions. Secondly, they rely on the subjective judgement of the patients themselves, rather than on ratings provided by physicians, nurses, family members or other third parties (Aaronson 1988).

### 1.3. Measures of health

Recently, with the increasing focus on health promotion, research on indicators of positive health has intensified and has yet again been stimulated by the WHO (Abelin et al, 1986; Anderson et al, 1989). Progress has sometimes been slow due to differences of opinion between researchers and policy-makers on issues such as the definition and measurement of health. On the one hand, researchers tend increasingly towards self-ratings of present health, personal evaluation of physical condition, feelings of anxiety, feelings of general positive effect, and future expectations about health. On the other hand, policy makers may prefer more explicit indicators, such as limitations in activities of daily living, confinement to bed due to ill health and ratings of intensity, duration and frequency of pain, in the formulation of health policy (Noack and McQueen, 1988).

Relatively useful attempts in constructing subjective behavioral measures that were derived from interviews with lay people are the Index of Well-Being (Fanshel and Bush, 1970), the Sickness Impact Profile (Bergner et al, 1976) and the Nottingham Health Profile (Hunt and McEwen, 1980). Those

measures are justified by the fact that behavioral manifestations are quite easy to measure. These indices reject all illness not manifested behavioral, except for the Nottingham Health Profile that involves both behavioral and feeling states. The Index of Well-Being focuses on present level of functioning, independently of prognosis, where function is 'the ability to carry out one's normal activities'. It uses dimensions of social activity together with a symptom/problem complex to classify individuals into one of 43 levels of well-being. The major use of the Index of Well-Being is primarily as a measure of population health status to monitor changes over time. Another use of the index is in large scale evaluations of health programmes involving many people. The Sickness Impact Profile focuses on behavioral or performance dimensions on sickness related dysfunctions and contains 136 statements on health related dysfunction within twelve areas of activity. It was developed to provide a measure of perceived health status that is sensitive enough to detect changes or differences in health status that occur over time or between groups. It was designed to be broadly applicable, and intended to provide a measure of the effect or outcomes of health care that can be used for evaluation, programme planning and policy formulation. The Nottingham Health Profile is a two part instrument. The first measures perceived health problems while the second part assesses the extent to which such problems affect activities of everyday life. It measures perceived health problems in six fairly broad areas of functioning. It is sensitive enough to

be used with groups of disabled persons and instead of a single summary score being derived from the profile, six scores are obtained, one for each dimension measured.

Although a criterion for quality of life and its components can be specified for broader populations of healthy and ill persons, it can often be important to know how they vary in their importance for the different subgroups within these populations. For example, some subgroups may assign more importance to family roles than to work roles. The different weighting that people assign to particular roles should be reflected in the evaluation a researcher makes of the person's quality of life. Much variation in criteria may be dependent on the severity or the stage of the disease. A person without teeth will accept a lower capacity for chewing than people with more teeth. Perhaps old people will accept much more discomfort from their teeth than young people because of their body condition and adaptation to this condition. There is therefore a need to consider the importance that different subgroups of patients may assign to the components of quality of life.

The relationship between oral disease and quality of life has been investigated by a number of authors (Cushing et al, 1986; Strauss et al, 1988; Reisine, 1989; Locker, 1992). Although dental disease impacts significantly on many people's lives, measurement of its effects is difficult. For instance, work loss due to dental disease is not a sensitive indicator. It does not measure reduced productivity while at work (Reisine, 1984). On the other hand, despite the fact that the

measurement of masticatory inefficiency is a relatively simple procedure, it is possible to consume and digest an adequate diet without chewing (Ettinger, 1987). Additionally, it has not been possible to show the relationship between decreased ability to chew and the existence of gastric problems (Hunt, 1985). Conversely, it has been shown that people with an inadequate dentition claimed that the time spent eating a meal is a source of embarrassment to them, leading to social isolation and depression and certainly having an impact on their quality of life (Smith and Sheiham, 1979). Ettinger (1973) has identified a list of foods avoided by many edentulous subjects, noting that many of these foods have a high protein and vitamin level.

It can therefore be claimed that dentistry has focused on the wrong measures of social functioning and self-esteem to show that oral health improves the quality of an individual's life. Reisine (1981) in her review of socio-dental indicators reveals that research data available on the social impact of dental disease is limited and relates mainly to acute dental episodes which gives rise to the disruption of normal activities (Gerson, 1972; US Dept of Health, 1978; Sheiham and Croog, 1981). Of the non-acute dental conditions, only malocclusion and dental facial anomalies have received much attention regarding their social and psychological consequences (Schroeder, 1972; Rutzen, 1973; Shaw, 1982).

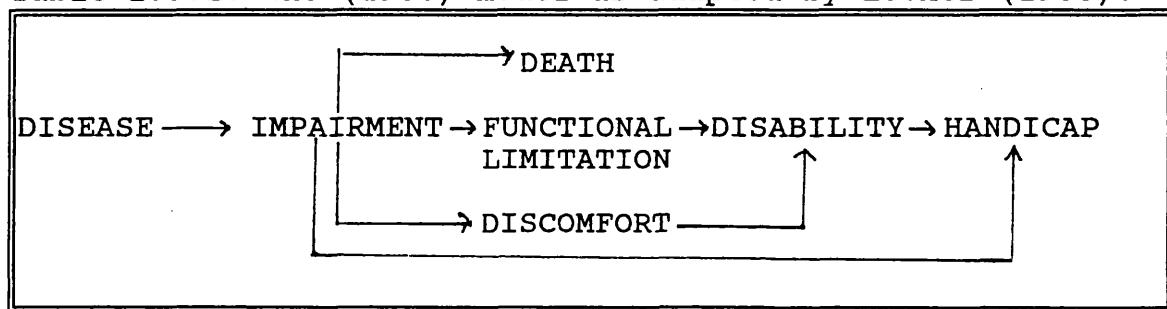
During the 1980s, the movement towards socio-medical indicators which blossomed in medicine in the 1970s, started in dentistry in relation to socio-dental indicators.

Traditional oral health measures have dealt primarily with decayed, missing and filled teeth, and periodontal health of populations from an epidemiologic perspective. However these measures alone do not fully explain an individual's need and demand for dental care, which are also defined by economic, social, and cultural factors. In order to incorporate those factors, several authors stressed the necessity of subjective measures of perceived needs and health status of consumers (Cohen and Jago, 1976; Sheiham and Croog, 1981; Nikias, 1985; Cushing et al, 1986; Locker, 1988; Reisine, 1989; Cushing, 1991).

In an attempt to give flesh to the rather abstract concept of health contained in its definition, the World Health Organization produced tentative suggestions with respect to acceptable levels of oral health. Those suggestions set goals to be achieved by European populations by the year 2000. These include, in addition to clinical goals for each age group, satisfactory prosthetic replacement for aesthetic reasons, freedom from pain, freedom from unacceptable deposits and intrinsic anomalies, and the possession of an occlusion which is functionally and cosmetically acceptable (WHO, 1982). While clinical data, which makes it possible to evaluate the fulfilment of these goals already exist for many countries, there is a lack of information on social parameters. To obtain such social information new oral measures based on oral health definitions are needed. With this motivation some definitions that attempt to strike a balance between the viewpoints of individuals and professionals have been proposed. In 1982, the

WHO provided the following definition: 'the retention throughout life of a functional, aesthetic, natural dentition of not less than 20 teeth and not requiring recourse to a prosthesis'. Later on the goal of 'freedom of pain' was included in that definition. Locker (1988) adapted the World Health Organization model of functional disability to be used as a dental model. This is shown schematically (Table 1.3.1).

Table 1.3.1. WHO (1980) model as adapted by Locker (1988).



Locker illustrated his dynamic model by referring to a study by Smith and Sheiham (1979) concerning oral health problems of the elderly. 'Because many of the elderly they interviewed were continuing to manage with poor and ill-fitting dentures, edentulism (impairment), largely the result of caries and periodontitis (disease), resulted in difficulties in chewing (functional limitation) which in turn restricted their ability to eat (disability). Many were unable to eat foods of their choice, and many found that it took much longer for them to complete their meal. This detracted from the pleasure of eating, caused embarrassment, and detracted them from eating with others (handicap). Many also reported social discomfort because of the poor appearance of their dentition and

difficulties with talking and singing' (Locker, 1989).

#### 1.4. Dimensions in oral health indices

Quality of life instruments tend to be characterized by a multidimensional structure which allows a broader coverage of relevant variables. For instance, oral conditions have their greatest psychosocial impacts on pain, impaired appearance, speech or taste and other elements related to quality of life (Reisine, 1985). In the last decade several studies highlighted those impacts.

Dental pain is common. Each person has, on average, three days of dental pain per year (Miller, 1975). Locker (1992) reported 37.2% people having one or more symptoms of pain. If denture-related pain was excluded the figure fell to 27.8%. Thirty two percent of the sample of elderly subjects in Smith and Sheiham's (1979) study had pain. In a telephone survey 13% of respondents reported temporomandibular joint pain (Locker and Slade, 1988). Although there is some evidence that pain appears to cause eating problems and a change in diet and disruption of daily activities (Locker and Grushka, 1987; Cushing, 1986) further research is needed to assess the severity of oral pain symptoms (Cushing, 1991).

The social significance of food and the enjoyment of being able to participate in a meal with a family and friends has led some authors to point out that eating problems may have an emotional impact (Smith and Sheiham, 1979; Epstein, 1987). Agerberg (1981) reported that chewing ability is

related to the number of teeth (more than seven teeth lost) and wearing of full dentures. In addition, Kayser (1981) suggested that a minimum of 24 teeth for younger people and 20 teeth for older people over 45 years of age is sufficient to maintain oral functioning without need of prosthesis.

Concern over the appearance of teeth has led some individuals to experience restriction in communication with others by way of talking, laughing, smiling and kissing (Cushing et al, 1986; Locker and Gushka, 1987; Strauss et al, 1988).

Although it may be argued that many important subjective impacts caused by oral status have already been identified, instruments used to collect data on those impacts remain quite limited. Some instruments cover limited areas of human activity, and others which have been expanded using some of the domains addressed by measures such as the Sickness Impact Profile (Bergner et al, 1981) require further development, testing and validation.

In terms of quality of life some instruments which cover a broader spectrum were proposed. In particular;

1. Testing existing measures of health and quality of life.

Reisine (1989) studied the impact of various dental conditions (TMJ dysfunction, advanced periodontal disease and poor denture status) using a number of quality of life measures, social functioning was measured using the Sickness Impact Profile (Bergner et al, 1976); well-being assessed using the Gill Well-Being Scale (Gill, 1984), Spielberg State/Trait Anxiety Scale (Spielberg, 1970), and the Corah Dental

Anxiety Scale (Corah, 1969); symptoms were measured by the Kiyak Oral Functioning Scale (Kiyak, 1984), the McGill Pain Questionnaire (Melzack, 1975) and the West Haven Multidimensional Pain Inventory (Kerns, 1985). The instruments used in this study were sensitive to differences amongst patient groups and hold promise for further development of quality of life indicators for use in epidemiological surveys and clinical dental trials. Another study as an example of using existing measures of health was done by Shaub (1984). Shaub applied the Sickness Impact Profile (Bergner et al, 1976) in measuring oral disease in young army conscripts in the Netherlands and showed negative results in almost all areas of behavioral functioning in the Index affected by problems of the mouth and teeth. As a result he concluded that a more sensitive and specific oral health instrument is needed.

## 2. Development of socio-dental indicators and measures specific to oral conditions.

Reisine (1985), based on Nikias' (1979) definition of socio-dental indicator as a 'measure of the extent to which oral conditions disrupt normal role function', used the data of a US National Health Survey to show that 4.9 million days of restricted activity, 6.7 million days of bed disability and 7.1 million days of work loss in 1981 resulted from dental conditions. Ettinger (1987) compared more recent data on dental conditions, pneumonia, acute eye, urinary and ear conditions, skin conditions and headache and found that oral conditions ranked fourth on number of days of disability in

that year.

Cushing et al (1986) developed indicators of the impact of dental disease as experienced by people in terms of pain, anxiety and dysfunction. The clinical indices of oral status they investigated were dental, periodontal and prosthetic status and treatment needs. Social and behavioral factors, including gender, age, social class and dental attendance patterns were also investigated. A questionnaire based on four categories; functional, social interaction, comfort and well-being and self-image (Table 1.4.1), was developed to measure the social and psychological impact of dental disease. A score for each individual was constructed from responses to questions related to these five categories. A total impact score was derived by adding together, for each individual, the scores obtained for each different category. Two total impact scores were used, one including and another excluding discomfort, in order to measure the difference between the inclusion or not of relatively common problems of discomfort. No attempt was made to measure severity within each impact category. It was assumed that the score for each individual provided at a crude level some measure of severity, since the higher the score the greater the number of impacts. The questionnaire was tested in a sample of 414 men and women aged 16 to 60 years from the North of England. One half of the dentate people involved presented food packing and/or sensitivity to cold, one quarter had toothache, one fifth had eating restrictions and one seventh had communication restriction and dissatisfaction with appearance of teeth.

Denture wearers had a higher impact on eating restrictions than the dentate subjects (one third of partially dentate individuals and half of the full denture wearers presented difficulties in eating). A difference between gender was found in terms of communication problems, women being twice as likely as men to experience communication problems. Increasing age was associated with more frequent eating and aesthetic problems. There was a difference in communication restriction by social class. Those who reported having eating problems had a higher DMFT and lower number of functioning teeth (number of sound and filled teeth) (Sheiham et al, 1987) than those with no problems. Dental pain and discomfort were associated with higher mean decay scores. Dissatisfaction with dental appearance was associated with one or more decayed tooth, almost two or more missing teeth and three fewer functioning teeth. Communication restriction was associated with decay status and functioning teeth. Those observations are summarized (Table 1.4.1).

Table 1.4.1. Social impact of dental disease categories (Cushing et al, 1986).

Impact category	
Functional	1. Eating
Social interaction	2. Communication
Comfort and wellbeing	3. (i) Pain (ii) Discomfort
Self-image	4. Aesthetics
Total impact	Score (0-4) Sum of categories eating, communication, pain and aesthetics
Total impact	Score (0-5) Sum of categories eating, communication, pain, discomfort and aesthetics

A score of 1 is given to the impact category if a positive response has been given to any of the items included in the category.

Cushing in her study developed a subjective measure with a score for each dimension and a total final score including all dimensions. To obtain a score for each dimension Cushing did not attempt to add items, she considered 0 for those who did not present any impact and 1 for those who presented 1 or more impacts. Therefore the severity within each impact category was not measured. In addition, no attempt was made to assess the different weights respondents attribute to the different items and dimensions involved. Therefore for practical purposes equal weights were implicitly assumed. Consequently, the measure did not detect the importance different sub-groups attribute to impacts in their daily living.

Strauss et al (1988) developed a 25 item 'Dental Impact Profile' (DIP) to measure dental effects on life quality and social function. The 'Dental Impact Profile' consists of 4 subscales, eating, health/well-being, social relations and romance (Table 1.4.2). The measure was tested on college students, private dental recall patients and old people at a day-centre. Responses were combined into positive and negative answers, excluding the 'no effect'. Gender, race and education were tested in the three samples and no significant influences were found. Age showed a significant effect on the health/wellbeing, romance and eating subscales. Impact on eating and health/wellbeing were lower in college students than on the other two groups. Romance had a lower impact on old people and no difference between groups was found on the social relation subscale (Table 1.4.2).

Table 1.4.2. The 'Dental Impact Profile' (Strauss et al, 1988).

Eating	<ul style="list-style-type: none"> <li>• Eating</li> <li>• Chewing and Biting</li> <li>• Enjoyment of eating</li> <li>• Food choice</li> <li>• Tasting</li> </ul>
Health/ Well-being	<ul style="list-style-type: none"> <li>• Feeling comfortable</li> <li>• Enjoyment of life</li> <li>• General happiness</li> <li>• General health</li> <li>• Appetite</li> <li>• Weight</li> <li>• Living a long life</li> </ul>
Social Relations people	<ul style="list-style-type: none"> <li>• Facial appearance to other</li> <li>• Facial appearance (to self)</li> <li>• Smiling and laughing</li> <li>• Moods</li> <li>• Speech</li> <li>• Breath</li> <li>• Confidence in the presence of others</li> <li>• Attendance at activities</li> <li>• Success at work</li> <li>• Social life</li> </ul>
Romance	<ul style="list-style-type: none"> <li>• Romantic relationships</li> <li>• Having sex appeal</li> <li>• Kissing</li> </ul>

Strauss et al (1988) did not have a final score either for dimensions or for the total instrument. In addition, the different importance respondents attributed to items and dimensions was not assessed. This subjective measure did not reflect the total impact respondents had in each dimension and did not detect the importance of those impacts in people's daily living.

Rosenberg et al (1988) developed the 'Dental Functional Status'. The 'Dental Function Status' covers lack of oral pain and discomfort and a person's ability to chew, speak and interact with people without being self-conscious about appearance. It involves four scales, psychosocial, mechanical,

role limitation and self-care each consisting of 25 items (Table 1.4.3). Clinical measures to be tested were obtained from the dental charts of each participant. Radiographs were evaluated for decayed, missing and filled teeth and for previously charted existing status of dentition and periodontal charting. In this study a general health subjective measure and a quality of life index were also used. The general health index ('Rand Medical Functional Status') gathered information on medical functional limitations (mobility limitation, restriction on role related activity, physical limitations and self-care). In addition, respondents were asked to rate their perceived general and oral health status. Forms of preventive health behaviour were investigated in terms of physical exercise (number of days per week), smoking habits (frequency and duration) and diet (the extent to which special diets were followed and whether they were recommended by a physician or followed under the respondents own discussion). The quality of life index consisted of 18 items about social support, physical health, role functioning, daily routine and general life enjoyment. A random sample of 159 dental clinic patients were interviewed. Forty-four percent of the variance in the 'Dental Functional Status' was explained by periodontal status, age and amount of exercise undertaken.

The clinical measures for decayed, missing and filled teeth were found not to be significant factors in defining a patient's dental functional status. The 'Dental Functional Status' was not significantly correlated with age, sex and

education ( $p<0.01$ ). Perceived dental health was significantly ( $p<0.05$ ) correlated with days of pain, dental and medical functional status but not with age.

Table 1.4.3. The 25-item 'Dental Functional Status' (Rosenberg et al, 1988).

Psychosocial	<ul style="list-style-type: none"><li>personal contacts, embarrassment and low self-esteem</li></ul>
Mechanical	<ul style="list-style-type: none"><li>limitations in chewing, speaking and opening wide and consuming different types of food because of pain</li></ul>
Role limitation	<ul style="list-style-type: none"><li>daily activities of work, housework or school</li></ul>
Self-care	<ul style="list-style-type: none"><li>ability to brush and floss</li></ul>

Rosenberg et al (1988) did not attempt to assess the importance respondents attributed to the different items and dimensions in her study. Therefore the different importance sub-groups give to impacts in their daily living could not be detected.

Gooch et al (1989) developed the 'Dental Health Index' consisting of three questions (Table 1.4.4) to explore the personal impact of dental problems in terms of pain, worry and conversation avoidance as much as factors associated with those impacts. 1,658 participants were questioned as part of the Rand Health Insurance Experiment (RHIE). In this study the relationship between oral health and social, mental, general and physical health was explored. Other variables examined were DMFT index, individuals components of DMFT index, Russell's Periodontal Index, age, sex, education, income and

marital status. Worry was the most frequently reported impact (41%) followed by pain from teeth or gums (29%) and conversation avoidance with others because of problems with teeth or gums (10%). The 'Dental Health Index' varied weakly but still significantly with race, education and income. Sex, age and marital status were not significant. Decayed, missing and filled teeth and the periodontal index showed a significant correlation with the subjective measure. The index was explained in less than 5% by sociodemographic variables and more than 10% by decayed, filled, missing teeth and periodontal status. The 'Dental Health Index' presented a significant association with mental, physical and general health. No significant association was found with social health index.

Table 1.4.4. The 'Dental Health Index' items (Gooch et al, 1989).

Pain	During the past three months, how much pain or distress have your teeth or gums caused you?
Worry	During the past three months, how much have your teeth or gums worried or concerned you?
Avoid conversations	During the past three months, how much pain or distress have your teeth or gums caused you?

Gooch et al (1989) developed a quite limited measure by working only with three questions. Further work is needed to select more items to compose the instrument so that a more reliable index score may be obtained. Furthermore, an individual score for each dimension should be reported prior

to generating a total score. In addition, no attempt was made to weight items and dimensions and consequently, the different importance sub-groups attributed to impacts could not be assessed.

Atchinson et al (1990) developed the 'Geriatric Oral Health Assessment Index' (GOHIA) designed to assess oral health problems of older adults (Table 1.4.5). The instrument consists of 12 items grouped in one single construct and did not contain subscales. It was administered to two independent samples. In a large-scale field test 1.755 people with a minimal age of 65 took part. Respondents who had a better education were white and the ones with higher incomes had a more positive impact. In addition, those who tended to have from 21 to 32 teeth, did not have a removable denture, and felt they did not need dental treatment presented more positive impacts. Objective clinical measures of oral health were significantly correlated ( $p<0.001$ ).

Table 1.4.5. The 'Geriatric Oral Health Assessment Index' (GOHIA) (Atchinson et al, 1990).

1. Eat without discomfort
2. Limit foods - dental problems
3. Trouble biting, chewing
4. Trouble speaking
5. Uncomfortable eating with people
6. Nervous/ self-conscious
7. Limit social contacts
8. Worry/ concern
9. Use medication for teeth
10. Teeth or gums sensitive
11. Pleased with looks
12. Swallow comfortably

Atchinson et al (1990) only offered one global score in their measure, leading to a loss of information and a difficult interpretability of the relationship between subjective impacts and clinical variables. Although this measure consisted of questions covering broader aspects of quality of life, all items were eventually grouped in only one dimension. A selection of items to be combined into more than one dimension should have been done. In addition, no assessment was made of the different importance respondents attribute to items and dimensions.

Chen (1991) using data from the New Zealand National Oral Health Survey, including adults of 35 to 44 and 65 to 74 years old and children of 12 to 13 years old, related biological measures of oral status to quality of life indicators. The quality of life measure consisted of three scales: symptoms, perceived well-being and level of functioning. An extra dimension was included for those who wore dentures (Table 1.4.6). A final score for each dimension was obtained by adding up items. The socio-demographic variables assessed were gender, age, education, occupation, income, general health and geographic region. Of those, the significant variables were age, general health and geographic region. Of the oral health status, number of decayed teeth was significant for all dimensions, number of missing teeth was significant for well-being and function and number of filled teeth were significant for well-being. She also related oral health behaviour (brushing, flossing, symptomatic visit and asymptomatic visit to the dentist) to the quality of life measure. Of those

variables, the symptomatic visit was significant for symptom and function and the asymptomatic visit was significant for well-being.

Table 1.4.6. Items included in the three scales of the quality of life measure (Chen, 1991).

1. Symptom	Number of symptoms
	0
	1
	2
	3
	4
	5-8
2. Well-being	Fair, poor or very poor Perceived oral health Dislike the way teeth/ dentures look
3. Function	Avoid laughing Avoid conversation Avoid meeting Others joke about teeth Unable to chew hard food Have limited activities due to pain Miss school due to pain Have trouble sleeping due to pain
4. Problems with dentures	Have problems when wearing dentures Talking clearly Eating Fit of dentures Soreness

Chen (1991) did not attempt to obtain a total final score or to weight items before adding them together in each scale. Therefore, the importance respondents attributed to individual items was not assessed and different subgroups within a population could not be detected.

Locker (1992) using data taken from the Ontario Study of Oral Health of Older Adults, conducted a longitudinal epidemiological survey of oral health and treatment needs of

907 adults aged 50 years and over from two metropolitan and non-metropolitan communities in Ontario, Canada. Based on his model (Table 1.3.1), data on impairment, functional limitation, pain and other symptoms and complaints, disability and handicap were collected using different scales for each category (Table 1.4.7).

Table 1.4.7. The Ontario Study of Oral Health of Older Adults: categories and measures used (Locker, 1992).

Impairment	clinical measure of oral health
Functional limitation	'Index of chewing capacity' (Leake, 1990)
Pain and other symptoms and complaints	<ul style="list-style-type: none"> <li>. a nine-item pain inventory</li> <li>. a thirteen item inventory (consisted of items derived from previous studies (Berkey et al, 1985))</li> </ul>
Disability and handicap	<ul style="list-style-type: none"> <li>. a seven-item scale of the social and psychological impact of oral disorders</li> <li>. a single item about the extent of worry or concern caused by oral health problems</li> <li>. a three item index of satisfaction with oral health</li> </ul>

The sociodemographic variables analyzed were gender, age, marital status, household income and educational status. The clinical variables considered were dental status (dentate/edentulous), number of missing teeth and number of natural functional units. In addition, the number of decayed coronal and root surfaces and the mean periodontal attachment loss (measured at two sites on each remaining tooth) were studied. Twenty four percent of the sample were edentulous.

Thirty percent of the sample reported limitations in chewing or biting (edentulous were found more likely to have chewing limitations than the dentate population). Thirty seven percent of the respondents reported one or more pain symptom while thirty-eight percent of respondents presented one or more impacts on social and psychological scales. Eighteen percent of the respondents were worried 'quite a bit' or a 'great deal' about appearance or health of their mouth.

The five sociodemographic variables studied were associated with subjective measures (Table 1.4.8). Clinical variables presented a weak but significant ( $p<0.001$ ) correlation with subjective measures except for pain symptoms. The number of missing teeth and mean periodontal attachment loss were significant predictors of impact scale scores.

Table 1.4.8. The Ontario Study of Oral Health of Older Adults: sociodemographic variables which were significantly associated with subjective measures (Locker, 1992).

SUBJECTIVE MEASURES	SOCIODEMOGRAPHIC VARIABLES
Psychosocial impacts	age, marital status, income and education
Worry about appearance or oral health	age and gender
Pain	gender, income and education
Other symptoms (eg: halitosis, dried mouth)	marital status and income
Chewing ability	age, gender, marital status, income and education
Dissatisfaction with some aspect of oral health	marital status, income and education

Locker (1992) used measures which were simple to administer, but his scale measuring social and psychological impacts was limited to only two areas of human activity. This scale might be expanded to cover areas such as emotional behaviour, work and leisure. In addition, no attempt was made to assess the importance that subgroups within a population attributed to different impacts in their daily living.

Slader and Spencer (1991) are developing the 'Oral Health Impact Profile', a scaled index of the social impact of oral disorders. This measurement is based on the theoretical model proposed by Locker (1988) (Table 1.3.1). It consists of 49 items grouped in seven subscales. The relative importance of statements within each subscale was assessed using Thurstone's method of paired comparisons.

This instrument was not assessed during the present study. The only relevant observation that can be raised is that the measure does not attribute weights to different dimensions and that no final score is obtained for the instrument. Therefore, the importance different sub-groups attribute to impacts could not be detected.

## 1.5. Discussion

Most the subjective dental measures described in the studies surveyed above cover broader and similar categories of quality of life. Cushing et al (1986) had functional, social interaction, comfort and self-image sub-scales. Strauss et al (1988) included self-image in social relations dimension and

had romance as a new category. Rosenberg et al (1988) included pain and functional status in a mechanical category, while self-care was included as a new dimension. Gooch et al (1989) found that three questions, attempted to cover pain, social relations and worry with mouth. Atchinson et al (1990), despite having questions covering function, social contacts and worry with mouth, after conducting factor analysis, ended up including all items into one single dimension. Finally, Locker (1992), considered dimensions such as disability and handicap, social interaction and self-image categories.

Items for the measures described, with the exception of the 'Oral Health Impact Profile' (Slader and Spencer, 1991), were grouped without being assigned weights. This is equivalent to implicitly attributing equal weighting to each of the items involved. A fundamental problem which arises from this is that some items may be more important to the construct underlying the scale than others and should therefore contribute more to the total score (Bowling, 1991). On the other hand, Streiner and Norman (1989) concluded that when the scale has more than 40 items or when items are fairly homogeneous, differential weighting contributes little, except complexity to the scoring. Further tests should therefore be conducted on those measures to verify if weighting is important or not.

All subjective measures described had items added up into total scores for each dimension, except for the 'Subjective Dental Health Index' (Gooch et al, 1989) and the 'Geriatric Oral Health Assessment Index' (Atchinson et al, 1990), which

grouped all items in one single total score. These last two measures were criticized, because they compound separate dimensions of human experience in one result, making this result difficult to interpret (Locker, 1992). Despite this criticism, it should be stressed that a total score is important since sometimes dimensions did not impact separately on people but simultaneously with a resulting combined impact. For instance, if people have an impact from pain and an impact from appearance at different time periods, this could have a different effect than from having an impact from pain and an impact from appearance occurring at the same time. One suggestion would therefore be to group together dimensions into a single total score, after considering their different weights. This would be preceded by adding items of each dimension into dimension scores. Each dimension would contribute to the single total score with the product of its own score by its weight. Having access to dimensions scores and a single total score would increase the flexibility offered by the measure in terms of aggregating and disaggregating the data.

Results from the subjective measures assessed by the indicators outlined above showed significant but weak, associations between sociodemographic and clinical variables in relation to subjective impact of oral status. These weak correlations can be explained, primarily, because the relationship between clinical variables and subjective measures are mediated by functional and experiential variables such as chewing and pain. In addition, these relationships are

further mediated by sociodemographic variables among others. Secondly, these weak associations can be expected given the nature of the measures employed. For instance, questions within one subscale may involve impacts which could be caused by different levels of clinical status. When those items are added together into one score, they mask this specific association with that of the clinical status.

Thus, there are theoretical and methodological grounds for suggesting that associations between clinical and social impact measures should be expected, but they are unlikely to be strong. This lack of a strong association means that definitions of need based on clinical and social criteria will differ considerably (Locker, 1992). Cushing et al (1986) suggest that those associations which are significant should be used to start building a picture of the characteristics, both clinical and social, of people who experience dental problems, and additionally to suggest the need for further research.

The indices reviewed reflect a more positive view of oral health and are assessing important dimensions of health which influence the daily life of individuals. Some requirements and a specific criteria which should be observed in developing subjective measures are discussed below.

#### 1.6. Methodology and validation in developing indicators

Any index of health status should conform to some well defined criteria. They should be simple, comprehensive and

able to isolate impacts which would vary with a real change in health or functional status. They should also be reproducible, able to identify target groups, of low cost to apply and reasonable to all those involved in health policy and research scientists (Culyer, 1976; Mushkin, 1979).

An index should cover in a clear manner the following aspects: Purpose, conceptual focus, operational approach, reliability, validity, sensitivity, utility weighting and quantitative manipulation (Jette, 1980; Ware et al, 1981).

#### 1.6.1. Purpose

Purpose, refers to the purpose for which the instrument is intended. For example, as Cushing (1991) points out, socio-dental indicators will provide information on the impact of oral diseases on the quality of life of individuals and the well-being of society. Expanding or modifying definitions of need by taking into account consumer views of need will provide a more comprehensive basis for monitoring individual and societal welfare and for evaluating oral health care services. Data obtained from these indicators form the basis for setting oral health goals, help health education planning, determining which cases and which conditions require treatment and which should be the priorities for the use of public funds (Cushing, 1991).

### 1.6.2. Conceptual focus

Conceptual focus involves two stages. The first stage is to determine the extent of coverage of the dimensions of health. Of the four broad dimensions frequently incorporated in quality of life instruments (physical health, mental health, social health and functional health) many measures incorporate variables that are specific to a given disease, treatment or research situation (Aaronson, 1988). Thus, for example, quality of life evaluations in dentistry will usually include self-image (Cushing et al, 1986), the Sickness Impact Profile included items related to physical, psychological and social roles dimensions (Bergner et al, 1976). The second stage is whether the instrument attempts to measure levels of well-being as well as discriminating at the illness/dysfunction end of the health spectrum. Relationships between the various components of health status and quality of life are difficult to assess. For example, the effect of activity restrictions on self-reported health or the relationship between disease progression and perceived quality of life (Patrick, 1982). The classification proposed by WHO (1980), of impairments, disabilities and handicaps, which moves from an individual to a behavioral and a social and cultural perspective, is a simple linear progression. It has been modified by Locker (1988) (Table 1.3.1) and described as a conceptual framework that has been used as basis for the development of some oral health measurements (Slader and Spencer, 1991).

#### 1.6.3. Operational approach

Operational approach, relates to how data are going to be collected. Dental data, for example, have been collected through telephone interview (Dillman, 1978), personal interview (Strauss, 1988) or questionnaires (Cushing, 1986). It can be collected in clinical settings or in the community.

#### 1.6.4. Reliability

Reliability is the ability of an instrument to minimise error in repeated measures. It can be tested in the following three ways: test-retest reliability, alternate forms analysis and internal consistency analysis.

Usually authors apply the internal consistency analysis, a technique that indicates the extent to which a scale is free of random error. Examples of internal consistency analysis are: split half reliability (where items in an instrument are divided into two equivalent parts and correlations between the scores on each part are computed); reproducibility (where the scale must be unidimensional and cumulative); and the Cronbach's coefficient alpha, (which indicates what the correlation would be between different versions of the same measurement, and therefore estimates what the repeatability of a test is likely to be (Guilford, 1954)).

Another way of testing the reliability of a measurement is the test-retest reliability. This is simply the correlation between the two scores of a same subject obtained

on two different occasions. A fundamental associated with the use of the test-retest reliability is that if the attribute is subject to considerable variation over the test-retest interval, then differences between test and retest scores may reflect 'true' changes rather than represent poor instrument reliability (Bowling, 1991).

The third test for checking reliability is the alternate forms reliability testing. Here each person is required to complete alternate forms of the instrument to be tested. The major problem associated with the test is ensuring that the two forms of the instrument are truly parallel (Bowling, 1991).

Ware et al (1981) suggest a number of 'rules of thumb' concerning reliability:

- 1- poorer reliability can be expected from short scales (few items for example),
- 2- reliability tends to be lower for disadvantaged persons (especially in respect of income and education),
- 3- higher reliability coefficients cost more than lower ones, since they require more information - items or observers or both - so a trade off between reliability and cost may be required.

#### 1.6.5. Validity

Validity, is probably the most important characteristic of any health status instrument. It refers to the extent to which an instrument measures what it is intended to measure. Three different criteria can be used to check the validity of an instrument: content validity, criterion validity and construct validity (American Psychological Association, 1974).

The first one, content validity, refers to the extent to which the items of an instrument cover a representative range of the construct to be measured. Some authors assume that one form of content validity is the 'face validity' (Bowling, 1991), others do not consider it a legitimate basis of validity (American Psychological Association, 1974; Kaplan et al., 1976). Face validity is, at the most basic level, a careful examination of the form of content of the questions of a measure (Aaronson, 1988). The second criterion to check the validity of an instrument is criterion validity. It involves comparing an instrument with an independent criterion that is a superior, more accurate measure of the construct to be measured (McDowell and Newell, 1987). Ideally, this independent criterion should be a 'gold standard'. Criteria validity is usually divided into two types: concurrent, a comparison of the proposed measurement with external criteria at essentially the same point in time; and predictive validity, when the instrument proposed attempts to predict a future state (Bowling, 1991). The third type of validity test, is the construct validity, that is concerned with the extent to which a particular measure relates to other measures consistent with theoretically derived hypotheses concerning the concepts that are being measured. It involves three steps. First, the theoretical relationship between the concepts themselves must be specified. Second, the empirical relationship between the measures of the concepts must be examined. Finally the empirical evidence must be interpreted in terms of how it clarifies the construct validity of the particular measure (Carmines and Zeller, 1978).

#### 1.6.6. Sensitivity

Sensitivity refers to the ability of an instrument to register changes when they occur. Unless the discriminative ability of an instrument is high, it will fail to detect important, but subtle changes. For example, Nottingham Health Profile, besides discriminating between groups of people having different health status, registers changes on people's health when they occur (Hunt and McEwen, 1985).

#### 1.6.7. Utility weighting

Utility weighting refers to how the items of an instrument are combined and weighted. Different types of scales (nominal, ordinal, interval and ratio) and different types of utility weighting methods (implicit utility weighting and explicit utility weighting) can be used here. Nominal (or category) scales are involved in classifying events or objects into mutually exclusive classes such as 'male' and 'female' or 'yes' or 'no'. The only information provided by a nominal scale is that the categories are different from each other and this information is clearly a very low level of 'measurement'. Rather than asking a person to simply agree or disagree with a statement some authors affirm that it is preferable to use an ordinal scale, asking respondents to indicate their opinion along a continuum spectrum (eg. Likert scale - Likert, 1952). However the amount of difference between these levels of agreement is not obtained. It can be concluded that one is

greater or smaller than the other. For the interval scale the size of differences between categories is defined. For example, the difference between 15 and 20 on the centigrade scale equals that between 85 and 90 on the same scale. However, because there is no true zero or point of origin, it is incorrect to say that 20. is twice as hot as 10 degrees (McDowell and Newell, 1987). Ratio scales are in this context one step ahead of interval scales, since they have in addition to the interval scale properties, a true zero or point of origin. There are two types of utility weighting methods. The first one is the implicit utility weighting, when authors implicitly decide on the rank ordering of items. The absence of any apparent utility weighting means that equal weights have been allocated to all items. Some authors question the validity of rank ordering or the equal weighting of items when apparently incommensurable aspects of health are combined into one dimension. They also criticize when some items that should be considered as more important than others contribute equally to the total score (Bowling, 1991). The main methods of weighting have been clearly and fully described by Streiner and Norman (1989). In practice, however, it is frequently found that weighting items makes little significant difference to subjects' relative score, because people who score high on one scale variant often score high on the others. Weighting items can increase the predictive ability of an index (Perloff and Persons 1988), but when the scale contains at least 40 items, or when the items are fairly homogeneous, then differential weighting contributes little (except complexity

in scoring) (Streiner and Norman 1989). The other type of utility weighting is the explicit utility weighting.

Researchers have been developing techniques to derive measures of explicit scaling methods to obtain weights for health status instruments. The most commonly used are traditional psychometric and econometric techniques, as the rating scale, the equivalence technique (Fanshel and Bush, 1970), the Von Neumann-Morgernstern standard gamble technique and the time trade-off (Torrance, 1972). One important criticism of these techniques is that disease sufferers probably assign more positive utilities to states of ill health than healthy subjects in hypothetical disease states. For instance, very elderly people may feel that a frail and painful existence is just as valuable to them as someone else's a healthier state. Some of those models are not adequately tested for validity and reliability , and they rarely ask sufferers themselves to suggest ratings. Judgements are usually made by experts. Another criticism is that it is difficult to quantify quality of life, which is a multidimensional concept, in terms of one figure (Bowling, 1991).

#### 1.6.8. Quantitative manipulation

Quantitative manipulation refers to the extent to which scores on the instrument are amenable to quantitative manipulation as a function of the level of the measurement of the instrument. The level of measurement required is dictated

by the proposed use of the instrument. eg: nominal/ frequency, mode, ordinal / median, percent, interval /mean, standard deviation (Rosser, 1979).

### 1.7. Hypothesis and aims

Some of the studies surveyed in this chapter did not have final overall scores. Others had too few items or did not cover all the main dimensions of quality of life. Finally some of these studies obtained scores for dimensions, but no total final scores with the exception of Cushing (1986) who had a score for each separate dimension and a total final score. None of them attempted to measure the importance respondents attribute to dimensions. The present study was based on Cushing's subjective measure, but differently from hers, it attempted to measure the severity of each impact category by adding items together in each category. In addition, the present measure attempted to assess how components of quality of life varied in their importance for different sub-groups within a population.

Based on the dimensions proposed in the 'Social Impact of Dental Disease' (Cushing et al, 1986) (functional, social interaction, comfort and well-being and self-image), a hypothesis to develop a measure of quality of mouth according to quality of life is developed in this research. This measure is conceptually based on the Nottingham Health Profile (Hunt et al, 1980) - a measure of behavioral and feeling status - and is related to the effects of oral condition on people's lives. This measure consists of scores for each dimension and, as a second step, a single final score. The single final score is generated by summing up weighted dimensions. The weights for dimensions are obtained from the sample considered through

the use of a separate scale.

The proposed measure has four sub-scales: appearance, performance, pain and comfort. Performance is the ability to carry out daily function, interact with people and eating restrictions; appearance consists of self-image; comfort is related to complaints of unpleasant status (bleeding gums, packing food); and pain.

The main objective of this research is to develop a sociodental method of assessing the quality of the mouth. The measure will include social and psychological dimensions as well as clinical measures.

The measure is constructed from the score of :

- Importance that people assign to appearance, comfort, pain and performance
- How much appearance, comfort, pain and performance affect their daily living

The clinical examination consisted of the DMFT (Klein, 1938), periodontal and prosthetic status.

The assumption, based on the literature reviewed, is that oral status has an impact on people's quality of life. The general hypothesis is that the new measure will assess the degree of the psychosocial impact of the mouth in terms of appearance, performance, comfort and pain.

same list  
in different order  
150

## CHAPTER 2

### METHODOLOGY

#### 2.1. Introduction

The purpose of this study is to develop and test a sociodental indicator which combines measures of quality of life impacts and assessment of clinical oral status. A questionnaire consisting of four different dimensions and a scale to assess the ranking of impacts were developed to assess the indicator. Clinical oral health status was assessed so that composite socio-dental measures could be related to ranges of clinical status. The method was tested in Brazil on a sample of 662 people, aged 35 to 44 years old, of two social classes, both genders and with three different levels of dental caries status: low, medium and high DMFT or with a full upper denture. The research instrument was developed and tested in open ended interviews and a pre-pilot study.

#### 2.2. Development of research instrument - social data

The development of the main questionnaire initially involved some open-ended interviews with a group of Portuguese people living in London, since the indicator was going to be tested in Brazil. Informal interviews with groups and individuals based on dental health topics and oral health impacts on people's lives were held at Community Centres.

The topics raised by people during the interviews, in addition to relevant material from other dental and general health studies and questionnaires, were used to construct the main questionnaire and a scale. The scale consisted of the four major categories that questions were based on. Therefore it purports to measure the importance of the corresponding categories.

The instruments were subsequently tested on Brazilian students living in London. These interviews were conducted prior to the pilot study. This exercise was used to test phrasing and sequence of questions, to assess the duration of the interviews and to probe further areas of enquiry. The questionnaires were modified following each group of interviews.

The interviews resulting from this pre-test took 20 to 40 minutes and covered all the main variables which were considered relevant to quality of life related to oral status.

The scale was tested before each interview and understanding and comparison between categories was checked. It was modified following each group of interviews according to feedback.

#### 2.2.1. Questionnaire

The basic questionnaire consisted of 49 questions covering four main categories: dental appearance, mouth comfort, oral pain and general oral performance. Extra questions were added to the instrument for those who wore

partial or full prosthesis or both. These questionnaires consisted of 56, 62 and 67 questions respectively.

Items selected and adapted from other questionnaires: 'The Social Impact of Dental Disease' (Cushing, 1986), 'General Health Rating Index' (Ware, 1976), 'Dental Esthetics Satisfaction in Adults' (Neumann, 1989), 'Adult survey - Adult Dental Health' (Todd and Lader, 1988), 'Nottingham Health Profile' (Hunt, 1986), 'Social and Psychological Factors in Dental Health in Israel' (Shuval, 1971), 'Dental Conditions and the Quality of Life' (Reisine, 1986) and 'Subjective Well-being Questionnaire' (Gill, 1984) (Appendix 1 and 2).

#### 2.2.2. Scale

Previous measures of oral impacts have not given relative weights to the different dimensions. So a scale was developed to find a proportional relationship between the four dimensions considered, the basic idea being that weights were attributed by each person, for each of the dimensions. The weights were proportional to the relative importance of each dimension in relation to the other dimensions. Four identical scales (one for each dimension) having sliding arrows attached to them were constructed (Appendix 3). The arrows were to be placed at a position that reflected the importance attributed by the person to the dimension for each scale. Individuals were allowed to modify arrow positions on the scales so that the final position would reflect the importance of a particular dimension, in relation to the other three. Scales

ranged from 0 to 10 and the values attributed to each dimension were summed up for each person. The weight of an individual dimension, was equal to the value they attributed to that particular dimension divided by the sum of the values attributed to all dimensions. The effect of standardizing weights in this way is that the total sum of weights for each respondent will always be 1. This can be interpreted as attributing the same total importance for the four dimensions to all respondents. For example, respondent A attributes a value of 10 to appearance and pain and a value of 8 to comfort and general performance, respondent B attributes a value of 5 to appearance, of 10 to pain and comfort and a value of 8 to performance. The total attributed value by respondent A ( $10+10+8+8$ ) is 36 and by respondent B ( $5+10+10+8$ ) is 33 points. The weight considered for each category is: value attributed to dimension/total attributed value for the scale. Therefore, weight for appearance by respondent A would be:  $10/36=.28$ , for pain:  $10/36=.28$ , for comfort  $8/36=.22$  and for performance:  $8/36=.22$ . The weight for respondent B for appearance would be:  $5/33=.15$ , for pain:  $10/33=.30$ , for comfort:  $10/33=.30$  and for performance:  $8/33=.24$ . Total weight for scales is the sum of the weights for the four dimensions. In this way, total weight for scale A is:  $.28+.28+.22+.22=1$ , total weight for scale B is:  $.15+.30+.30+.24=.99$ . The total of all the scales has the total weight of 1, the implicit assumption being that no distinction should be made between individuals. Weights are used together with the results of the dimensions to obtain a final score for the questionnaire.

### 2.2.3. Final score

To construct a final score, questions within each category are summed and divided by the number of items, giving a score for each dimension. Before adding the different dimensions, they receive the respective weight attributed in the scale, otherwise it would be assumed that each was equally important. Then the four categories are finally added to give a final score. For example:

$$[(\text{sum of scores of questions about appearance}/ n. \text{ of questions of appearance}) \times \text{weight attributed to appearance}] + [(\text{sum of scores of questions about pain}/ n. \text{ of questions of pain}) \times \text{weight attributed to pain}] + [(\text{sum of scores of questions about comfort}/ n. \text{ of questions of comfort}) \times \text{weight attributed to comfort}] + [(\text{sum of scores of questions about performance}/ n. \text{ of questions of performance}) \times \text{weight attributed to performance}] = \text{total score.}$$

The questionnaire purports to provide information about the impact that the oral status has on people's quality of life. It covers the following dimensions: appearance, comfort, pain and general performance, dealing equally with negative or positive impacts in the above categories. Data were collected through interview and clinical examination by the researcher. Subjects were examined and interviewed at their place of work.

### 2.3. Data analyses

After collecting the data from interviews and doing the clinical examination, data were coded and entered into a computer. Analysis was carried out using the Statistical

Package for Social Sciences (SPSS/PC+ - version 4, 1990) programme. Data analysis was in two stages: testing the instrument and analyzing the data collected. To test the instrument, reliability tests, Spearman correlation, the Kruskall-Wallis one-way anova test, Wilcoxon test and factor analysis were used (Chapter 7, 'Testing the instrument').

To analyse the data collected, descriptive analysis, Spearman correlation and the Kruskall-Wallis one-way anova test were used (Chapter 8, 'Results').

Fourteen different population groups were selected according to their oral status, high or low socio-economic class and of both sexes. Oral status was divided in three different groups: low, medium and high DMFT. Additionally, a group of people who wore a full upper denture was included. This group was low social class of both sexes.

After the internal analysis, three different groups; those who had a positive impact, those who had a relatively positive impact and those who had a negative impact caused by their oral status on their daily living, were created. The three groups were formed by summing up items in each dimension and dividing it by the number of questions, weighting each dimension and then adding up the final score.

The dimension scores were obtained as follows: Each question had five or options with a yes or no alternative. The five options were: very satisfied, satisfied, more or less, unsatisfied, very unsatisfied or similar answers. The options were coded as positive (+1), neutral(0) and negative (-1) scores. If questions were added without

applying any weight, it would implicitly be considered that they had the same weight. To weight items, a complementary study was conducted (Chapter 5, 'Complementary study'). From that study it was concluded that weighting or not weighting questions did not make a difference. Therefore, questions were summed up as +1, 0 or -1. To add up the questions, those within each dimension were aggregated as a total number of points and divided by the number of items, resulting in a dimension score (eg. appearance dimension has 4 questions- total score: 4 questions summed/ 4). Because they were divided by the number of items in the category, total scores varied from +1 to -1. Therefore, four dimension scores were obtained: appearance, comfort, general performance and pain.

Extra questions were asked of those who wore partial or full dentures. In that case, summing up scores was conducted separately for each group and then divided by the respective number of questions; those who did not wear a prosthesis (n=465), those who wore a partial prosthesis (n=106), those who wore a partial and a total prosthesis (n=20) and those who wore a total prosthesis (n=71).

Within each of those groups, three groups were formed: satisfied, relatively satisfied and unsatisfied. Those who were selected as 'satisfied' were those who had scores of .70 or above, those relatively satisfied, were those who had scores from 0.69 to above 0.0 and the unsatisfied were those who had scores of zero or below. Finally, groups were aggregated as the total number of satisfied, relatively satisfied and unsatisfied respondents for each dimension

15  
short form

(Appendix 14).

### 2.3.1. Weighting the dimensions

After obtaining final dimension scores, each dimension was weighted. These weights were obtained from the scale, as explained earlier. Each dimension final score was weighted with the score which was attributed by respondents on the scale and divided by the sum of these scores (Appendix 10). After that, dimensions were summed up to give a total final score.

### 2.3.2. Final questionnaire score

To calculate the total score, final dimension scores after weighting were totalled. The final score consisted of three groups according to satisfaction. Those from zero or below were classified as unsatisfied, those from 0.01 to 0.69 as relatively satisfied and those from 0.7 to 1 as satisfied.

### 2.3.3. Statistical tests

In total there were 14 different groups according to their oral status, social class and sex (Chapter 8, 'Results'). In addition, three groups of satisfied, relatively satisfied and unsatisfied in the dimensions score and total score of the instrument were formed.

The mean index scores were calculated for the number of

decayed, missing, filled teeth and DMFT in each of the three categories of satisfaction. Also, mean scores of number of teeth with calculus and teeth which had bleeding gum, gingival recession, periodontal pockets and mobility were calculated for each group of satisfaction. For those who wore a prosthesis, appearance, retention, stability, defects and hygiene of prosthesis were analyzed and the number of people in each category of satisfaction presented. Mucosal changes were recorded.

Differences by sex and social class in the questionnaire scores and oral status were examined using the Kruskall-Wallis test one-way anova.

Spearman correlation coefficients were used to examine the association between clinical and subjective measures.

## CHAPTER 3

### PILOT STUDY

#### 3.1. Description

Before conducting the main study, the pilot study was carried out to test the feasibility of the methods used (interview and clinical examination).

The sample consisted of patients attending private dentists and doctors and others from the Underground Transport Company in Rio de Janeiro. People were given a brief explanation of the research. Confidentiality was emphasised. Information about their socio-economic status was obtained through questions on socio-economic indicators (Aba-Abipeme, 1978) (Appendix 5). Then they had a clinical examination and subsequently they were interviewed. The criteria used for clinical examination was adapted from WHO (1987), Cushing (1986), Greene and Vermillion (1964) (Appendix 4). People were approached again on their subsequent appointments to the dentist or doctor to have another clinical examination and interview, to test intra-examiner reproducibility.

Interviews were conducted by the researcher. Respondents were asked to explain what they understood by each question. Understanding, phrasing and sequence of questions were checked. After the first 10 people, minor modifications were made to the questionnaire and the scale. During the other 49 interviews understanding had improved.

Optimum procedures had been established for field work control and organization. Clinical examinations had been tape-recorded and afterwards transcribed onto a form (Appendix 4). People expressed interest in the scale and the questionnaire.

Hence it was possible to simulate conditions that would apply to the examinations and interviews in the main study. Each dental examination took 10 minutes. After being re-examined, people were re-interviewed, for examiner reproducibility.

### 3.2. Response rate

Of the 69 individuals invited, 59 (88%) accepted and 10 (12%) declined to participate. Of these 59 subjects, 16 women and 14 men were lower social class and 15 women and 14 men higher social class. After the first 10 interviews, some changes were made to the questionnaire. Changes were checked on the next 49 (73%) interviews (Appendix 7).

### 3.3. Discussion

On the whole, the research design proved to be satisfactory. However, some adjustments had to be made. These improvements will be discussed.

#### 3.3.1. Clinical examination

It was decided not to use a dental chair so as to afford

the researcher greater freedom to go to places where there were no dental surgeries.

The clinical examination did not need any modification, since the clinical criteria, adapted from WHO (1987), Greene and Vermillion (1964), Cushing (1986), proved to be applicable to the purpose of the research.

A detailed description of the clinical examination is presented in Appendix 4.

### 3.3.2. Questionnaire and scale

The manner of presenting the scale needed some modifications. In the questionnaire some words were changed to improve understanding and some questions were re-ordered. After these improvements the next 49 interviews were successful.

### 3.3.3. Response rate

In the majority of the cases, non-response was because people had no time.

## CHAPTER 4

### MAIN STUDY

#### 4.1. Main study population

Because the objective of the study was to develop and test an instrument, a representative sample of the population was not needed. A convenience sample involving both sexes, with a specific age range, oral status and social condition were selected. Each of them will be discussed in detail, in the following sections.

##### 4.1.1. Age

Because this variable is strongly related to oral health (Todd and Walker, 1980), a specific age group was selected. People aged from 35 to 44 years of both sexes were invited to take part. This age range was chosen because most adults have experienced dental disease and felt the impact of their oral status on their lives. According to WHO (1987), this is the standard monitoring group for the health condition of adults. The full effect of dental caries, the level of periodontal disease, and general effects of care provided can be investigated from data relating to this age group (WHO, 1987).

#### 4.1.2. Oral status

Individuals were grouped according to their oral status into low, medium and high DMFT or edentulous groups.

##### 4.1.2.1. DMFT group

No reference was found as to what might constitute high, medium or low DMFT in adults. The WHO (1982), in a tentative proposal of acceptable levels of health by age, suggested that for 35 to 44 year olds a DMFT of 7 was acceptable. This could have been considered a medium DMFT for the study's sample. But, since it was not possible to find enough people with this medium oral status it was not used in the study, as the DMFT levels were higher. Therefore, it was decided arbitrarily that the high DMFT group, ranged from 28 to 21 teeth, the medium DMFT group from 20 to 13 teeth and the low DMFT group from 12 to 0 teeth.

##### 4.1.2.2. The edentulous group

At first, four different groups of edentulous people were considered: female of lower social class, male of lower social class, female of higher social class and male of higher social class. Because there was a small number of people who fitted those attributes, groups were reduced to lower social class of both genders wearing upper denture with some lower teeth. Even after applying those criteria to the higher social class

it was difficult to find suitable participants.

#### 4.1.3. Social class

Subjects were divided into two groups; higher and lower social class based on ABA-ABIPEME social class criteria (1978) (Appendix 5). That is composed of five different social classes: A, B, C, D and E. Classes were determined by 7 economic indicators and level of education of the head of the family. Those with the highest socio-economic status were coded as class A followed by classes B, C, D and E which were those with the lowest socio-economic status. In this study higher social class included, according to ABA-ABIPEME, people classified as classes A and B. The lower social class included people classified as groups C and D. Class E of the ABA-ABIPEME classification was not included, since they are not an easy group to contact. They are mainly composed of homeless people and usually have temporary work.

#### 4.1.4. Sample representativeness

To test the hypothesis that oral status has an impact on people's quality of life, groups having different oral status, gender and social class had their questionnaire scores analysed. Fourteen groups composed of at least 39 people in each were contacted. Because the minimum acceptable number of units per cell for an adequate statistical analysis is 30 units in each cell (Bland, 1987), the group sizes to test the

hypothesis were statistically adequate.

The objective of the study was to develop a measurement and to look for the relationships between variables. The sample is not representative, any findings cannot be extrapolated to cover the general population. Any use of the measure on other population groups would need prior validation.

#### 4.2. Methods of sample selection

As the study aims to develop an indicator, no attempt was made to choose a representative sample. Because specific groups were being looked for, several different places had to be visited to gather sufficient numbers to fill the fourteen cells. These places included universities, companies and a church: Rio de Janeiro Underground Company, National Bank for Economic and Social Development (BNDES), National Laboratory for Scientific Computing (LNCC), Social Service for the Industrial Confederation (SESI), Brazilian North East Bank (BNe), Rio de Janeiro Water Authority (CEDAE), Social Security Service for the Power Generating Company (ELETROS), SENDAS Supermarkets, Catholic University of Rio de Janeiro (PUC), Church of the Universal Kingdom (illiterate people on training programmes), Rocinha (shanty town), Joao Fortes Engenharia - building contractors, Shopping Centre and Apart Hotel (Rio Sul and Rio Flat - cleaning people), Clothing Industry (Sayonara), Presidente-Building contractors, Clothing Industry (Company) and Brazilian National Oil Company (Petrobras)

(Appendix 6).

When dealing with larger companies, permission from their medical departments had to be obtained. Subsequently, departmental heads were contacted and asked for permission to approach their staff. Whenever the contact was successful, a departmental head would select people of the appropriate age and invite them to take part in the study. Sometimes the invitation was made by the researcher.

The study was carried out in a specially allocated room or in refectories, classrooms or workrooms. Some interviews were carried out in the presence of others but mostly they were carried out in private. Clinical examination and interviews were conducted during working hours.

#### 4.3. Response rate

Of 771 individuals invited to take part in the main study, 698 agreed to have the interview and clinical examination, representing a 90.5% response rate. Of these 698 individuals, 36 persons were excluded. The reason was that 15 people had been contacted in a situation where bias might have been incurred. These included people visiting medical services and people requesting medical certificates. In addition, 21 people were totally edentulous.

Therefore the main study included 662 individuals; 85.68% of the whole population (771 people) (Appendix 7).

#### 4.4. Data collection

The data collected were of three types: clinical, socio-economic and social. The following three sections will describe the process of data collection.

##### 4.4.1. Socio-economic data

Socio-economic data were obtained through an interview. Confidentiality was emphasised and necessary explanations about how to answer the questions were given.

Identification and questions about socio-economic status were asked. These were questions on age, marital status, profession, place of birth and socio-economic indicators (Appendix 5).

##### 4.4.2. Clinical data

The oral examination included an assessment of dental caries (DMFT), periodontal status, tooth mobility, enamel disorders, malocclusion, TMJ dysfunction and prosthetic status. The criteria used were those laid down by the WHO (1987), Cushing (1986) and Greene and Vermillion (1964) (Appendix 4).

Clinical examinations were tape-recorded and later transcribed onto a special form (Appendix 4). Each examination took an average 10 minutes.

Consistency of the exam was assessed throughout the

field-work. Every sixth person, after a group of fifty, was re-examined. Eighty-four of the 698 people were re-examined (Appendix 8).

#### 4.4.3. Social data

Data were collected by interview using a scale and a structured questionnaire (Appendix 1 and 2). The reason for using this method of interview was to include illiterate people. Interviews were preceded by explanations.

First, people's opinion on appearance, symptom, comfort and performance was measured on a scale ranging from zero to ten. People were asked to mark on each scale the value they attributed to the associated category by moving a sliding arrow. They were allowed to change the position of the arrows along the scales, so that they could not only set a value on each category in absolute terms, but also in relation to one another. Then, they were asked the questions on the questionnaire. Questions were asked and options for answers given. There was the basic questionnaire, which consisted of 49 questions. For those who wore a partial, total or partial and total prosthesis, extra questions were added to the basic instrument, resulting in 56, 62 and 67 questions respectively. Questions asked measured the impact that the mouth had on people's quality of life.

Interviews took on average 10 to 20 minutes. Lower social-class people took more time than the higher social class.

Consistency of the interview was assessed at the same time as the assessment of clinical examination consistency. Each sixth person after a group of fifty were re-interviewed. Eighty-four out of the 662 people were re-interviewed. Test-retest reliability was conducted on these data (Chapter 7 'Testing the instrument').

## CHAPTER 5

### COMPLEMENTARY STUDY

#### 5.1. Objective

The complementary study was conducted  after the main study. There were two objectives:

- . to assess the weighting of each question used in the measure to calculate a final score for each dimension (Chapter 6 'Dimension scores and total score'),
- . to establish the validity of the scale used in the main study (Chapter 7 'Testing the Instrument').

#### 5.2. Methods

Because the researcher had returned from Brazil after the main study, this complementary investigation was done in London. It was conducted from May to October 1991 with Brazilian students living in London. Two stages were involved. The pilot study, where respondents were interviewed to test the instrument used, and the main study. The instrument was mailed to respondents. A postal questionnaire was chosen because of limited financial resources.

The following section will explain the development of the instrument used.

### 5.2.1. Scale

The scale was patterned on the 'Social Readjustment Rating Scale' (SRRS) developed by Holmes and Rahe (1967), in which they assign values for different life events. The subject is given an arbitrarily selected modulus item (eg.marriage) which is given an arbitrary value of 500, and a list of other items to be rated (43 life events). The subject is asked to compare each item on the list with the modulus item, decide whether it is likely to require more or less social readjustment, is less or more serious, than the modulus, and assign it a proportional value accordingly. Mean weights for the group's ratings are calculated.

The instrument used in this complementary study had three parts. The first consisted of 36 topics selected after the analysis of the questionnaire (Chapter 7 'Testing the Instrument'). These items were grouped in 4 scales. Each scale corresponded to the respective dimension to which they related. For each dimension, a modulus item was arbitrarily selected and received a value of 500. The other items were listed below and subjects were asked to rank them according to whether they were better, equal or worse than the modulus item. The second part of the instrument consisted of ranking the dimensions. The weighting of the five dimensions (appearance, comfort, performance, pain and eating restriction - the last one was a new dimension considered after conducting factor analysis) (Chapter 7 'Testing the Instrument') was organised in the same way as items were compared in the first

part. One dimension was arbitrarily chosen to be the modulus item and received a value of 500. The other four dimensions were listed below and subjects were asked to rank them according to whether they were better, equal or worse than the modulus dimension. The third part of the instrument involved a list of the same 36 items used in the first part, although this time they were not grouped into 4 scales but into a single one. An arbitrary modulus item was chosen among the 36 topics and received a value of 500. The other 35 items were listed below and respondents were asked to rank them in the same way as was done before. At the end of these three parts some questions were asked about respondent's oral status. In the case of any of them wearing a denture, she/he was excluded (Appendix 9).

The first part of this instrument was used to obtain the weighting for each question used in the questionnaire of the main study. This weighting is necessary because the main study involves summing item scores, and if weighting for questions were not applied, it would implicitly be assumed that items had equal weights. Results for this part of the study are discussed in Chapter 6 'Dimension scores and total score'.

The second and third parts of the instrument were used to test the validity of the scale used in the main study. This scale asked respondents to weight dimensions. Those weighting were then attributed to dimension scores which were obtained from the questionnaire. The validation test investigated if dimension weights obtained in the second part of the complementary study (which has a similar scale to that used in

the main study) corresponded to the importance respondents attributed to the 36 items in the third part of the instrument. Results of this investigation are described on Chapter 7 'Testing the Instrument'.

### 5.3. Pilot study

Of the 31 Brazilian students invited to take part in the pilot study, 28 accepted. They were interviewed and understanding of questions and questionnaire structure was tested. Some changes were necessary in some of the wording on oral status.

### 5.4. Main study

The questionnaire was posted to 60 Brazilian students whose names were drawn from a list of members of the Brazilian students' association in Britain. The age of this population ranged from 32 to 42 and was composed of 29 females and 31 males. People of the same nationality as those in the principal study were chosen because the values given from respondents to items, would not then suffer cross-cultural and intra-cultural variation.

#### 5.4.1. Reliability

Internal consistency of the questionnaire was tested.

Cronbach's coefficient alpha test showed a high reliability (Cronbach's alpha = .88).

### 5.5. Response rate of the complementary study

In the pilot study, of 31 (100%) people contacted, 28 (92%) participated. The 3 (8%) non-accepters said they were too busy.

In the main study, of the 60 invited to take part in the research, 44 (73%) returned their questionnaire on time to be included. Of the other 16 (27%), 7(12%) did not answer, 4 (7%) responded too late and 5 (8%) were undelivered (Appendix 7). Of these 44 questionnaires included, 7 did not have answers for all the items in the third part. As a result, since the third part of the questionnaire was used to validate the scale, only 37 questionnaires could be used in this experiment.

### 5.6. Discussion

Although the sample population used in this study was not the same as in the main study and did not involve people of lower social class, the participants were lay people of the same nationality as those in the main study. None of them were health professionals or students. This complementary study gathered information to analyse and discuss the measure used in the main study (to establish the validity of the scale used and the weighting of items included in the questionnaire). The

complementary study results are not to be used in drawing any information or conclusion about the population studied.

Data obtained in this study to establish the validity of the scale used in the main study will be analysed in Chapter 7 'Testing the instrument'. Two parts of the questionnaire used in the Complementary study (the second and the third parts) will be used in this analysis. Weights obtained for dimensions in the second part of the instrument will be compared to weights calculated for dimensions from data in the third part of the instrument.

The data obtained in this study to analyse the weighting of the items included in the questionnaire will be used to weight questions before adding them into dimension scores in the main study. Those results are to be compared with dimension scores calculated when items had no weights attributed. This will be discussed in the next Chapter 'Dimension scores and total score'.

## CHAPTER 6

### DIMENSION SCORES AND A TOTAL SCORE

#### 6.1. Introduction

Some authors claim that before adding items together a weight should be attributed to each item, otherwise it is being implicitly assumed that items have equal weights (Perloff and Persons, 1988). Others claim that weighting contributes little to the final score (Streiner and Norman, 1991). To test this issue, items included in the main study questionnaire were weighted in three different ways, before being added together into dimensions scores. The first choice was to attribute weights obtained from the complementary study (Chapter 5 'Complementary study'), the second one was to attribute weights obtained from factor analysis (Chapter 7 'Testing the instrument') and finally, the third choice was not to attribute weights to all (thus implicitly attributing equal weights to items). After weights were attributed, items were added together into dimension scores, and the three resulting versions of dimension scores were compared. The following sections explain this process in more detail.

#### 6.2. Weighting and scoring items

In the main study, items were summed into a final score

for each dimension. Scores for answers such as 'very satisfied' or 'satisfied' were '+1'. Answers 'more or less' were given '0' and 'unsatisfied' or 'very unsatisfied' were given '-1'. When answers were yes or no they were scored as '+1' or '-1' according to whether the impact was positive or not (Appendix 10).

Some authors advise weighting items before summing them (Perloff and Persons, 1988), others claim that if items are homogeneous or the measure consists of more than 40 items, weight contributes little, except for complexity in scoring (Streiner and Norman, 1991). Lei and Skinner (1980) using the Holmes and Rahe (1967) 'Social Readjustment Rating Scale' (SRRS), compared four versions of the SRRS to test if weights contributed to a final score. The first version used the original weights assigned by Holmes and Rahe, the second was simply a count of the number of items endorsed, the third used 'perturbed' weights, where they were randomly shuffled from one item to another, and the fourth used randomly assigned weights. They found that the correlations among these four versions was 0.97. In other words, it did not matter whether original weights, random weights, or no weights were used; people who scored high or low on one variant scored high or low on all the others.

An investigation to assess the importance of weighting or not weighting items in this measure was conducted. Three different versions of the measure were compared. The first version used the data obtained from the complementary study, where Brazilian students attributed a weight to each item

(Chapter 5 'Complementary Study'). A mean score from each rank was obtained and this weight was applied to each question. The second used 'factor loadings' obtained from factor analysis (Norusis, 1990) (Chapter 7 'Testing the instrument'). These loadings were assigned as question weights. Finally the third was not to weight items. This version implicitly assumed that items had equal weights. All questions within each dimension were summed (after being multiplied by their respective weights) and then a final score for each dimension was obtained. Final scores for equal dimensions were found to be highly correlated ( $p<0.001$ ) when the three versions were compared (Appendix 10). These results were similar to those obtained by Lei and Skinner (1980). Namely, it did not matter whether weights were used or not. Most respondents who would score high in one version of the experiment would also score high for the other versions. The same situation obtained for those scoring low.

The study outlined above was followed by a more detailed investigation. Respondents were grouped according to their questionnaire scores as unsatisfied (those who had scores below 0) and satisfied (those who had scores of 0 or above 0) for each dimension. Equal dimensions from the three versions considered before were investigated to find if those individuals classified as unsatisfied in the group with non weighted items, would be the same unsatisfied people in the other two groups (where weights were assigned). A low percentage of people were allocated to different groups of satisfaction when scores were not weighted as compared to when

scores did receive a weight (Table 6.2.1).

Table 6.2.1. People classified into different satisfaction groups (satisfied or unsatisfied) in each dimension score when items received weights (from the complementary study and from factor analysis - factor loadings) compared to when items did not receive a weight; sample of 662 subjects.

Dimension	items weighted from complementary study		items weighted with factor loadings	
	satisfied	unsatisfied	satisfied	unsatisfied
<b>Appearance</b>				
.number of cases when no weight was assigned	519	143	519	143
.% of respondents reallocating when weights were assigned	2%	2%	0%	3%
<b>Performance</b>				
.number of cases when no weight was assigned	647	15	647	15
.% of respondents reallocating when weights were assigned	0%	7%	0.6%	0%
<b>Pain</b>				
.number of cases when no weight was assigned	604	58	604	58
.% of respondents reallocating when weights were assigned	0%	7%	2%	2%
<b>Comfort</b>				
.number of cases when no weight was assigned	617	45	617	45
.% of respondents reallocating when weights were assigned	1%	4%	2%	7%

The result confirmed the claim that, when items are

fairly homogeneous differential weighting contributes little to the scoring. After these results, items were treated equally and scores of '+1', '0', '-1', were summed into final scores for each dimension.

### 6.3. Weighting dimensions

To achieve a single total score, dimensions were summed. Since each dimension might have a different weight, a scale, asking subjects to quantify the proportional importance they attribute to the different dimensions, was applied in the main study (Chapter 2 'Methodology'). Each dimension was then weighted according to the value given by each respondent. A single total score was obtained by summing up score dimensions.

Single total scores ranged from 1 to -1. Those who were classified below 0 were called unsatisfied. Those who scored from 0 to .7 were classified relatively satisfied and those above .7 were called satisfied.

To test if this weighting contributed to the results, two versions were compared. The first version consisted of dimensions summed into a single final score without receiving any weight. The second version consisted of dimensions summed into a final score after being attributed the respective weights obtained from the scale. Correlation between them was high ( $r = +.9948$ ,  $p < 0.001$ ). After that, groups of people who were classified as satisfied, relatively satisfied and unsatisfied in each version were compared to find if people

were allocated in different groups of satisfaction for the different versions. The unsatisfied group presented a considerable difference in the number of people when the two versions were compared. Forty-seven percent of people who were classified as unsatisfied in the first (non weighted) version were reallocated to the relatively satisfied group in the second (weighted) version (Table 6.3.1).

Table 6.3.1. Satisfaction categories of the total score of the instrument when weights were assigned to dimensions and when weights were not assigned.

Total score when weight was not assigned	Total score when weight was assigned			Total
	Unsatisfied	Relatively satisfied	Satisfied	
Unsatisfied	16	14	0	30
Relatively satisfied	0	268	5	273
Satisfied	0	2	357	359
Total	16	284	362	662

### 6.3.1. Discussion

Although correlations between the first and second versions were high, the reallocation of 47% unsatisfied subjects when weights were attributed to dimensions, is important. Correlations did not highlight this difference because most people were classified as satisfied or relatively satisfied (n=632), and the unsatisfied group (n=30) was small.

The results suggest that some of those who were unsatisfied had a less severe impact when they scored the importance of dimensions as opposed to when dimensions were treated equally. This suggests that the reallocated group whilst having a similar final score to those who remained in the unsatisfied group, did not have such severe oral impacts on their daily living. Weighting dimensions does select groups according to the importance they assign to these dimensions in their daily life. Weighting appears to be a step forward in understanding impacts caused by oral disease. ||

Tests carried out to validate the instrument are discussed in the following chapter.

## CHAPTER 7

### TESTING THE INSTRUMENT

The main objective of this thesis was to develop an instrument to assess the oral impacts on the quality of daily living. Several tests are required to develop a measure of health. Firstly, an item analysis was conducted to select items and check the homogeneity of the questionnaire. Secondly, factor analysis was done to investigate the grouping of items within dimensions. Then, reliability and validity were established for the scale and the questionnaire. Tests conducted on this instrument used data from the pilot, main and complementary studies.

#### 7.1. Analysis of the questionnaire

An initial analysis was performed using data from the main study to test how items were related to each other. For that, two tests were conducted; an inter-item correlation and an item-total correlation. The inter-item correlation checked the existence of highly correlated similar questions. It is used to identify questions that may be measuring the same thing (Streiner and Norman, 1991). The item-total correlation consists of the correlation of the individual item with the scale total omitting that item (Nunnally, 1978). This test checks the homogeneity of the scale. Questions should correlate with the total score above 0.20; otherwise the item

should be discarded (Kline, 1986).

Three different groups were analyzed in the experiment above. People who did not wear a partial prosthesis or full denture, were denoted group one (n=465); people who wore a partial prosthesis and did not wear full denture, were denoted group 2 (n=106); and those who had full denture plus or minus a partial prosthesis, were denoted group 3 (n=91). For the inter-item correlation, for all three groups, the following questions had correlations above 0.80 between each pair;

1. Halitosis / discomfort with halitosis (group 1= +0.96, group 2= +0.97, group 3= +0.99).
2. Changing way of preparing food / displeasure at changing way of preparing food ( group 1= +0.87, group 2= +0.99, group 3= +0.99).
3. Loose teeth / displeasure with loose teeth (group 1= +0.88, group 2= +0.89, group 3= +0.86).
4. Spontaneous pain / discomfort because of pain (group 1= +0.98, group 2= +0.99, group 3= +0.99).
5. Pain when eating (hot or cold) / discomfort because of this pain (group 1= +0.95, group 2= +0.94, group 3= +0.90).
6. Changing types of food eaten because of pain / displeasure caused by changing types of food eaten because of pain (group 1= +0.91, group 2= +0.84, group 3= +0.99).
7. TMJ pain / discomfort because of this pain (group 1= +0.96, group 2= +0.99, group 3= +0.90).
8. Sensitivity to hot or cold because of gingival recession / discomfort because of this sensitivity (group 1= +0.94,

group 2= +0.96, group 3= +0.81).

Additional-questions used in the questionnaire for those who wore a partial prosthesis and for those who had full denture were;

1. Pain because of partial prosthesis / discomfort because of this pain ( group 2= +0.94).
2. Changed flavour of food because of full denture / displeasure because of changed flavour of food (group 3= +0.99).
3. Pain because of full denture / discomfort because of this pain (group 3= +0.99).
4. Difficulty talking because of full denture / displeasure because of difficulty talking (group 3= +0.80).

The following pairs of questions had correlations above 0.80 for one group and above 0.70 for the other two groups;

1. Avoid showing teeth when talking / avoid showing teeth when smiling (group 1= +0.85, group 2= +0.76 and group 3= +0.70).
2. Satisfaction showing teeth when talking / satisfaction showing teeth when smiling ( group 1= +0.80, group 2= +0.75 and group 3= +0.79)
3. Food packing / discomfort because of food packing (group 1= +0.70, group 2= +0.79 and group 3= +0.85).
4. Bleeding gums / discomfort because of bleeding gums (group 1 = +0.77, group 2= +0.70 and group 3= +0.82).

Inter-item correlation linked questions 'Changing types of food because of teeth', 'Changing types of food because of partial prosthesis', 'Changing types of food because of full

'denture' were linked with the question about 'Displeasure because of changing food'.

In group one (those who did not wear a partial prosthesis or full denture) only the first question was asked since no one had a prosthesis, and the correlation was 0.86. In group 2 (those who wore partial prosthesis and did not wear full denture) the first and second questions were asked. The correlation with the fourth item was 0.59 for the first question and 0.70 for the second question. In group three (those who wore full denture, plus or minus a partial prosthesis), only the third question had a significant correlation with the fourth item of 0.78.

One question was excluded for each pair of items which had correlations above 0.80 for all three groups or had correlations above 0.80 for one group and above 0.70 for the other two groups. This was done because items tapping the same trait are expected to be correlated, but not too correlated. Two highly correlated items in a pair were measuring the same thing.

From the above list the following questions were retained;

1. Halitosis
2. Changing way of preparing food
3. Loose teeth
4. Spontaneous pain
5. Pain when eating/ hot or cold
6. Changing types of food eaten because of pain
7. TMJ pain

8. Sensitivity to hot or cold because of gingival recession
9. Pain because of partial prosthesis
10. Changed flavour of food because of full denture
11. Pain because of full denture
12. Difficulty talking because of full denture
13. Avoid showing teeth when smiling
14. Satisfaction showing teeth when smiling
15. Food packing
16. Bleeding gums
17. Changing types of food eaten because of teeth
18. Changing types of food eaten because of partial prosthesis
19. Changing types of food eaten because of full denture

Of the basic questionnaire 13 items which had high correlations were excluded leaving the instrument with 36 questions. The questionnaire for those who wore a partial prosthesis had 14 items excluded, resulting in a total of 42 items. The questionnaire for those who had full denture had 17 questions excluded, resulting in a 45 items instrument. The questionnaire for those who wore full and a partial prosthesis had 18 items excluded leaving a total of 49 questions.

The other test conducted was the item-total correlation. This analysis was done with the items that passed the previous test. Items were grouped according to their respective dimension and then analysed. The three groups mentioned before were tested. Some items which had a low correlation for one or two of the groups were kept in the scale, whenever they had correlations above 0.20 for the remaining group/groups.

After performing inter-item and item-total correlations

a statistical analysis of the way items should be grouped into dimensions was performed. For this, factor-analysis was used.

## 7.2. Factor analysis

Factor analysis is used to identify a relatively small number of factors that can be used to represent relationships among sets of many interrelated variables (Norusis, 1990). That is, using the pattern of intercorrelations among answers to questions, the analysis forms groups (or factors) that appear to measure common themes, each factor being distinct from the others (McDowell and Newell, 1987). In this study because a categorical scale was used, prior to using factor analysis, questions were ranked. To achieve a simple structure and enhance the interpretability of the factors, rotation was applied. The most commonly used factor analysis method is the varimax method, which attempts to minimize the number of variables that have high loadings on a factor (Norusis, 1990). The varimax method was used in this study.

The basic questionnaire, consisting of 36 items, was tested. The first step was to determine the number of factors necessary to represent the data. For this, the percentage of total variance explained by each factor was examined. Six factors explained more than 50% of the total variance. Residuals were at an acceptable level (28%). Items were considered belonging to a factor when their factor loadings were above 0.3 (Spanier and Lewis, 1980) (Appendix 11).

When comparing this result with the initial instrument,

some modifications were made. The initial questionnaire consisted of 36 items distributed in four dimensions of appearance, pain, comfort and performance. A list of items included in the initial questionnaire and how they were originally allocated within dimensions is presented below (Table 7.2.1).

Tablee 7.2.1. List of items included in the initial questionnaire and their respective dimensions.

Appearance dimension

- Satisfaction with teeth
- Satisfaction with appearance of teeth
- Satisfaction with colour of teeth
- Satisfaction with position of teeth

Pain dimension

- Spontaneous pain
- Pain when eating/ hot or cold
- Changing food because of pain
- TMJ pain

Comfort dimension

- Worry with teeth, partial prosthesis or full denture
- Food packing
- Halitosis
- Loose teeth
- Satisfaction with gums
- Bleeding gums
- Sensitivity to hot or cold because of gingival recession

Performance dimension

- Avoid showing teeth when smiling
- Satisfaction showing teeth when smiling
- Changing types of food because of teeth
- Changing way of preparing food
- Capacity to chew
- Satisfaction with chewing
- Capacity to bite
- Satisfaction with biting
- Work capacity affected by appearance of teeth
- Work capacity affected by pain
- Work capacity affected by eating, talking
- Contact with people affected by appearance of teeth
- Contact with people affected by pain
- Contact with people affected by eating, talking
- Romance affected by appearance of teeth
- Romance affected by pain
- Romance affected by eating, talking
- Sleep affected by pain
- Stress caused by pain
- Self-confidence affected by teeth
- Embarrassment caused by teeth

#### 7.2.1. Results of factor analysis

Items which are preceded by the sign: \* , are those that were allocated to the same dimension as in the original questionnaire. Questions reallocated from the original categories have their original categories in parenthesis (Table 7.2.1.1).

Table 7.2.1.1. Results of factor analysis: List of items included in the questionnaire and their respective dimensions.

**Appearance dimension**

- \*. Satisfaction with teeth
- \*. Satisfaction with appearance of teeth
- \*. Satisfaction with colour of teeth
- \*. Satisfaction with position of teeth

**Pain dimension**

- \*. Spontaneous pain
- \*. Changing food because of pain
- \*. Pain when eating / hot or cold
- . Work capacity affected by pain (performance)
- . Stress because of pain ( performance)
- . Bad sleep because of pain ( performance)

**Comfort dimension**

- \*. Halitosis
- \*. Bleeding gums
- \*. Food packing
- \*. Loose teeth
- \*. Satisfaction with gums
- \*. Sensitivity because of gingival recession
- \*. Worry about teeth, partial prosthesis or full denture

**Performance dimension**

- \*. Work capacity affected by appearance of teeth
- \*. Work capacity affected by eating, talking
- \*. Contact with people affected by appearance of teeth
- \*. Contact with people affected by eating, talking
- \*. Contact with people affected by pain
- \*. Romance affected by pain
- \*. Romance affected by eating, talking
- \*. Self-confidence affected by teeth
- \*. Embarrassment caused by teeth
- \*. Romance affected by appearance of teeth
- \*. Avoid showing teeth when smiling
- \*. Satisfaction with smile

**Fifth dimension**

- . Capacity to chew (performance)
- . Satisfaction with chewing (performance)
- . Capacity to bite (performance)
- . Satisfaction with biting (performance)

**Sixth dimension**

- . Changing way of preparing food (performance)
- . Changing types of food because of teeth (performance)

Comparing the original questionnaire with the one suggested by factor analysis, shows that the questions allocated to appearance and comfort were the same in both cases. For pain, of the initial group of four questions, three were kept in the dimension while the other, TMJ pain, because of a too low factor load (below 0.3), was excluded. Extra questions were included in the pain category. These questions may have been allocated there because they are items about daily activities linked with pain.

The performance dimension has shown major differences. Some of its questions were allocated to the pain category, others about chewing and biting were allocated to a fifth dimension and others were included in a new sixth dimension.

Overall, of 36 questions, 26 (72%) had their dimension confirmed by the test, 9 (25%) were included in other dimensions and 1 (3%) did not have a minimal score to be analyzed.

From these results a new questionnaire was constructed. It was composed of the same items, but involving a new dimension, eating restriction. This category was obtained by joining the fifth and sixth groups obtained by factor analysis. Items included in these groups came from the original general performance dimension. The new questionnaire has five dimensions. Of these, appearance, comfort and pain, are the same as in the original instrument and performance and eating restriction, were part of the performance group in the original questionnaire (Table 7.2.1.2).

Table 7.2.1.2. List of items within each new category.

General performance

- Work capacity affected by appearance of teeth
- Work capacity affected by eating, talking
- Contact with people affected by appearance of teeth
- Contact with people affected by eating, talking
- Contact with people affected by pain
- Romance affected by pain
- Romance affected by eating, talking
- Self-confidence affected by teeth
- Embarrassment caused by teeth
- Romance affected by appearance of teeth
- Avoid showing teeth when smiling
- Satisfaction with smile
- Work capacity affected by pain
- Stress because of pain
- Bad sleep because of pain

Eating restriction

- Capacity to chew (performance)
- Satisfaction with chewing (performance)
- Capacity to bite (performance)
- Satisfaction with biting (performance)
- Changing way of preparing food (performance)
- Changing types of food because of teeth (performance)

Questionnaires with extra questions for those who wore a partial prosthesis and full denture presented some changes also. Items which are preceded by the sign \*, are those that were allocated to the same dimension as in the original questionnaire. Questions which were allocated to a different dimension from that in the original questionnaire have their original category in parenthesis (Table 7.2.1.3, 7.2.1.4).

Table 7.2.1.3. Items included in the questionnaire of those who wore a partial prosthesis.

Appearance dimension

- \* . Satisfaction with partial prosthesis
- \* . Satisfaction with appearance of partial prosthesis
- \* . Satisfaction with colour of partial prosthesis

Eating Restriction dimension

- . Pain because of partial prosthesis (pain)
- . Changing types of food because of partial prosthesis (performance)

Items about appearance were allocated to the same dimension as in the original questionnaire. Two items were included in the 'eating restriction dimension'. One belonged to the 'performance group' of the original instrument and was kept in this new dimension, since it taps the same trait of the category. The other item will not be included in the 'eating restriction' dimension since it is related to its original category, pain.

Table 7.2.1.4. Items included in the questionnaire for those who wore full denture.

Appearance dimension

- \* . Satisfaction with full denture
- \* . Satisfaction with appearance of full denture
- \* . Satisfaction with colour of full denture

Comfort dimension

- . Difficulty to talk because of full denture (performance)
- . Pain because of full denture (pain)

Eating restriction dimension

- . Feeling of a full mouth because of full denture (comfort)
- . Changed flavour of food because of full denture (comfort)

Items about appearance were allocated to the same dimension as in the original questionnaire. Items included in the original comfort dimension were kept in this dimension. Theoretically the item 'pain because of full denture' was kept in the pain category although it was included in the comfort dimension by factor analysis. The item was included in the comfort dimension because there was not a high correlation between those who had tooth pain and those who wore full denture. The item 'feeling of a full mouth' which was allocated to a new eating restriction category by factor analysis was kept in the comfort dimension. The item 'changed flavour of food', was kept in the new eating restriction category to which it had been moved by factor analysis.

### 7.3. Reliability

Reliability was tested in the pilot and in the main study. Internal reliability and test-retest reliability were used to check the stability of the measure.

#### 7.3.1. Reliability tested in the pilot study

Reliability of the questionnaire and the scale were tested during the clinical calibration. When clinical examinations were repeated, respondents were re-interviewed. A test-retest reliability was done to check stability of the instrument. A good result was obtained; 0.89 for the questionnaire and 0.79 for the scale.

### 7.3.2. Reliability tested in the main study

When clinical examinations were repeated to assess consistency in the main study, interviews were repeated. Test-retest reliability was done on 84 basic questionnaires and scales to check the stability of the instrument. For that, the SPSS statistical package was used and the result has shown a high stability for both the questionnaire (0.87) and the scale (0.78). Internal consistency analysis of the basic questionnaire and the scale were also done by using data collected from the main study. Cronbach's coefficient alpha test was applied. The result showed a high internal consistency for the basic questionnaire of 0.87. For the scale an acceptable level (above 0.50 -Ware and Brook, 1981) of 0.59 was obtained. The reliability of each dimension in the questionnaire was tested as well. All groups of items presented an acceptable internal consistency. Cronbach's coefficient alpha for appearance was 0.78, for pain was 0.50, for comfort was 0.52, for eating restriction was 0.73 and for performance was 0.89.

### 7.4. Validity test

The questionnaire and the scale were tested for face, content and construct validity. Since there is no 'gold standard' for health or quality of life, criterion validity was not an appropriate test for this study. Face and content validity were established during the pre-pilot (open

interviews) and pilot study. Construct validity of the questionnaire was tested during the main study. Construct validity of the scale was tested using the data of the complementary study.

#### 7.4.1. Face validity

Face validity of the questionnaire and the scale were established during the pilot study. People were asked to explain in their own words what they understood of each question in the questionnaire and what they understood of each dimension involved. This procedure checked if respondents were answering what they were being asked. Since most of the topics came from lay experience during open interviews, respondents had no difficulty in relating with such material or seeing its relevance.

#### 7.4.2. Content validity

Content validity was established during the development of the instrument, when open interviews were done and the literature reviewed. Interviews were conducted with a group of Portuguese people and main topics raised by them have been considered. Furthermore after a thorough examination of the literature, four main dimensions were selected: appearance, comfort, pain and general performance. Then, a list of topics was built from open interviews and literature review, in order to specify items which could reflect the meaning associated

with each dimension. Therefore the universe of the variables to be measured in relation to oral conditions was compiled.

Dimensions included in the scale were based on the literature review and corresponded to items which were raised in the open interviews.

#### 7.4.3. Construct validity

##### 7.4.3.1. Construct validity of the questionnaire

Construct validity was done using the main study data.

Two tests were performed: a correlation of the questionnaire with three clinical measures and an analysis of score dimensions distribution in two groups of different oral status.

The first test, Spearman correlation, was done between the instrument, which measures the impact oral status has on people's lives, and clinical indices, which measure oral status. A total score for the instrument was used. This score was obtained from the sum of the dimensions. Two situations were tested. One where dimensions were weighted and another where dimensions were not weighted (implicitly this is equivalent to having equal weight). The clinical indices to be compared with the questionnaire were three: DMFT, the 'functional' measure and T-HEALTH. The traditional DMFT, total number of decayed, missing and filled teeth, intends to measure oral status (Klein et al, 1938). The 'functional' measure (Sheiham et al, 1987) is based on aggregating the

number of filled teeth with the number of sound teeth with no decay, each being given equal value. The third measure, the T-HEALTH (Sheiham et al, 1987), attributes an arbitrary weight to the status of the tooth (sound tooth = 4, filled tooth = 2, decayed tooth = 1 and missing tooth=0) (Table 7.4.3.1.1).

Table 7.4.3.1.1. Spearman correlation between the final score of the instrument (when dimensions received weight and when they were treated equally) with clinical measures.

Clinical measures	final score with weight	final score without weight
DMFT	-.412	-.351
T-HEALTH	+.498	+.499
FUNCTIONAL MEASURE	+.519	+.476

P<0.001

The clinical measures which had a higher correlation with the total score were those which better reflected the 'quality' of oral status (functional measure and T-HEALTH). A lower correlation was obtained for the DMFT, which is criticized for failing to indicate changes in the quality of the teeth that have already been attacked by disease (Birch, 1986).

Although there are differences between clinical indices, all of them had a significant correlations with the final score of the measurement. These results suggest that 'oral status' (clinical measures) had a significant correlation with the 'impact oral status has on people's quality of life' (subjective measure).

The second test conducted was a comparison of dimension score distributions in two groups having different oral

statuses. The Kruskal-Wallis one-way anova test was used between the following groups:

- . Appearance score and anterior teeth: one group with filled or sound anterior teeth and another with at least one decayed tooth or missing anterior teeth,
- . Performance score and anterior teeth: one group with filled or sound anterior teeth and another with at least one decayed tooth or missing anterior teeth,
- . Performance and decayed teeth: one group with no decayed teeth, and another with at least one decayed tooth,
- . Pain score and decayed teeth: one group with no decayed teeth and another with at least one decayed tooth,
- . Comfort and bleeding: one group with no bleeding and another with at least one gingival area with bleeding,
- . Comfort and calculus: one group with no calculus and another with at least calculus on one tooth,
- . Comfort and periodontal pocket: one group with no pocket and another with at least one periodontal pocket.

For all groups compared, chi-square was significant, showing that the distribution between groups was different, according to their oral status (Appendix 12).

#### 7.4.4. Validation of the scale

The scale used in the main study to collect data on the importance respondents attributed to dimensions was validated. To validate the scale, data obtained in the complementary study (Chapter 5 'Complementary study') were used. These data

? data

consisted of the weight people attributed to dimensions identical to those used in the scale of the main study. One part of the questionnaire used in the complementary study compared the five dimensions (appearance, comfort, performance, pain and eating restriction), asking respondents to weight each of them. The other part of the questionnaire of the complementary study analysed the weight people attributed to each item used in the questionnaire of the main study, comparing the 36 items.

Two tests were conducted. One involved a comparison of the order in which dimensions were ranked in the two parts of the questionnaire of the complementary study. The other investigated the different magnitudes of weight attributed to each dimension for the two different scales obtained from the two sections of the complementary study. The objective of doing these tests was to investigate if people would weight dimensions in a similar way to that in which they would weight items included in those dimensions.

In the first test, mean scores of weight attributed to each item, when the 36 items were compared, were calculated. Subsequently, items were grouped according to their respective dimensions and a mean score for items in each dimension was calculated. These mean scores represent the importance respondents attribute to items in the corresponding dimensions. These results were then compared with the results from the previous section related to 'weighting dimensions' (mean scores of weights attributed to each dimension). The order of importance of dimensions in each result was checked

(Table 7.4.4.1).

Table 7.4.4.1. Comparison of ranking of dimensions when subjects attributed weights to items and when respondents attributed weight to dimensions - Scale validation.

Dimensions	All items weighted		Dimensions weighted	
	Mean score	(SD)	Mean score	(SD)
Pain	598.7	146.5	1252.4	1452.5
Comfort	532.5	108.2	1082.4	1376.2
Performance	533.4	96.9	1051.4	1133.7
Eating Restriction	502.9	49.5	900.0	742.3
Appearance	449.9	7.8	489.0	70.3

Results for both scores were ranked in a similar order, except for performance and comfort which were ranked differently although with a small difference between ranks.

The second test used was the Wilcoxon signed-rank. This was done to investigate the magnitude of differences between the weight attributed to each dimension in both sections (Norusis, 1990). Because all scales might have the same total weight of 1, when adding the weight attributed to dimensions (Chapter 2 'Methodology'), prior to testing the different magnitude of weights attributed to dimensions, the proportion of those weights had to be calculated for each respondent. Proportions of the scale in which respondents weighted dimensions were calculated as done in the main study (Chapter 2 'Methodology'). Proportions from the scale when respondents weighted items were computed by taking the average weight for

each category and then calculating each category proportion as in the main study (Chapter 2 'Methodology'). Proportion of dimensions obtained from both sections were compared to test the difference of magnitude between them. No significant difference was found between the proportion of weights attributed to dimensions and the proportion of weights attributed to items within the dimensions ( $p<0.05$ ), except for the appearance dimension ( $p=.0002$ ). These results suggest that except for the appearance dimension there was no significant difference, in terms of weighting, between respondents weighting dimensions directly or respondents weighting items within the dimensions.

#### 7.4.4.1. Discussion

Overall, results presented a close similarity when comparing weights applied to categories and weights applied to the corresponding items. Although performance and comfort were ranked in different orders when comparing dimensions and weighted items, no significant difference in magnitude between the weights attributed to performance and comfort and the weights attributed to items within the respective categories were found. Appearance, despite showing a difference in the magnitude of results for the two approaches used to weight dimensions, was ranked in the same order, and was found to be the least important of the dimensions in both results.

A suggestion of improvement for future studies is related to the order in which the questionnaire and the scale

should be presented to respondents. The questionnaire should be presented first, explaining that questions about discomfort, pain, appearance, eating restriction and performance related to oral status are going to be asked. Then, after finishing the interview, the scale should be presented and respondents then asked how they would rank comfort, appearance, not feeling pain, not having eating restriction and performance according to their importance.

After testing the instrument, results of the data collected during the main study were analysed to check if the measure selected different impacts in the population. These results will be presented in the next chapter.

## CHAPTER 8

### RESULTS

#### 8.1. Characteristics of subjects

Personal interviews and clinical examinations were completed on 662 individuals in the target age range of 35 to 44. The sample was divided according to their oral status (groups for low, medium and high DMFT and a group for those who wore an upper denture), and by gender and social class.

Although the sample was selected by DMFT and full upper denture status, during the analysis a difference was noticed, in terms of impact, between those who had missing teeth and did not wear a prosthesis and those who had missing teeth and had them replaced. Respondents who had the same number of missing teeth had different subjective impacts whether they had them replaced or not. Therefore for a better understanding of the results the sample was finally divided into three groups; those who did not wear a prosthesis (n=465), those who wore a partial prosthesis (n=106) and those who had a full upper denture (n=91) (Table 8.1.1).

Table 8.1.1. Distribution of the sample by sex, social class and DMFT status.

	All subjects (n=662)	Subjects who do not wear a prosthesis (n=465)	Subjects who wear a partial prosthesis (n=106)	Subjects who wear full denture (n=91)
<b>Gender</b>				
Male	359 (54%)	256 (55%)	58 (55%)	45 (49%)
Female	303 (46%)	209 (45%)	48 (45%)	46 (51%)
<b>Social class</b>				
High	304 (46%)	277 (59%)	27 (25%)	---
Low	358 (54%)	188 (41%)	79 (75%)	91 (100%)
<b>DMFT</b>				
High	270 (41%)	121 (26%)	59 (56%)	91 (100%)
Medium	209 (32%)	172 (37%)	37 (35%)	----
Low	182 (27%)	172 (37%)	10 (09%)	----

## 8.2. Clinical characteristics of the sample

Mean scores for decayed, missing and filled teeth and periodontal status were calculated for four different groups: the total sample (group 1), those who did not wear a prosthesis (group 2), those who wore a partial prosthesis (group 3) and those who wore a full upper denture (group 4). Filled and missing teeth did not show a significant difference between gender in group 1 (Appendix 13, table AP13.1). For group 2, in addition to filled and missing teeth, decayed teeth did not show, as well, a significantly different distribution between sex (Appendix 13, table AP13.3). The same observations applied to group 3 between DMFT levels (Appendix 13, table AP13.5). For group 4, only decayed teeth presented a significantly different distribution between gender ( $p<0.01$ )

(Appendix 13, table AP13.7). Periodontal status had no significantly different distribution for the different DMFT levels on the first, second and third groups and on different sexes for the fourth group (Appendix 13, tables AP13.2, AP13.4, AP13.6, AP13.8).

### 8.3. The relationship between the level of satisfaction and oral status

Studies have shown that although clinical data have a weak correlation with subjective impacts, some of those correlations are significant, suggesting that clinical status does indeed cause some subjective impact (Cushing, 1986; Rosenberg, 1988; Gooch, 1989; Chen, 1991; Locker, 1992). In order to test if the instrument was able to discriminate between groups which had different levels of subjective impact an analysis of how subjective impact was distributed in the sample and how oral status, social class and gender varied according to those impacts was done. Firstly, to investigate subjective impact data obtained by questionnaire, people were grouped into three different levels of impact: those who were satisfied with their mouths (scores from 0.7 to 1.0), those who were relatively satisfied (scores from 0.69 to 0) and those who were unsatisfied (scores below 0). Secondly, mean scores of oral status were calculated for each of these groups to assess if clinical differences existed between them. Distributions of oral status between the groups were statistically tested to check if any significant difference

would result. Because the subjective impact varied according to whether respondents who had missing teeth, had them replaced or not, the sample was divided into three groups: those who did not wear a prosthesis (n=465), those who wore a partial prosthesis (n=106) and those who wore full upper denture (n=91).

#### 8.3.1. The relationship between the level of satisfaction and oral status for those who did not wear a prosthesis

For each group of satisfaction, for those who did not wear a prosthesis, mean scores of oral status were calculated and distributions of oral status were statistically tested. All subjective dimensions were tested in this way: appearance, comfort, pain, performance, eating restriction and total score of the questionnaire. For each of these dimensions, respondents were classified as satisfied, relatively satisfied or unsatisfied according to their questionnaire scores.

Differences of clinical oral status were observed between groups of satisfaction in all dimensions considered with the exception of pain. The main difference observed occurred for appearance. There, the position of missing teeth and the number of decayed teeth affected the levels of satisfaction. More specifically, only those who were unsatisfied had anterior missing teeth (Appendix 15, table AP15.2). In addition, on average those who were relatively satisfied presented one premolar missing; a tooth whose position can compromise aesthetics. Furthermore, those who were satisfied

had their anterior and premolar teeth sound or filled. Respondents who were satisfied with appearance had no decayed teeth. Respondents who were relatively satisfied had a lower number of decayed teeth than those who were unsatisfied with appearance (Appendix 15, table AP15.2).

For comfort, differently from all the other dimensions considered, the satisfied group was the one which presented the lowest number of filled teeth (Appendix 15, table AP15.3). For all the other categories, including that for total score of the questionnaire, the satisfied group had the highest number of filled teeth and lowest number of decayed and missing teeth (Appendix 15). One observation that appears relevant here, is that, although the DMFT index counts filled teeth with the same score as decayed and missing teeth, the results just described suggest otherwise. They suggest that filled teeth did not contribute to negative impacts between respondents, in most of the dimensions (except for comfort), as much as decayed and missing teeth did.

There was no difference for the mean scores for both decayed and filled teeth for the three different groups of satisfaction in the pain dimension. On the other hand, by statistically testing the distribution of decayed teeth for each of these three different groups, a significantly different distribution of decayed teeth ( $p<0.05$ ) was found between groups (Appendix 15, table AP15.4). Despite these results, it should be stressed that the clinical examination cannot assess if decayed teeth are causing pain or not. Therefore, it cannot simply be assumed that decayed teeth do

necessarily cause pain. Generally we can conclude that people with a higher number of decayed teeth have a higher probability of experiencing dental pain. Therefore further investigation and specific clinical examination should be conducted to clarify this important area.

For the performance dimension the number of decayed teeth decreased from 7 to 1 and the number of missing teeth decreased from 10 to 3 across the range from the unsatisfied to the satisfied groups. Filled teeth increased from 2 to 9 over the same range (Appendix 15, Table AP15.1). These results suggest that the worse the oral status, the worse the impact of performance on respondents' daily living.

After carrying out factor analyses, the results obtained suggested that performance should be divided into two categories: one which we called a performance dimension and another which we called an eating restriction dimension. When levels of satisfaction for those two new categories were analyzed, the new performance dimension did not show any difference in terms of the results obtained from those previously obtained for the original performance category. On the other hand, the same was not true for eating restriction (Appendix 15, Tables AP15.6, AP15.7). For this dimension, the unsatisfied and relatively satisfied groups had 7 posterior missing teeth, a similar result to that reported by Kayser (1981). The difference observed between those two groups of satisfaction was on the number of anterior missing teeth; the unsatisfied group had 3 and the relatively satisfied 1 missing anterior. The eating restriction dimension which includes

items related to chewing and biting, thus appears to have identified individuals who are affected by the number of anterior missing teeth. Those who were satisfied with eating had no anterior absent teeth and had 2 posterior missing teeth. The results suggest that the original performance dimension and the new performance dimension presented similar results overall. On the other hand, items in the eating restriction dimension had their impact masked whilst included in the original performance dimension. The results confirm the importance of having an eating restriction dimension separate from the original performance dimension.

Total scores for each of the different dimensions involved were added together to give a combined final score. This final score was also grouped into different satisfaction levels, as was done before for the other dimensions. For this combined dimension clinical differences were observed between the different groups of satisfaction. For example, the number of decayed teeth decreased from 5 to 0, the number of missing teeth decreased from 9 to 2 and the number of filled teeth increased from 4 to 9 as satisfaction level increased (Appendix 15, table AP15.5). This total score reflects the overall combined subjective impact on people's daily living suggesting that a higher number of decayed and missing teeth occurs in those who have more negative impacts on their daily living.

Overall, for all dimensions, oral status improved with satisfaction level; those who were unsatisfied had the worst status while those who were satisfied had the best. These

differences of oral status and periodontal status were statistically significant ( $p<0.05$ ) (Appendix 14).

When considering the results outlined above it should be noted that three of the dimensions involved had a small number of people in the unsatisfied group; performance dimension (11 people), eating restriction (14 people) and total score of the instrument (13 people). As a result, although significant clinical and statistical differences were found between these groups of unsatisfied subjects when compared with the groups of relatively satisfied and satisfied subjects, for the same three dimensions referred above, groups with a low number of people cannot be considered as a reliable test group for the instrument. Only the results involving the relatively satisfied and satisfied groups in those dimensions should therefore be considered.

#### 8.3.2. The relationship between the level of satisfaction and oral status for those who wore a partial prosthesis

Two groups were considered from those wearing a partial prosthesis: the relatively satisfied and the satisfied. The unsatisfied group could not be considered in this sample, since for all associated dimensions there were always less than 30 unsatisfied subjects. No clinical difference of oral and prosthesis status could be found between the satisfied and relatively satisfied groups for all the dimensions considered. Oral status between the groups was similar and most prostheses were assessed as good (Appendix 15, from table

AP15.8 to table AP15.14).

### 8.3.3. The relationship between the level of satisfaction and oral status for those who wore full upper denture:

Two groups of satisfaction were considered for those wearing a full upper denture; the satisfied and the relatively satisfied ones. The unsatisfied group could not be considered here because it had less than 30 subjects. No clinical difference between the groups was found. Oral status were similar and dentures were in good condition (Appendix 15, from table AP15.15 to table AP15.21).

### 8.4. TMJ and malocclusion

Most people included had no problems with their temporomandibular joints. Therefore this item caused no social impact on the sample. No malocclusion problems were found among respondents and consequently this condition was not used to analyse impacts obtained from the questionnaire.

### 8.5. Association between clinical and socio-psychological measures of oral health

Association between clinical and subjective measures of oral health were tested. Correlations between scores for the different dimensions and the total score of the questionnaire were computed for decayed, missing and filled teeth, DMFT, T-

HEALTH, function teeth and periodontal status. On the whole, correlations were weak, although most of them were significant ( $p<0.001$ ), with the exception of filled teeth and gingival recession (Tables 8.5.1, 8.5.2, 8.5.3, 8.5.4). Decayed and missing teeth showed a significant negative association for all dimensions, with the exception of comfort ( $p<0.001$ ) (Tables 8.5.1, 8.5.2). This indicates that as the number of decayed and missing teeth decreases, scores for dimensions increase; people become more satisfied. Filled teeth only showed a significant positive association for performance while its only negative significant association was with comfort ( $p<0.001$ ) (Tables 8.5.1, 8.5.2). Therefore, as the number of filled teeth increases, the score for performance increases; people become more satisfied with performance. On the other hand as the number of filled teeth increases the score for comfort decreases; people become more dissatisfied with comfort. This reinforces previous results in this study where the satisfaction categories were compared with clinical oral status. Those who were dissatisfied had more decayed and missing teeth while those with a higher number of filled teeth were more satisfied than those who had less filled teeth (with the exception of comfort where the satisfied group had the lowest number of filled teeth). DMFT showed negative significant associations with all subjective measures; that is, when DMFT increases people are less satisfied ( $p<0.001$ ) (Tables 8.5.1, 8.5.2). T-HEALTH and function teeth, which are indices that attribute low or no value to decayed and missing teeth, had positive significant associations with all

subjective measures, except for comfort which showed a (not) significant correlation ( $p<0.001$ ) (Tables 8.5.1, 8.5.2).

Table 8.5.1. Spearman correlation between clinical and subjective measures (n=662).

	Decayed teeth	Missing teeth	Filled teeth	DMFT	T-HEALTH	Function teeth
Appearance	-.34**	-.24**	.06	-.32**	.33**	.32**
Comfort	-.08	-.07	-.22**	-.17**	-.05	-.04
Performance	-.32**	-.32**	.15**	-.32**	.38**	.39**
Pain	-.19**	-.13**	.03	-.18**	.18**	.18**
Total score	-.33**	-.18**	.01	-.33**	.30**	.27**

\*  $p<0.01$  \*\*  $p<0.001$

Table 8.5.2. Spearman correlation between clinical and the two subjective measures considered after factor analysis (n=662).

	Decayed teeth	Missing teeth	Filled teeth	DMFT	T-HEALTH	Function teeth
Performance	-.36**	-.27**	.17**	-.26**	.32**	.35**
Eating restriction	-.23**	-.29**	.11	-.29**	.33**	.33**

\*  $p<0.01$  \*\*  $p<0.001$

Gingival bleeding, calculus and pocket had a negative significant association with all dimensions except for pain and eating restriction ( $p<0.001$ ) (Tables 8.5.3, 8.5.4). When gingival bleeding, calculus and number of pockets increased respondents' satisfaction decreased in appearance, performance, comfort and in the total score of the questionnaire. Gingival recession was not significantly

associated with any of the dimensions (Tables 8.5.3, 8.5.4).

Table 8.5.3. Spearman correlation between periodontal and subjective measures (n=662).

	Bleeding	Calculus	Pocket	Gingival Recession
Appearance	-.19**	-.19**	-.16**	.04
Comfort	-.18**	-.14**	-.24**	-.07
Performance	-.14**	-.14**	-.18**	.05
Pain	-.07	-.09	-.05	-.01
Total score	-.20**	-.19**	-.20**	-.00

\* p<0.01 \*\* p<0.001

Table 8.5.4. Spearman correlation between periodontal and the two subjective measures considered after factor analysis (n=662).

	Bleeding	Calculus	Pocket	Gingival Recession
Performance	-.16**	-.16**	-.16**	-.02
Eating Restriction	-.10*	-.70	-.19*	-.03

\* p<0.01 \*\* p<0.001

## 8.6. Socio-demographic variables

Two socio-demographic variables were investigated: gender and social class. Clinical oral status for those two groups of variables were compared and scores obtained from the subjective data were analysed.

There was no significant differences by sex in subjective impacts except for comfort, where men were more dissatisfied than women (p<0.05) (Appendix 14). The significant differences

found in oral status by sex were for decayed teeth ( $p<0.01$ ), bleeding ( $p<0.05$ ) and calculus ( $p<0.001$ ). Men had a higher mean score than women for decayed teeth, bleeding and calculus (Appendix 14).

Social class groups had significantly different distributions in subjective impacts scores for all dimensions with the exception of comfort. The two social groups also had significantly different distributions of oral status. Higher social class had less decayed teeth, less missing teeth and more filled teeth than lower social class. Higher social class respondents had less bleeding on probing, less calculus and a smaller number of pockets than lower social class ones (Appendix 14).

The results for comfort were different from all other subjective dimensions for both gender and social class groups. Men were more dissatisfied about comfort and had more bleeding and calculus than women. The lower social class group had more dissatisfied than the higher social class for all dimensions with the exception of comfort. As expected, the lower social class group had more decayed and missing teeth and less filled teeth than the higher social class group. Lower social class also had more bleeding, calculus and number of pockets than the higher social class. Since satisfaction with comfort decreased with the increase in the number of filled teeth, bleeding, calculus and number of pockets (Tables 8.5.1, 8.5.3), there was no significant difference in terms of impact of comfort between the two social classes because both of them had clinical oral status levels which decreased satisfaction

with comfort.

These results demonstrate that the instrument detected differences for different social class groups and for gender. In addition, they also confirm findings from previous studies (Cushing, 1986; Gooch, 1988; Locker, 1992) which also reported different subjective impacts for different groups of social class and gender.

#### 8.7. Regression analysis: comparing studies

Regression analysis was used to compare the results from this study with those from other studies which also conducted the test (Rosenberg et al, 1988; Gooch et al, 1989; Chen, 1991; Locker et al, 1992). This course was chosen despite the criticism of some authors (McClatchie et al, 1983) that find it inappropriate to use regression analysis when the Likert scale is used to collect the data (since this would imply ordinal data). In any case, in our context, results from the other studies which are being compared with the present one did use Likert scales and did use regression analysis.

Regression analysis was staged with groups of predictor variables entering at each step. The dependent variable was chosen to be the total score of the questionnaire. Socio-demographic variables, social class (0= high social class, 1 = low social class) and gender (0= female, 1= male), were included in the first stage. For the second stage number of decayed, filled and missing teeth were all introduced as continuous variables. Finally, for the third stage the number

of teeth with bleeding gums, calculus and pocket, were all introduced as continuous variables (Table 8.7.1). The socio-demographic variables, in the first stage, explained only 3 percent of the variance of the total score of the questionnaire, with social class emerging as a significant predictor ( $p<0.0001$ ). When decayed, filled and missing teeth were introduced in the second stage, R square increased to 0.19. Social class remained as a significant predictor ( $p<0.01$ ) and decayed, missing and filled teeth were significant ( $p<0.0001$ ). When periodontal variables were introduced in the model in the third stage, R square increased to 0.24 and pocket ( $p<0.0001$ ) and calculus ( $p<0.01$ ) were added to the previous significant predictors. At this stage, social class was no longer a significant variable (Table 8.7.1).

Table 8.7.1. Results for total score of the questionnaire regression analysis.

Dependent variable: Total score of the questionnaire							
Stage:	1		2		3		
	B	P	B	P	B	P	
Gender *	---	NS	---	NS	---	NS	
Social class *	-.17	P<0.0001	-.12	P<0.01	---	NS	
R squared		.03					
Number of decayed teeth			-.36	P<0.0001	-.34	P<0.0001	
Number of filled teeth			-.32	p<0.0001	-.32	P<0.0001	
Number of missing teeth			-.25	P<0.0001	-.28	P<0.0001	
Number of teeth with bleeding gums					--	NS	
Number of teeth with calculus					-.14	p<0.01	
Number of teeth with pocket					-.17	p<0.0001	
R squared							.24

\*Entered as dummy binary variables

Note: B - partial regression coefficient

## 8.8. Discussion

From the above results it is possible to infer that our instrument discriminates between different subjective impacts for the different groups involved. Respondents classified in different DMFT levels showed a significant difference in the distribution of scores ( $p<0.01$ ) for all the dimensions in the questionnaire (appearance, comfort, performance, eating restriction and pain and for total score of the

questionnaire) (Appendix 14). Furthermore, when respondents that were classified as being satisfied, relatively satisfied and unsatisfied for subjective impacts had their oral status investigated, the worse the oral status, the worse the subjective impact (Appendix 15). Results of correlations between clinical oral status and subjective impact scores were found to be consistent with the results found when the oral status of respondents were investigated for level of satisfaction. The oral status found in dissatisfied respondents (Appendix 15) showed significant negative associations with subjective measures (Tables 8.5.1, 8.5.2). In addition, the correlation results described above confirm previous studies (Cushing, 1986; Atchinson, 1989; Chen, 1991; Locker, 1992) which reported significant but weak associations between oral status and socio-psychological measures. Cushing (1986) suggested that although relationships between clinical and social variables were weak, those which were significant could be used as a stepping stone to start building a picture of characteristics, both clinical and social, of people who experience dental problems. It should also be pointed out that, in some instances, weak associations between clinical and subjective oral health indicators are to be expected given the nature of the measures employed (Locker, 1992). For example for comfort questions about bleeding, food packing, halitosis and satisfaction with gums (all of which are items that can be associated or not with filled teeth), after being added into a final score, showed a weak, but significant ( $p<0.001$ ), correlation with filled teeth (Table 8.5.1). This

is not unexpected, given that those problems could not only just be caused by filled teeth but could, for example, be caused by decayed teeth as well.

Differences observed on the subjective impact between groups of social class and gender were similar to differences detected in other studies (Cushing et al, 1986; Gooch et al, 1989; Locker, 1992).

Regression analysis results were similar to those in other studies (Rosenberg, 1988; Gooch, 1989; Locker, 1992). Rosenberg (1988) for example, found no association of the subjective measure used in her study and decayed, filled and missing teeth but there was an association with periodontal status and number of dental symptoms. Gooch (1989) after comparing the subjective measure with socio-demographic variables (sex, age, marital status, education and income) found 5% of the variance explained by those variables. After introducing clinical variables (decayed, missing, filled teeth and periodontal status) another 10% of the variance was explained. Decayed teeth and periodontal status were the variables which explained the highest percentage of the variance for Gooch's subjective measure. Chen (1991) analysed 3 subjective dimensions separately; symptom, well-being and function. Age and number of decayed teeth were found to be a significant predictor for all three dimensions. Symptomatic visit to the dentist was significant for symptom and function. Asymptomatic visit to the dentist, general health, missing and filled teeth were found to be significant predictors for Chen's well-being dimension. Locker (1992) after introducing

socio-demographic variables (gender, social class, income, education and marital status) found 7% of the variance of the subjective impact scores explained. Additionally, after introducing clinical variables (number of missing teeth, number of decayed crown, number of decayed root surfaces and mean of the periodontal attachment loss) R square increased to 13%. Locker found, in the first stage, that the significant variables were marital status and income. For the second stage, missing teeth, periodontal attachment loss and income were the significant variables.

Regression analysis results in the present study identified social class as a significant variable. This confirms previous findings which demonstrated that the quality of life of disadvantaged groups is compromised to a greater extent by oral disorders and conditions compared with that of those with higher incomes (Locker, 1992). Likewise, significant clinical variables in this sample were found to be as significant as they were for a previous study (Gooch, 1989). All the reviewed studies including the present study had less than 30% of their subjective measure explained by socio-demographic and clinical variables. Locker (1992) claims that this weak association of clinical variables with indicators of social and psychological impact results because these indicators are mediated by functional and experiential variables and by socio-demographic variables. In addition, Locker maintains that when scores of subjective impacts are added together the relationships of specific impacts with clinical variables are diluted by the other impacts being

added. One conclusion that could therefore be drawn is that the clinical variables associated with subjective impacts are indeed relevant but definitions of need based on clinical and social criteria will differ considerably (Locker, 1992).

## CHAPTER 9

### DISCUSSION

From the point of view of contemporary definitions of health, clinical measures are subject to serious limitations. They convey little about the functioning of either the oral cavity or the person as a whole and nothing about subjectively perceived symptoms such as pain and discomfort (Locker, 1988). These contemporary definitions of health involve both clinical and subjective aspects, and stress that illness can be a result of pathological abnormality and that a person can feel ill without medical science being able to detect disease (Bowling, 1991). In dentistry, a recent definition of oral health, 'Oral health is a standard of health of the oral and related tissues which enables an individual to eat, speak and socialise without active disease, discomfort or embarrassment and which contributes to general wellbeing' (Dept of Health, 1993), reflects those issues. Clinical measures to obtain information on 'active disease' are available, but subjective measures to obtain information on 'a standard of health ... which enables an individual to eat, speak and socialise without discomfort or embarrassment...' are still needed. Confirming this need, a survey conducted in England, indicated that almost three quarters of skilled manual workers had one or more dental impacts at the time they were clinically examined. These impacts were not detected clinically (Sheiham, 1982). Recently, studies have been conducted to develop

measures which highlight subjective and behavioural impacts related to the oral status (Cushing, 1986; Rosenberg, 1988; Gooch, 1989; Reisine, 1989; Atchinson and Dolan, 1990; Slader and Spencer, 1991; Locker, 1992;). Although researchers looked into ways of measuring impacts, no attempt was made to assess the importance of different impacts. For instance, 'is tooth sensitivity more important than the appearance of teeth?'. Furthermore, no attempt was made to assess different weights which reflected the degree of importance different age, gender, social class and cultural subgroups attribute to those impacts (Sheiham, 1982).

In the present study, weights for dimensions, such as appearance, pain, performance and comfort, were determined. Those weights highlighted differences between groups which in spite of having the same total impact scores, were classified into different groups of impact, because of the different degree of importance they attributed to specific dimensions. The instrument therefore appears to reflect the different importance individuals attribute to impacts and how those impacts affect their daily living.

The subjective measure used in this study is a questionnaire which can be adapted to personal interviews if flexibility is needed on a broader range of people. Because an illiterate group was included in this study, an interview technique was used. The response scale used was the Likert scale, since it is simple and offers subtle gradations of response. Its limitation is that it is difficult to establish equal intervals between the various scale levels. It can often

be resolved by treating the data ordinally or by employing analysis techniques that are robust against minor violations of statistical assumptions. Tests which were conducted in this study tried to overcome this problem by conducting Spearman correlation before proceeding with factor analysis, and by using other tests which are appropriate to this kind of data.

Reliability was checked by means of test-retest reliability, in order to observe the stability of the instrument, and by kappa-statistic, to check internal consistency. The kappa-statistic, which typically yields a lower reliability coefficient than alternative procedures, appears to be a rigorous procedure to test the instrument.

Criterion validity was not tested since there is not a 'gold standard' to be measured against. Face validity, construct validity and content validity were conducted. The cross-cultural validity was not tested. Nevertheless, since this instrument can be used internationally, or among various cultural or ethnic groups within a single country this test should be conducted when the situation requires. Cultural differences can exert significant influence on assessment of the subjective experience of patients. In translating an instrument from one language to another it is important to ensure that the questions are as close to their original meaning as possible. While complete cross-cultural equivalence may be unattainable, the use of standard 'forward-backward' translation procedures can alleviate many of the basic language problems (Sartorius, 1979). Typically this is an iterative process requiring several rounds before equivalence

can be approximated.

This instrument was not tested for sensitivity since it was a cross-sectional study.

Sensibility, that is, the practicality or feasibility of a proposed data collection method, highlights the length of the instrument (Feinstein, 1978). If it is too long it can be a burden for participants and for research staff. In addition, special consideration should be given to statistical expertise available for such projects. It should not be assumed that biostatisticians will have the necessary background for analyzing psychosocial data. Conversely, statisticians who are well versed in social science statistics will often be unfamiliar with the analytic procedures necessary for synthesizing psychosocial and medical data (eg. for purposes of utility analysis). || ?

The instrument developed involves 36 questions, which can be asked as a questionnaire or interview, taking, on average, from 10 to 15 minutes to be completed. Tests which were conducted to analyze the data were reviewed and their strengths and weakness related to the data were highlighted.

Some instruments attempt to assess the widest possible range of psychosocial issues, while others offer a greater depth of inquiry per topic. Unfortunately, it seems quite difficult to strike the optimal balance between breadth and depth of inquiry. In this respect, this instrument is based on Ware's (1984) suggestions, that routine assessment of a fairly broad, comprehensive set of psychosocial variables is often more appropriate. Therefore, there are questions

covering five different dimensions, which according to open interviews and review of the literature include the major oral impacts on daily living. It does not gather in-depth information for each category since otherwise it would be too long and therefore burdensome to participants. It is a generic measure which can be used on a wide range of populations, involving several levels and aspects of oral status. Those aspects comprise categories which were based on oral health definitions (WHO 1982; Dept of Health, 1993) and previous studies involving oral health and quality of life (Cushing, 1986; Strauss, 1988; Rosenberg, 1988; Gooch, 1989; Atchinson and Dolan, 1990; Slader and Spencer, 1992). The advantage of being a generic measure is that it allows for a comparison of results across studies and, in the long run, can facilitate an ordered stepwise process of instrument development and validation. It is no accident that such generic instruments as the Sickness Impact Profile (Bergner et al, 1981) and the Nottingham Health Profile (Hunt and McEwen, 1980), together with the McMaster Health Index Questionnaire (Chambers et al, 1987) and the Quality of Well-Being Scale (Anderson et al, 1986) have well documented psychometric properties. Their broad coverage of important psychosocial domains has led to their widespread use, which, in turn has yielded extensive data regarding their performance in a range of applied research settings. The major limitation of such generic measures is that they may not cover adequately certain topics of particular relevance for a given disease or treatment. In this particular instrument, although the most

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important psychological experience connected with oral disease is pain and/or discomfort (Nikias, 1985), it does not go deeply into considerations about pain, such as the instruments developed by Reisine (1989) and Locker and Grushka (1987) which were specifically proposed to investigate pain.

Another important issue in a measure of this type is the degree of flexibility offered in terms of aggregating or disaggregating the data. The availability of procedures to aggregate individual items into a more discrete number of scales or indexes carries with it a number of psychometric advantages.

Summative ratings can:

- a. increase the variability of scores, an important prerequisite for detecting changes in health status over time and differences among patient groups,
- b. increase score reliability by pooling information that items have in common,
- c. increase score validity, if items are selected carefully enough to provide a representative sample of information,
- d. reduce problems of missing data by providing the option, whenever responses to individual questions are missing, of estimating scores based on the remaining questions that comprise the scale.

In general, however, measures that offer only a global score without the possibility of disaggregation should be avoided. The loss of information in such cases tends to be so great as to render the results uninterpretable (Aaronson, 1988). Locker (1992) criticized two recently developed measures, which compound items into a final score, claiming that relationship of clinical variables and subjective measures results were difficult to interpret. Nevertheless,

a total score will reproduce the total impact subjects are experiencing, and since each dimension does not impact separately, it seems important to have this view of the individual as a whole. In the present study when dimensions were weighted and then summed into a final score a different result was obtained from that obtained when dimensions did not receive any weight and were simply added together into a final score. By simply summing up the dimensions one is implicitly giving equal weights to all of them. Results from this study appear to show that dimensions tend to have different weights and that those weights should be considered. This measure, besides generating the total score, generates scores for each separate dimension overcoming the restriction highlighted by both Locker (1992) and Aaronson (1988). Therefore target groups can be recognized and analyzed in further detail.

One aspect that was highlighted by this investigation is that DMFT is not a good clinical measure to study psychosocial impacts. The DMFT attributes to filled teeth a similar impact as that of decayed or missing teeth. Results in this research have shown that, except for the comfort dimension, those who were classified as being satisfied had a higher number of filled teeth and a lower number of decayed and missing teeth than those who were classified as being relatively satisfied and unsatisfied. For comfort those who were satisfied presented a lower number of filled, decayed and missing teeth than relatively satisfied and unsatisfied respondents. These results substantiate Cushing's (1991) claim that amongst those who had experienced caries, those who had

their teeth filled had better oral health than those whose DMFT is mostly accounted for by missing and decayed teeth. In this study groups were not selected according to whether they wore a prosthesis or not. Different impacts occurred in those who had missing teeth replaced. In addition, partial prosthesis and denture status were not considered as a variable to select the sample, and information on the impact different prosthesis status had on individuals could not be investigated since there was insufficient respondents in each category. Furthermore, a more detailed clinical examination involving radiographs and vitality tests was not done because they were impractical under the prevailing circumstances.

This study, confirming results from other studies, did not find a high correlation between clinical and subjective measures. One of the reasons could be because of the impracticability of having a detailed clinical examination. This could have masked clinical discomforts such as a slightly high restoration or an interproximal decay which could not be detected in a less thorough clinical examination. Other reason for these weak correlations is adding subjective impact items in which some of the items do not correspond to the clinical status analyzed. In the same vein, Cohen (1970) pointed out that social and psychological considerations do contribute to subjective impacts. For instance, it is not possible to predict which malocclusion will give rise to disability or handicap if no attention is given to social and psychological factors of acceptability of occlusion. More recently, some authors reported other mediators of subjective

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impacts. Cushing (1986) reported age and gender, Gooch (1989) and Atchinson (1990) reported level of education, race and income and Locker (1992) claimed that income is a contributor of different clinical status and subjective scores. In the present study, social class was included together with clinical variables as an explanatory variable of the subjective measure. Additionally, clinical variables varied according to subjective impact. Those who had more positive impacts had less decayed and missing teeth and those who had more negative impacts had more decayed and missing teeth without replacements. This suggests that significant clinical and social variables which were highlighted as explanatory variables of subjective measures can be used to begin to assess those who, in the population studied, experience dental problems.

#### 9.1. Future development

interesting

The results from this developmental study are encouraging. The instrument has proved acceptable to respondents, including the illiterate, and was easy and quick to administer. Future studies should be conducted in order to retest the difference between weighting dimensions and to test cultural validity. Further tests could reinforce construct validity and reliability tests. They should be conducted in studies which assess different age groups.

## 9.2. The need for subjective indicators

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The development of an indicator of subjective health is a time-consuming and risky undertaking, but it appears to be a necessary step on the path to linking quality of life to health planning and health services. Allowing individuals to evaluate their own health status solves, to some extent, the problems posed by the different definitions of health and illness proposed by professionals and redresses the balance between lay and professional 'objectives'. However because health and disease are not dichotomous, but the transition of disease to health and vice-versa is a continuum, further studies should be done to highlight that point on the continuum when health changes into disease (Sheiham, 1982). Locker (1988) in his model which moves from a biological to a behavioural and then to a social level of analysis, shows that health-disease relationships are not direct. Impairment does not necessarily lead to disability any more than disability results in disadvantage. While these outcomes are dependent upon the nature of the severity of the disorder they are also modified by social and psychological variables. Exploring the links between clinical conditions and their personal and social outcomes not only promotes a more complex appreciation of oral health but also provides the opportunity to identify interventions to minimize the consequences of oral diseases. Measures and indicators of discomfort, disability and disadvantage, associated with oral conditions, are required to document the extent to which these conditions impinge on the

quality of life of the individual and the well-being of society (Locker, 1988).

In the present study, confirming prior studies, different levels of oral status had different impacts on people's daily living and social and psychological dimensions showed to be important factors that have to be assessed to reflect people's needs. In addition, assessing the different importance people attribute to different dimensions was important, as exemplified by the fact that differences between sub-groups were highlighted by such information. In order to assess people's needs clinical indicators alone are not enough. Subjective measures which bring a more comprehensive picture of the effects of oral disorders by documenting their impact on work, leisure and emotional behaviour are needed. The instrument developed and tested in this study which attempts to assess subjective information is described in the following chapter.

## CHAPTER 10

### CONCLUSION

This study developed a socio-dental indicator of oral health which attempts to reflect people's need and assesses the different importance people attribute to different dimensions of quality of life. As distinct from other studies, this measure gives total scores for five dimensions of quality of life assessed (appearance, comfort, pain, eating restriction and performance), a total final score and assesses how various aspects affecting the of quality of life vary in their importance for different sub-groups within a population. This will reflect the different needs within a population. The subjective measure will contribute, together with clinical measures, to the assessment of an individual's need and likely demand for dental care, which are also defined by economic, social and cultural factors.

To develop this final instrument, several tests and validation of the measure were done. The instrument turned out to be slightly different from the one originally used. Some questions were excluded, items were grouped into five dimensions, instead of the original four dimensions, and the scale used to weight dimensions gained one extra dimension. In addition, a different way was suggested to introduce the scale to respondents. The following sections will describe the final instrument (questionnaire and scale), how to score items and how to group respondents according to their scores.

## 10.1. Questionnaire and scale

Before interviewing people, the questionnaire and the scale should be shown to the respondents and an explanation of the study given. Confidentiality of the information and the existence of no right or wrong answers should be stressed. The presentation of the five dimensions, questionnaire, and scale will be explained in detail in the following sub-sections.

### 10.1.1. Introducing the dimensions

Respondents should be told that questions from five different dimensions are going to be asked of them. In addition, it should also be mentioned that respondents are to be asked about the degree of importance they attribute to each dimension.

Dimensions are to be introduced by explaining each of them in turn;

Dental appearance: Consists of the appearance of the mouth,

Mouth comfort: Is related to not having complaints of discomfort and/or unpleasant status caused by any problem in the mouth (ie. bleeding gums, packing food). It should be stressed that mouth comfort is not the same as pain,

Oral pain: It should be introduced by means of its negation - not feeling pain from the teeth and mouth,

Performance: Is related to the degree to which oral status may affect the ability to carry out daily functions and interaction with people,

No eating restrictions: Is related to not having difficulties to eat, caused by poor biting and/or chewing.

After describing the dimensions, the questionnaire is introduced with an explanation that it consists of items from these five dimensions.

#### 10.1.2. Questionnaire

Respondents should be asked to answer the following questions (which comprise the five dimensions explained above).

10.1.2.1. Questionnaire for those who did not wear a prosthesis:

Questions about your teeth will be asked. There is no right or wrong answer. Feel free to ask anything you do not understand.

Questions

1. How satisfied have you been, on the whole, with your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

2. Have your teeth worried you with any problem in the last three months? (caused concern)

- always
- frequently
- sometimes
- rarely
- never

3. How satisfied have you been with the appearance of your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

4. How satisfied have you been with the colour of your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

5. How satisfied have you been with the position of your teeth (if they are crooked or not) in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

6. Some people when not satisfied with their teeth avoid showing them when they smile. Have you tried to avoid showing your teeth when smiling or laughing in the last three months?

- always avoided
- frequently avoided
- sometimes avoided
- rarely avoided
- never avoided

7. How satisfied have you been in showing your teeth when you smiled in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

8. Sometimes, when people eat, they get food stuck between their teeth. Have you had any problems with food getting stuck between your teeth in the last three months?

- always
- frequently
- sometimes
- rarely
- never

9. Sometimes people have bad breath. Have you had any bad breath caused by any problems in your mouth, during the last three months?

- always
- frequently
- sometimes
- rarely
- never

10. Have you had to change the food you eat for a long period of time (more than three months) because of anything the matter with your teeth?

- yes
- no

11. Have you had to change the way you prepare your food for a long period of time (more than three months) because of anything the matter with your teeth?

- yes
- no

12. How well have you been able to chew your food, without having any difficulties caused by your teeth in the last three months?

- very well
- well
- more or less
- badly
- very badly

13. How satisfied are you with your chewing?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

14. How well have you been able to bite your food, without having any difficulties caused by your teeth, in the last three months?

- very well
- well
- more or less
- badly
- very badly

15. How satisfied are you with your biting?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

16. Have you had any loose teeth in the last three months?

- yes
- no

17. Have you had any spontaneous toothache (toothache without any specific cause) in the last three months?

- yes
- no

18. Have you had any toothache when you ate or drank anything cold/hot or sweet in the last three months?

- yes
- no

19. Have you had to change your food since this pain began?

- always
- frequently
- sometimes
- rarely
- never

20. Have you had any pain in your jaw joint in the last three months?

- every day
- once a week
- less than once a week
- just in some movements
- none

21. How much did the appearance of your teeth affect your working capacity during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

22. If you had toothache or any jaw joint pain, how much did this pain affect your working capacity during the last three months?

- extremely
- very much
- moderately
- little
- none

23. How much did the function of your teeth (like, eating, talking) affect your working capacity during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

24. How much did the appearance of your teeth affect your contact with people (for example, going out with friends) during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

25. If you had toothache or any jaw joint pain, how much did this pain affect your contact with people (for example, going out with friends) during the last three months?

- extremely
- very much
- moderately
- little
- none

26. How much did the function of your teeth (like eating, talking) affect your contact with people (for example, going out with friends) during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

27. How much did the appearance of your teeth affect your romantic life during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

28. If you had toothache or any jaw joint pain, how much did this pain affect your romantic life during the last three months?

- extremely
- very much
- moderately
- little
- none

29. How much did the function of your teeth (like eating, talking) affect your romantic life during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

30. If you had any toothache or any jaw joint pain in the last three months, how much has this pain affected your sleep?

- extremely
- very much
- moderately
- little
- none

31. If you had any toothache or any jaw joint pain in the last three months, how much stress has this pain caused you?

- extreme
- very much
- moderate
- little
- none

32. Have your teeth helped you to feel confident during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed/ affected
- disturbed/ affected a lot

33. Have your teeth caused any embarrassment in the last three months?

- extremely
- very much
- moderately
- little
- none

34. How satisfied have you been, on the whole, with your gums in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

35. Have your gums bled in the last three months?

- yes
- no

36. Have you felt any sensitivity when you ate or drank anything cold or acidic because your gums retracted in the last three months?

- yes
- no

#### 10.1.2.2. Questionnaire for those who wear a partial prosthesis:

Questions about your teeth and your partial prosthesis will be asked. There is no right or wrong answer. Feel free to ask anything you do not understand.

##### Questions

1. How satisfied have you been, on the whole, with your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

2. How satisfied have you been, on the whole, with your partial prosthesis in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

3. Have your teeth or prosthesis worried you with any problem in the last three months? (caused concern)

- always
- frequently
- sometimes
- rarely
- never

4. How satisfied have you been with the appearance of your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

5. How satisfied have you been with the appearance of your partial prosthesis in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

6. How satisfied have you been with the colour of your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

7. How satisfied have you been with the colour of the teeth of your partial prosthesis in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

8. How satisfied have you been with the position of your teeth (if they are crooked or not) in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

9. Some people when are not satisfied with their teeth or partial prosthesis avoid showing them when they smile. Have you tried to avoid showing your teeth or prosthesis when smiling or laughing in the last three months?

- always avoided
- frequently avoided
- sometimes avoided
- rarely avoided
- never avoided

10. How satisfied have you been in showing your teeth or prosthesis when you smiled in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

11. Sometimes, when people eat, they get food stuck between their teeth or prosthesis. Have you had any problems with food getting stuck between your teeth/ prosthesis in the last three months?

- always
- frequently
- sometimes
- rarely
- never

12. Sometimes people have bad breath. Have you had any bad breath caused by any problems in your mouth, during the last three months?

- always
- frequently
- sometimes
- rarely
- never

13. Have you had to change the food you eat for a long period of time (more than three months) because of anything the matter with your teeth?

- yes
- no

14. Have you had to change the food you eat for a long period of time (more than three months) because of anything the matter with your prosthesis?

- yes
- no

15. Have you had to change the way you prepare your food for a long period of time (more than three months) because of anything the matter with your teeth or prosthesis?

- yes
- no

16. How well have you been able to chew your food, without having any difficulties caused by your teeth or prosthesis, in the last three months?

- very well
- well
- more or less
- badly
- very badly

17. How satisfied are you with your chewing?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

18. How well have you been able to bite your food, without having any difficulties caused by your teeth or prosthesis, in the last three months?

- very well
- well
- more or less
- badly
- very badly

19. How satisfied are you with your biting?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

20. Have you had any loose teeth in the last three months?

- yes
- no

21. Have you had any spontaneous toothache (you fell toothache without any specific cause) in the last three months?

- yes
- no

22. Have you had any toothache when you ate or drank anything cold/hot or sweet in the last three months?

- yes
- no

23. Have you had to change your food since this pain began?

- always
- frequently
- sometimes
- rarely
- never

24. Have you had any pain caused by your partial prosthesis in the last three months?

- yes
- no

25. Have you had to change your food since this pain began?

- always
- frequently
- sometimes
- rarely
- never

26. Have you had any pain in your jaw joint in the last three months?

- every day
- once a week
- less than once a week
- just in some movements
- none

27. How much did the appearance of your teeth or prosthesis affect your working capacity during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

28. If you had toothache or any pain caused by your prosthesis or jaw joint, how much did this pain affect your working capacity during the last three months?

- extremely
- very much
- moderately
- little
- none

29. How much did the function of your teeth or prosthesis (like eating, talking) affect your working capacity during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

30. How much did the appearance of your teeth or prosthesis affect your contact with people (for example, going out with friends) during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

31. If you had toothache or any pain caused by your prosthesis or your jaw joint, how much did this pain affect your contact with people (for example, going out with friends) during the last three months?

- extremely
- very much
- moderately
- little
- none

32. How much did the function of your teeth or prosthesis (like eating, talking) affect your contact with people (for example, going out with friends) during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

33. How much did the appearance of your teeth or prosthesis affect your romantic life during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

34. If you had toothache or any pain caused by your prosthesis or jaw joint, how much did this pain affect your romantic life during the last three months?

- extremely
- very much
- moderately
- little
- none

35. How much did the function of your teeth or prosthesis (like eating, talking) affect your romantic life during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

36. If you had any toothache or any pain caused by your prosthesis or jaw joint in the last three months, how much has this pain affected your sleep?

- extremely
- very much
- moderately
- little
- none

37. If you had any toothache or any pain caused by your prosthesis or jaw joint in the last three months, how much stress has this pain caused you?

- extreme
- very much
- moderate
- little
- none

38. Have your teeth or prosthesis helped you to feel confident during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed/ affected
- disturbed/ affected a lot

39. Have your teeth or prosthesis caused any embarrassment in the last three months?

- extreme
- very much
- moderate
- little
- none

40. How satisfied have you been, on the whole, with your gums in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

41. Have your gums bled in the last three months?

- yes
- no

42. Have you felt any sensitivity when you ate or drank anything cold or acidic because your gums retracted in the last three months?

- yes
- no

#### 10.1.2.3. Questionnaire for those who wear an upper denture

Questions about your teeth and your full upper denture will be asked. There is no right or wrong answer. Feel free to ask anything you do not understand.

##### Questions

1. How satisfied have you been, on the whole, with your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

2. How satisfied have you been, on the whole, with your denture in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

3. Have your teeth or denture worried you with problem in the last three months? (caused concern)

- always
- frequently
- sometimes
- rarely
- never

4. How satisfied have you been with the appearance of your teeth  
in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

5. How satisfied have you been with the appearance of your denture in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

6. How satisfied have you been with the colour of your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

7. How satisfied have you been with the colour of the teeth of your denture in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

8. How satisfied have you been with the position of your teeth (if they are crooked or not) in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

9. Some people when are not satisfied with their teeth or denture avoid showing them when they smile. Have you tried to avoid showing your teeth or denture when smiling or laughing in the last three months?

- always avoided
- frequently avoided
- sometimes avoided
- rarely avoided
- never avoided

10. How satisfied have you been in showing your teeth or denture when you smiled in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

11. Sometimes, when people eat, they get food stuck between their teeth or under their denture. How often have you had problems with food getting stuck between your teeth or under your denture in the last three months?

- always
- frequently
- sometimes
- rarely
- never

12. Sometimes people have bad breath. How often have you had bad breath caused by any problems in your mouth during the last three months?

- always
- frequently
- sometimes
- rarely
- never

13. Have you had the feeling of a mouth full because of your denture in the last three months?

- yes
- no

14. Does your denture change the flavour of your food?

- yes
- no

15. Has your denture changed the way you speak in the last three months?

- yes
- no

16. Have you had to change the food you eat for a long period of time (more than three months) because of anything the matter with your teeth?

- yes
- no

17. Have you had to change the food you eat for a long period of time (more than three months) because of anything the matter with your denture?

- yes
- no

18. Have you had to change the way you prepare your food for a long period of time (more than three months) because of anything the matter with your teeth or denture?

- yes
- no

19. How well have you been able to chew your food, without having any difficulties caused by your teeth or denture, in the last three months?

- very well
- well
- more or less
- badly
- very badly

20. How satisfied are you with your chewing?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

21. How well have you been able to bite your food, without having any difficulties caused by your teeth or denture, in the last three months?

- very well
- well
- more or less
- badly
- very badly

22. How satisfied are you with your biting?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

23. Have you had any loose teeth in the last three months?

- yes
- no

24. Have you had any spontaneous toothache (toothache without any specific cause) in the last three months?

- yes
- no

25. Have you had any toothache when you ate or drank anything cold/hot or sweet in the last three months?

- yes
- no

26. How often have you had to change your food since this pain began?

- always
- frequently
- sometimes
- rarely
- never

27. Have you had any pain caused by your denture in the last three months?

- yes
- no

28. Have you had to change your food since this pain began?

- always
- frequently
- sometimes
- rarely
- never

29. Have you had any pain in your jaw joint in the last three months?

- every day
- once a week
- less than once a week
- just in some movements
- none

30. How much did the appearance of your teeth or denture affect your working capacity during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

31. If you had toothache or any pain caused by your denture or jaw joint, how much did this pain affect your working capacity during the last three months?

- extremely
- very much
- moderately
- little
- none

32. How much did the function of your teeth or denture (like eating, talking) affect your working capacity during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

33. How much did the appearance of your teeth or denture affect your contact with people (for example, going out with friends) during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

34. If you had toothache or any pain caused by your denture or jaw joint, how much did this pain affect your contact with people (for example, going out with friends) during the last three months?

- extremely
- very much
- moderately
- little
- none

35. How much did the function of your teeth or denture (like eating, talking) affect your contact with people (for example, going out with friends) during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

36. How much did the appearance of your teeth or denture affect your romantic life during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

37. If you had toothache or any pain caused by your denture or jaw joint, how much did this pain affect your romantic life during the last three months?

- extremely
- very much
- moderately
- little
- none

38. How much did the function of your teeth or denture (like eating, talking) affect your romantic life during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

39. If you had any toothache or any pain caused by your denture or jaw joint in the last three months, how much has this pain affected your sleep?

- extremely
- very much
- moderately
- little
- none

40. If you had any toothache or pain caused by your denture or jaw joint in the last three months, how much stress has this pain caused you?

- extreme
- very much
- moderate
- little
- none

41. Have your teeth or denture helped you to feel confident during the last three months?

- helped a lot
- helped
- were indifferent
- disturbed/ affected
- disturbed/ affected a lot

42. Have your teeth or denture caused any embarrassment in the last three months?

- extreme
- very much
- moderate
- little
- none

43. How satisfied have you been, on the whole, with your gums in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

44. Have your gums bled in the last three months?

- yes
- no

45. Have you felt any sensitivity when you ate or drank anything cold or acidic because your gums retracted in the last three months?

- yes
- no

#### 10.1.2.4. Questionnaire for those who wear an upper denture and a partial prosthesis

Questions about your teeth, your partial prosthesis and your full upper denture will be asked. There is no right or wrong answer. Feel free to ask anything you do not understand.

##### Questions

1. How satisfied have you been, on the whole, with your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

2. How satisfied have you been, on the whole, with your partial prosthesis in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

3. How satisfied have you been, on the whole, with your denture in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

4. Have your teeth or prosthesis worried you with problem in the last three months? (caused concern)

- always
- frequently
- sometimes
- rarely
- never

5. How satisfied have you been with the appearance of your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

6. How satisfied have you been with the appearance of your partial prosthesis in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

7. How satisfied have you been with the appearance of your denture in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

8. How satisfied have you been with the colour of your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

9. How satisfied have you been with the colour of the teeth of your partial prosthesis in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

10. How satisfied have you been with the colour of the teeth of your denture in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

11. Some people when are not satisfied with their teeth or prosthesis avoid showing them when they smile. Have you tried to avoid showing your teeth or denture when smiling or laughing in the last three months?

- always avoided
- frequently avoided
- sometimes avoided
- rarely avoided
- never avoided

12. How satisfied have you been in showing your teeth or prosthesis when you smiled in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

13. Sometimes, when people eat, they get food stuck between their teeth or under their prosthesis. How often have you had problems with food getting stuck between your teeth or under your denture in the last three months?

- always
- frequently
- sometimes
- rarely
- never

14. Sometimes people have bad breath. How often have you had bad breath caused by any problems in your mouth during the last three months?

- always
- frequently
- sometimes
- rarely
- never

15. Have you had the feeling of a mouth full because of your denture in the last three months?

- yes
- no

16. Does your denture change the flavour of your food?

- yes
- no

17. Has your denture changed the way you speak in the last three months?

- yes
- no

18. Have you had to change the food you eat for a long period of time (more than three months) because of anything the matter with your teeth?

- yes
- no

19. Have you had to change the food you eat for a long period of time (more than three months) because of anything the matter with your partial prosthesis?

- yes
- no

20. Have you had to change the food you eat for a long period of time (more than three months) because of anything the matter with your denture?

- yes
- no

21. Have you had to change the way you prepare your food for a long period of time (more than three months) because of anything the matter with your teeth or prosthesis?

- yes
- no

22. How well have you been able to chew your food, without having any difficulties caused by your teeth or prosthesis, in the last three months?

- very well
- well
- more or less
- badly
- very badly

23. How satisfied are you with your chewing?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

24. How well have you been able to bite your food, without having any difficulties caused by your teeth or prosthesis, in the last three months?

- very well
- well
- more or less
- badly
- very badly

25. How satisfied are you with your biting?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

26. Have you had any loose teeth in the last three months?

- yes
- no

27. Have you had any spontaneous toothache (toothache without any specific cause) in the last three months?

- yes
- no

28. Have you had any toothache when you ate or drank anything cold/hot or sweet in the last three months?

- yes
- no

29. How often have you had to change your food since this pain began?

- always
- frequently
- sometimes
- rarely
- never

30. Have you had any pain caused by your partial prosthesis in the last three months?

- yes
- no

31. Have you had any pain caused by your denture in the last three months?

- yes
- no

32. Have you had to change your food since this pain began?

- always
- frequently
- sometimes
- rarely
- never

33. Have you had any pain in your jaw joint in the last three months?

- every day
- once a week
- less than once a week
- just in some movements
- none

34. How much did the appearance of your teeth or prosthesis affect your working capacity during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

35. If you had toothache or any pain caused by your prosthesis or jaw joint, how much did this pain affect your working capacity during the last three months?

- extremely
- very much
- moderately
- little
- none

36. How much did the function of your teeth or prosthesis (like eating, talking) affect your working capacity during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

37. How much did the appearance of your teeth or prosthesis affect your contact with people (for example, going out with friends) during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

38. If you had toothache or any pain caused by your prosthesis or jaw joint, how much did this pain affect your contact with people (for example, going out with friends) during the last three months?

- extremely
- very much
- moderately
- little
- none

39. How much did the function of your teeth or prosthesis (like eating, talking) affect your contact with people (for example, going out with friends) during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

40. How much did the appearance of your teeth or prosthesis affect your romantic life during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

41. If you had toothache or any pain caused by your prosthesis or jaw joint, how much did this pain affect your romantic life during the last three months?

- extremely
- very much
- moderately
- little
- none

42. How much did the function of your teeth or prosthesis (like eating, talking) affect your romantic life during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

43. If you had any toothache or any pain caused by your prosthesis or jaw joint in the last three months, how much has this pain affected your sleep?

- extremely
- very much
- moderately
- little
- none

44. If you had any toothache or pain caused by your prosthesis or jaw joint in the last three months, how much stress has this pain caused you?

- extreme
- very much
- moderate
- little
- none

45. Have your teeth or prosthesis helped you to feel confident during the last three months?

- helped a lot
- helped
- were indifferent
- disturbed/ affected
- disturbed/ affected a lot

46. Have your teeth or prosthesis caused any embarrassment in the last three months?

- extreme
- very much
- moderate
- little
- none

47. How satisfied have you been, on the whole, with your gums in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

48. Have your gums bled in the last three months?

- yes
- no

49. Have you felt any sensitivity when you ate or drank anything cold or acidic because your gums retracted in the last three months?

- yes
- no

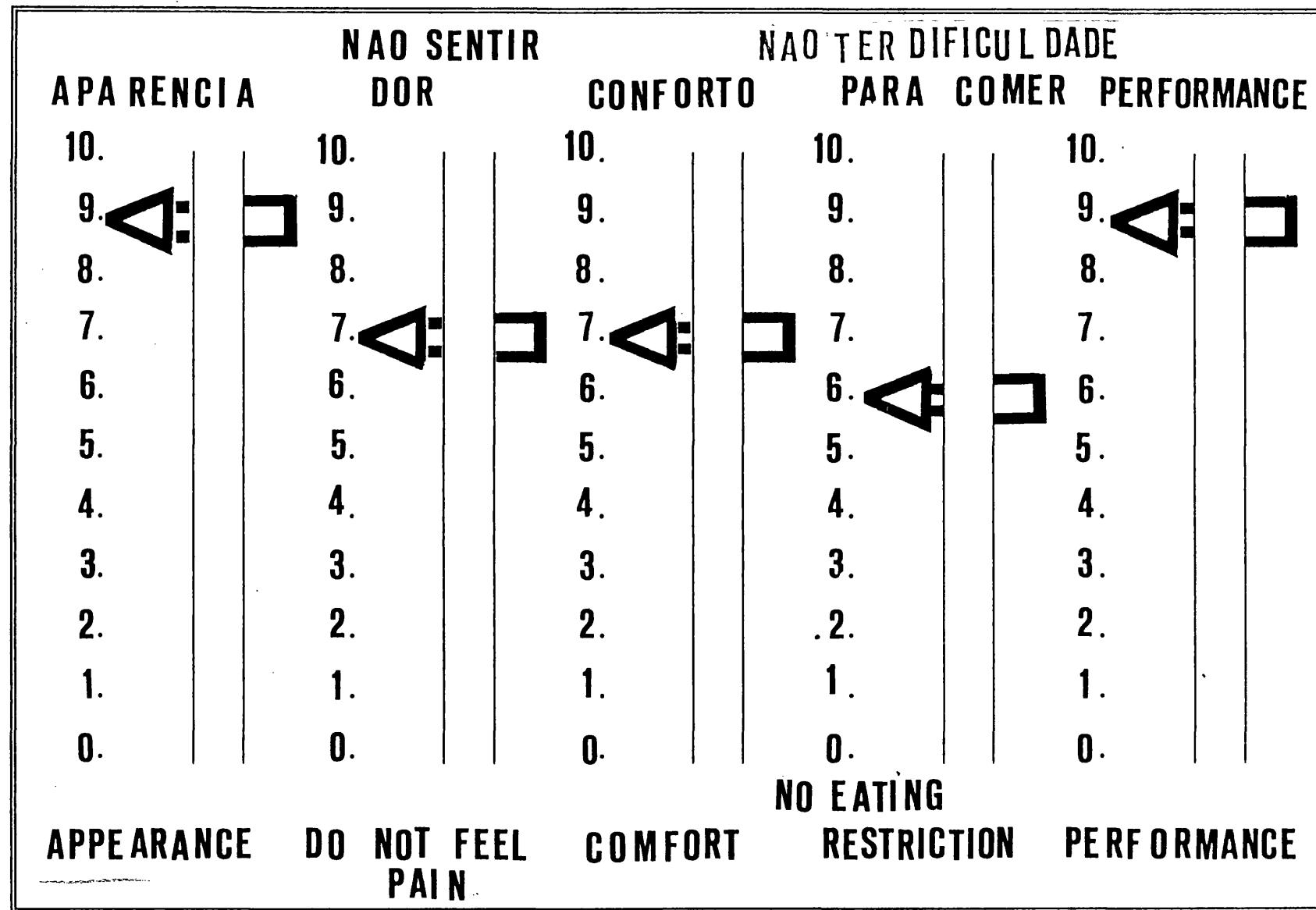
#### 10.1.3. Scale

After administering the questionnaire the scale should then be introduced. Dimensions should be once again explained and respondents asked to record on the scale the relative importance they attribute to each dimension (in relation to the others).

There are five scales, one for each dimension. All the scales range from 0 to 10 (0 being the lowest value, meaning totally unimportant and 10 being the highest value, meaning extremely important). One should then ask the questions 'Would you please mark, using the arrows and changing their position as much as you like, how important each dimension is to you in comparison with the others?' It should be explained that dimensions could be marked more important, equally important or less important than others. It should also be suggested that 'You can start marking the dimension/s that is/are more important. After that, mark the values for the dimensions which are less important. You can change marking as much as you want' (Table 10.1.3.1).

Illiterate people, should be helped by being asked, while always repeating what the five dimensions are, if any of the five dimensions are more important to him/her than the others; or if any subset of dimensions is equally important. In the process they should be asked to attribute values to dimensions by sliding the arrows.

Table 10.1.3.1. Model of the scale used to obtain the weight  
respondents attributed to dimensions.



## 10.2. Scoring items and dimensions

Scores for items are obtained from the questionnaire and weights for dimensions are obtained from the scale. Firstly, questionnaire items are scored and added together into dimensions scores. Secondly, dimension weights are calculated from respondents marking on the scale. Thirdly, dimension scores are multiplied by the respective dimension weights and added together into a final score. The following section will explain this process in detail.

### 10.2.1. Score for questionnaire items

The scoring consists of '+1', for positive impacts, '0' for fair impacts and '-1' for negative impacts. The complete spectrum of possible answers is presented below with their associated scores (Table 10.2.1.1).

Table.10.2.1.1. Sample of questionnaire questions containing the various alternatives used for scoring answers.

Questions and options	Scores
Are you satisfied with your teeth?	
. very satisfied	+1
. satisfied	+1
. more or less	0
. unsatisfied	-1
. very unsatisfied	-1
Do you avoid smiling due to any problem with your teeth?	
. always	-1
. frequently	-1
. sometimes	0
. rarely	0
. never	+1
Do you have tooth ache when you eat or drink anything cold or hot?	
. yes	-1
. no	+1
If yes, did this pain disturb you?	
. extremely	-1
. very much	-1
. moderately	0
. little	0
. not at all	+1
How is your chewing?	
. very well	+1
. well	+1
. more or less	0
. badly	-1
. very badly	-1
Do you feel pain in your jaw joint?	
. every day	-1
. once a week	-1
. less than once a week	0
. just in some movements	0
. none	+1
How does the appearance of your teeth help your work?	
. helps a lot	+1
. helps	+1
. indifferent	+1
. disturbs	-1
. disturbs a lot	-1

After scoring items, the scores for items which compose a given dimension should be added together and then divided by the number of items for the dimension. The result gives a score for the dimension. Those scores can be any real number from '-1' to '+1'. For a final score, dimension weights should first be computed from respondents' markings on the scales.

#### 10.2.2. Scale scores

For each respondent, scale marks given for each of the five dimensions should be added together (denote the value of the resulting sum 'total scale value'). Then divide each of these five scale marking by their 'total scale value'. The result of this division for each dimension, gives the corresponding dimension weight.

total score value = appearance mark+ performance mark+ comfort mark+ pain mark+ eating restriction mark.

weight for dimension = dimension mark/ total scale value.

Dimension scores obtained from the questionnaire should then be, multiplied by their respective dimension weights (denote the result 'weighted dimension scores'). A final score, for each respondent, is obtained by adding together his/her weighted dimension scores. Final score are real numbers ranging from/ '-1' to '+1' .

### 10.3. Grouping respondents

In the absence of established population norms, respondents should be grouped into satisfied (score ranging from .7 to 1), relatively satisfied (score ranging from .69 to 0) and unsatisfied (score below 0). Since final scores are real numbers ranging from '-1' to '+1' , this grouping can vary according to the information needs of the population in each study. The same applies to the score of each dimension which is a real number ranging from '-1' to '+1'.

According to the type of study being carried out, one can analyse both scores for each dimension and the total final score, or simply analyse the final score.

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## APPENDIX 1

### QUESTIONNAIRE

A questionnaire was developed to assess subjective data on quality of life impacts caused by oral status. A basic questionnaire composed of 49 items was used to interview respondents who did not wear a prosthesis. Extra questions were added to this basic questionnaire for those who wore a partial prosthesis and for those who wore a full denture. Two versions, one in Portuguese and another in English, of the basic questionnaire and the questionnaires used for those who wore a partial prosthesis and a full denture are presented.

### 1.1. Basic questionnaire (English version)

Questions about your teeth will be asked. There is no right or wrong answer. Feel free to ask anything you do not understand.

#### Questions

1. How satisfied have you been, on the whole, with your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

2. Have your teeth worried you with any problem in the last three months? (caused concern)

- always
- frequently
- sometimes
- rarely
- never

3. How satisfied have you been with the appearance of your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

4. How satisfied have you been with the colour of your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

5. How satisfied have you been with the position of your teeth (if they are crooked or not) in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

6. Some people when not satisfied with their teeth avoid showing them when they talk. Have you tried to avoid showing your teeth when talking during the last three months?

- always avoided
- frequently avoided
- sometimes avoided
- rarely avoided
- never avoided

7. How satisfied have you been in showing your teeth when you talked in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

8. Some people when not satisfied with their teeth avoid showing them when they smile. Have you tried to avoid showing your teeth when smiling or laughing in the last three months?

- always avoided
- frequently avoided
- sometimes avoided
- rarely avoided
- never avoided

9. How satisfied have you been in showing your teeth when you smiled in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

10. Sometimes, when people eat, they get food stuck between their teeth. Have you had any problems with food getting stuck between your teeth in the last three months?

- always
- frequently
- sometimes
- rarely
- never

11. If you did, how much discomfort have you had from this food getting stuck between your teeth ?

- extreme
- very much
- moderate
- little
- none

12. Sometimes people have bad breath. Have you had any bad breath caused by any problems in your mouth, during the last three months?

- always
- frequently
- sometimes
- rarely
- never

13. If you did, how much discomfort did this bad breath cause you?

- extreme
- very much
- moderate
- little
- none

14. Have you had to change the food you eat for a long period of time (more than three months) because of anything the matter with your teeth?

- yes
- no

15. If you did, how much displeasure did you have because of having to change your food?

- extreme
- very much
- moderate
- little
- none

16. Have you had to change the way you prepare your food for a long period of time (more than three months) because of anything the matter with your teeth?

- yes
- no

17. If you did, how much displeasure did you have because of having to change the way you prepared your food?

- extreme
- very much
- moderate
- little
- none

18. How well have you been able to chew your food, without having any difficulties caused by your teeth in the last three months?

- very well
- well
- more or less
- badly
- very badly

19. How satisfied are you with your chewing?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

20. How well have you been able to bite your food, without having any difficulties caused by your teeth, in the last three months?

- very well
- well
- more or less
- badly
- very badly

21. How satisfied are you with your biting?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

22. Have you had any loose teeth in the last three months?

- yes
- no

23. If you did, how much discomfort did this loose tooth cause you?

- extreme
- very much
- moderate
- little
- none

24. Have you had any spontaneous toothache (toothache without any specific cause) in the last three months?

- yes
- no

25. If you did, how much discomfort have you had because of this pain?

- extreme
- very much
- moderate
- little
- none

26. Have you had any toothache when you ate or drank anything cold/hot or sweet in the last three months?

- yes
- no

27. If you did, how much of discomfort have you had because of this pain?

- extreme
- very much
- moderate
- little
- none

28. Have you had to change your food since this pain began?

- always
- frequently
- sometimes
- rarely
- never

29. If you did, how much displeasure have you had because of this changing of food?

- extreme
- very much
- moderate
- little
- none

30. Have you had any pain in your jaw joint in the last three months?

- every day
- once a week
- less than once a week
- just in some movements
- none

31. If you did, how much discomfort have you had because of this pain?

- extreme
- very much
- moderate
- little
- none

32. How much did the appearance of your teeth affect your working capacity during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

33. If you had toothache or any jaw joint pain, how much did this pain affect your working capacity during the last three months?

- extremely
- very much
- moderately
- little
- none

34. How much did the function of your teeth (like, eating, talking) affect your working capacity during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

35. How much did the appearance of your teeth affect your contact with people (for example, going out with friends) during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

36. If you had toothache or any jaw joint pain, how much did this pain affect your contact with people (for example, going out with friends) during the last three months?

- extremely
- very much
- moderately
- little
- none

37. How much did the function of your teeth (like eating, talking) affect your contact with people (for example, going out with friends) during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

38. How much did the appearance of your teeth affect your romantic life during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

39. If you had toothache or any jaw joint pain, how much did this pain affect your romantic life during the last three months?

- extremely
- very much
- moderately
- little
- none

40. How much did the function of your teeth (like eating, talking) affect your romantic life during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

41. If you had any toothache or any jaw joint pain in the last three months, how much has this pain affected your sleep?

- extremely
- very much
- moderately
- little
- none

42. If you had any toothache or any jaw joint pain in the last three months, how much stress has this pain caused you?

- extreme
- very much
- moderate
- little
- none

43. Have your teeth helped you to feel confident during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed/ affected
- disturbed/ affected a lot

44. Have your teeth caused any embarrassment in the last three months?

- extremely
- very much
- moderately
- little
- none

45. How satisfied have you been, on the whole, with your gums in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

46. Have your gums bled in the last three months?

- yes
- no

47. If yes, how much discomfort did you have because of this bleeding?

- extreme
- very much
- moderate
- little
- none

48. Have you felt any sensitivity when you ate or drank anything cold or acidic because your gums retracted in the last three months?

- yes
- no

49. If you did, how much discomfort did you have when you ate or drank anything cold or acidic because of this sensitivity?

- extreme
- very much
- moderate
- little
- none

## 1.2. Questionnaire for those who wear a partial prosthesis (English version)

Questions about your teeth and your partial prosthesis will be asked. There is no right or wrong answer. Feel free to ask anything you do not understand.

### Questions

1. How satisfied have you been, on the whole, with your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

2. How satisfied have you been, on the whole, with your partial prosthesis in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

3. Have your teeth or prosthesis worried you with any problem in the last three months? (caused concern)

- always
- frequently
- sometimes
- rarely
- never

4. How satisfied have you been with the appearance of your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

5. How satisfied have you been with the appearance of your partial prosthesis in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

6. How satisfied have you been with the colour of your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

7. How satisfied have you been with the colour of the teeth of your partial prosthesis in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

8. How satisfied have you been with the position of your teeth (if they are crooked or not) in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

9. Some people when are not satisfied with their teeth or partial prosthesis avoid showing them when they talk. Have you tried to avoid showing your teeth or prosthesis when talking during the last three months?

- always avoided
- frequently avoided
- sometimes avoided
- rarely avoided
- never avoided

10. How satisfied have you been in showing your teeth or partial prosthesis when you talked in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

11. Some people when are not satisfied with their teeth or partial prosthesis avoid showing them when they smile. Have you tried to avoid showing your teeth or prosthesis when smiling or laughing in the last three months?

- always avoided
- frequently avoided
- sometimes avoided
- rarely avoided
- never avoided

12. How satisfied have you been in showing your teeth or prosthesis when you smiled in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

13. Sometimes, when people eat, they get food stuck between their teeth or prosthesis. Have you had any problems with food getting stuck between your teeth/ prosthesis in the last three months?

- always
- frequently
- sometimes
- rarely
- never

14. If you did, how much of discomfort have you had from this food getting stuck between your teeth/ prosthesis?

- extreme
- very much
- moderate
- little
- none

15. Sometimes people have bad breath. Have you had any bad breath caused by any problems in your mouth, during the last three months?

- always
- frequently
- sometimes
- rarely
- never

16. If you did, how much discomfort did this bad breath cause to you?

- extreme
- very much
- moderate
- little
- none

17. Have you had to change the food you eat for a long period of time (more than three months) because of anything the matter with your teeth?

- yes
- no

18. Have you had to change the food you eat for a long period of time (more than three months) because of anything the matter with your prosthesis?

- yes
- no

19. If you did, how much displeasure did you have because of having to change your food?

- extreme
- very much
- moderate
- little
- none

20. Have you had to change the way you prepare your food for a long period of time (more than three months) because of anything the matter with your teeth or prosthesis?

- yes
- no

21. If you did, how much displeasure did you have because of having to change the way you prepared your food?

- extreme
- very much
- moderate
- little
- none

22. How well have you been able to chew your food, without having any difficulties caused by your teeth or prosthesis, in the last three months?

- very well
- well
- more or less
- badly
- very badly

23. How satisfied are you with your chewing?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

24. How well have you been able to bite your food, without having any difficulties caused by your teeth or prosthesis, in the last three months?

- very well
- well
- more or less
- badly
- very badly

25. How satisfied are you with your biting?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

26. Have you had any loose teeth in the last three months?

- yes
- no

27. If you did, how much discomfort did the loose tooth cause you?

- extreme
- very much
- moderate
- little
- none

28. Have you had any spontaneous toothache (you fell toothache without any specific cause) in the last three months?

- yes
- no

29. If you did, how much discomfort have you had because of this pain?

- extreme
- very much
- moderate
- little
- none

30. Have you had any toothache when you ate or drank anything cold/hot or sweet in the last three months?

- yes
- no

31. If you did, how much discomfort have you had because of this pain?

- extreme
- very much
- moderate
- little
- none

32. Have you had to change your food since this pain began?

- always
- frequently
- sometimes
- rarely
- never

33. Have you had any pain caused by your partial prosthesis in the last three months?

- yes
- no

34. If you did, how much discomfort have you had because of this pain?

- extreme
- very much
- moderate
- little
- none

35. Have you had to change your food since this pain began?

- always
- frequently
- sometimes
- rarely
- never

36. If you did, how much displeasure have you had because of this changing of food?

- extreme
- very much
- moderate
- little
- none

37. Have you had any pain in your jaw joint in the last three months?

- every day
- once a week
- less than once a week
- just in some movements
- none

38. If you did, how much discomfort have you had because of this pain?

- extreme
- very much
- moderate
- little
- none

39. How much did the appearance of your teeth or prosthesis affect your working capacity during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

40. If you had toothache or any pain caused by your prosthesis or jaw joint, how much did this pain affect your working capacity during the last three months?

- extremely
- very much
- moderately
- little
- none

41. How much did the function of your teeth or prosthesis (like eating, talking) affect your working capacity during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

42. How much did the appearance of your teeth or prosthesis affect your contact with people (for example, going out with friends) during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

43. If you had toothache or any pain caused by your prosthesis or your jaw joint, how much did this pain affect your contact with people (for example, going out with friends) during the last three months?

- extremely
- very much
- moderately
- little
- none

44. How much did the function of your teeth or prosthesis (like eating, talking) affect your contact with people (for example, going out with friends) during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

45. How much did the appearance of your teeth or prosthesis affect your romantic life during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

46. If you had toothache or any pain caused by your prosthesis or jaw joint, how much did this pain affect your romantic life during the last three months?

- extremely
- very much
- moderately
- little
- none

47. How much did the function of your teeth or prosthesis (like eating, talking) affect your romantic life during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

48. If you had any toothache or any pain caused by your prosthesis or jaw joint in the last three months, how much has this pain affected your sleep?

- extremely
- very much
- moderately
- little
- none

49. If you had any toothache or any pain caused by your prosthesis or jaw joint in the last three months, how much stress has this pain caused you?

- extreme
- very much
- moderate
- little
- none

50. Have your teeth or prosthesis helped you to feel confident during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed/ affected
- disturbed/ affected a lot

51. Have your teeth or prosthesis caused any embarrassment in the last three months?

- extreme
- very much
- moderate
- little
- none

52. How satisfied have you been, on the whole, with your gums in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

53. Have your gums bled in the last three months?

- yes
- no

54. If yes, how much of discomfort did you have because of this bleeding?

- extreme
- very much
- moderate
- little
- none

55. Have you felt any sensitivity when you ate or drank anything cold or acidic because your gums retracted in the last three months?

- yes
- no

56. If you did, how much discomfort have you had when you ate or drank anything cold or acidic because of this sensitivity?

- extreme
- very much
- moderate
- little
- none

Questionnaire for those who wear an upper denture  
(English version)

Questions about your teeth and your partial prosthesis will be asked. There is no right or wrong answer. Feel free to ask anything you do not understand.

Questions

1. How satisfied have you been, on the whole, with your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

2. How satisfied have you been, on the whole, with your denture in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

3. Have your teeth or denture worried you with problem in the last three months? (caused concern)

- always
- frequently
- sometimes
- rarely
- never

4. How satisfied have you been with the appearance of your teeth  
in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

5. How satisfied have you been with the appearance of your denture in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

6. How satisfied have you been with the colour of your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

7. How satisfied have you been with the colour of the teeth of your denture in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

8. How satisfied have you been with the position of your teeth (if they are crooked or not) in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

9. Some people when are not satisfied with their teeth or denture avoid showing them when they talk. Have you tried to avoid showing your teeth or denture when talking during the last three months?

- always avoided
- frequently avoided
- sometimes avoided
- rarely avoided
- never avoided

10. How satisfied have you been in showing your teeth or denture when you talked in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

11. Some people when are not satisfied with their teeth or denture avoid showing them when they smile. Have you tried to avoid showing your teeth or denture when smiling or laughing in the last three months?

- always avoided
- frequently avoided
- sometimes avoided
- rarely avoided
- never avoided

12. How satisfied have you been in showing your teeth or denture when you smiled in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

13. Sometimes, when people eat, they get food stuck between their teeth or under their denture. How often have you had problems with food getting stuck between your teeth or under your denture in the last three months?

- always
- frequently
- sometimes
- rarely
- never

14. If you did, how much discomfort have you had from this food getting stuck between your teeth or under your denture?

- extreme
- very much
- moderate
- little
- none

15. Sometimes people have bad breath. How often have you had bad breath caused by any problems in your mouth during the last three months?

- always
- frequently
- sometimes
- rarely
- never

16. If you did, how much discomfort did this bad breath cause to you?

- extreme
- very much
- moderate
- little
- none

17. Have you had the feeling of a mouth full because of your denture in the last three months?

- yes
- no

18. If you did, how much discomfort has this feeling caused you?

- extreme
- very much
- moderate
- little
- none

19. Does your denture change the flavour of your food?

- yes
- no

20. If it does, how much displeasure do you have because of this changing of flavour?

- extreme
- very much
- moderate
- little
- none

21. Has your denture changed the way you speak in the last three months?

- yes
- no

22. If it did, how much displeasure did it cause to you?

- extreme
- very much
- moderate
- little
- none

23. Have you had to change the food you eat for a long period of time (more than three months) because of anything the matter with your teeth?

- yes
- no

24. Have you had to change the food you eat for a long period of time (more than three months) because of anything the matter with your denture?

- yes
- no

25. If you did, how much displeasure did you have because of having to change your food?

- extreme
- very much
- moderate
- little
- none

26. Have you had to change the way you prepare your food for a long period of time (more than three months) because of anything the matter with your teeth or denture?

- yes
- no

27. If you did, how much displeasure did you have because of having to change the way you prepared your food?

- extreme
- very much
- moderate
- little
- none

28. How well have you been able to chew your food, without having any difficulties caused by your teeth or denture, in the last three months?

- very well
- well
- more or less
- badly
- very badly

29. How satisfied are you with your chewing?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

30. How well have you been able to bite your food, without having any difficulties caused by your teeth or denture, in the last three months?

- very well
- well
- more or less
- badly
- very badly

31. How satisfied are you with your biting?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

32. Have you had any loose teeth in the last three months?

- yes
- no

33. If you did, how much of discomfort did this loose tooth cause you?

- extreme
- very much
- moderate
- little
- none

34. Have you had any spontaneous toothache (toothache without any specific cause) in the last three months?

- yes
- no

35. If you did, how much discomfort have you had because of this pain?

- extreme
- very much
- moderate
- little
- none

36. Have you had any toothache when you ate or drank anything cold/hot or sweet in the last three months?

- yes
- no

37. If you did, how much discomfort have you had because of this pain?

- extreme
- very much
- moderate
- little
- none

38. How often have you had to change your food since this pain began?

- always
- frequently
- sometimes
- rarely
- never

39. Have you had any pain caused by your denture in the last three months?

- yes
- no

40. If you did, how much discomfort have you had because of this pain?

- extreme
- very much
- moderate
- little
- none

41. Have you had to change your food since this pain began?

- always
- frequently
- sometimes
- rarely
- never

42. If you did, how much displeasure have you had because of this changing of food?

- extreme
- very much
- moderate
- little
- none

43. Have you had any pain in your jaw joint in the last three months?

- every day
- once a week
- less than once a week
- just in some movements
- none

44. If you did, how much discomfort have you had because of this pain?

- extreme
- very much
- moderate
- little
- none

45. How much did the appearance of your teeth or denture affect your working capacity during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

46. If you had toothache or any pain caused by your denture or jaw joint, how much did this pain affect your working capacity during the last three months?

- extremely
- very much
- moderately
- little
- none

47. How much did the function of your teeth or denture (like eating, talking) affect your working capacity during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

48. How much did the appearance of your teeth or denture affect your contact with people (for example, going out with friends) during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

49. If you had toothache or any pain caused by your denture or jaw joint, how much did this pain affect your contact with people (for example, going out with friends) during the last three months?

- extremely
- very much
- moderately
- little
- none

50. How much did the function of your teeth or denture (like eating, talking) affect your contact with people (for example, going out with friends) during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

51. How much did the appearance of your teeth or denture affect your romantic life during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

52. If you had toothache or any pain caused by your denture or jaw joint, how much did this pain affect your romantic life during the last three months?

- extremely
- very much
- moderately
- little
- none

53. How much did the function of your teeth or denture (like eating, talking) affect your romantic life during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

54. If you had any toothache or any pain caused by your denture or jaw joint in the last three months, how much has this pain affected your sleep?

- extremely
- very much
- moderately
- little
- none

55. If you had any toothache or pain caused by your denture or jaw joint in the last three months, how much stress has this pain caused you?

- extreme
- very much
- moderate
- little
- none

56. Have your teeth or denture helped you to feel confident during the last three months?

- helped a lot
- helped
- were indifferent
- disturbed/ affected
- disturbed/ affected a lot

57. Have your teeth or denture caused any embarrassment in the last three months?

- extreme
- very much
- moderate
- little
- none

58. How satisfied have you been, on the whole, with your gums in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

59. Have your gums bled in the last three months?

- yes
- no

60. If yes, how much discomfort have you had because of this bleeding?

- extreme
- very much
- moderate
- little
- none

61. Have you felt any sensitivity when you ate or drank anything cold or acidic because your gums retracted in the last three months?

- yes
- no

62. If you did, how much discomfort you had when you ate or drank anything cold or acidic because of this sensitivity?

- extreme
- very much
- moderate
- little
- none

Questionnaire for those who wear an upper denture and a partial prosthesis (English version)

Questions about your teeth, your partial prosthesis and your full upper denture will be asked. There is no right or wrong answer. Feel free to ask anything you do not understand.

Questions

1. How satisfied have you been, on the whole, with your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

2. How satisfied have you been, on the whole, with your partial prosthesis in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

3. How satisfied have you been, on the whole, with your denture in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

4. Have your teeth or prosthesis worried you with problem in the last three months? (caused concern)

- always
- frequently
- sometimes
- rarely
- never

5. How satisfied have you been with the appearance of your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

6. How satisfied have you been with the appearance of your partial prosthesis in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

7. How satisfied have you been with the appearance of your denture in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

8. How satisfied have you been with the colour of your teeth in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

9. How satisfied have you been with the colour of the teeth of your partial prosthesis in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

10. How satisfied have you been with the colour of the teeth of your denture in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

11. Some people when are not satisfied with their teeth or prosthesis avoid showing them when they talk. Have you tried to avoid showing your teeth or denture when talking during the last three months?

- always avoided
- frequently avoided
- sometimes avoided
- rarely avoided
- never avoided

12. How satisfied have you been in showing your teeth or prosthesis when you talked in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

13. Some people when are not satisfied with their teeth or prosthesis avoid showing them when they smile. Have you tried to avoid showing your teeth or denture when smiling or laughing in the last three months?

- always avoided
- frequently avoided
- sometimes avoided
- rarely avoided
- never avoided

14. How satisfied have you been in showing your teeth or prosthesis when you smiled in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

15. Sometimes, when people eat, they get food stuck between their teeth or under their prosthesis. How often have you had problems with food getting stuck between your teeth or under your prosthesis in the last three months?

- always
- frequently
- sometimes
- rarely
- never

16. If you did, how much discomfort have you had from this food getting stuck between your teeth or under your prosthesis?

- extreme
- very much
- moderate
- little
- none

17. Sometimes people have bad breath. How often have you had bad breath caused by any problems in your mouth during the last three months?

- always
- frequently
- sometimes
- rarely
- never

18. If you did, how much discomfort did this bad breath cause to you?

- extreme
- very much
- moderate
- little
- none

19. Have you had the feeling of a mouth full because of your denture in the last three months?

- yes
- no

20. If you did, how much discomfort has this feeling caused you?

- extreme
- very much
- moderate
- little
- none

21. Does your denture change the flavour of your food?

- yes
- no

22. If it does, how much displeasure do you have because of this changing of flavour?

- extreme
- very much
- moderate
- little
- none

23. Has your denture changed the way you speak in the last three months?

- yes
- no

24. If it did, how much displeasure did it cause to you?

- extreme
- very much
- moderate
- little
- none

25. Have you had to change the food you eat for a long period of time (more than three months) because of anything the matter with your teeth?

- yes
- no

26. Have you had to change the food you eat for a long period of time (more than three months) because of anything the matter with your partial prosthesis?

- yes
- no

27. Have you had to change the food you eat for a long period of time (more than three months) because of anything the matter with your denture?

- yes
- no

28. If you did, how much displeasure did you have because of having to change your food?

- extreme
- very much
- moderate
- little
- none

29. Have you had to change the way you prepare your food for a long period of time (more than three months) because of anything the matter with your teeth or prosthesis?

- yes
- no

30. If you did, how much displeasure did you have because of having to change the way you prepared your food?

- extreme
- very much
- moderate
- little
- none

31. How well have you been able to chew your food, without having any difficulties caused by your teeth or prosthesis, in the last three months?

- very well
- well
- more or less
- badly
- very badly

32. How satisfied are you with your chewing?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

33. How well have you been able to bite your food, without having any difficulties caused by your teeth or prosthesis, in the last three months?

- very well
- well
- more or less
- badly
- very badly

34. How satisfied are you with your biting?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

35. Have you had any loose teeth in the last three months?

- yes
- no

36. If you did, how much of discomfort did this loose tooth cause you?

- extreme
- very much
- moderate
- little
- none

37. Have you had any spontaneous toothache (toothache without any specific cause) in the last three months?

- yes
- no

38. If you did, how much discomfort have you had because of this pain?

- extreme
- very much
- moderate
- little
- none

39. Have you had any toothache when you ate or drank anything cold/hot or sweet in the last three months?

- yes
- no

40. If you did, how much discomfort have you had because of this pain?

- extreme
- very much
- moderate
- little
- none

41. How often have you had to change your food since this pain began?

- always
- frequently
- sometimes
- rarely
- never

42. Have you had any pain caused by your partial prosthesis in the last three months?

- yes
- no

43. If you did, how much discomfort have you had because of this pain?

- extreme
- very much
- moderate
- little
- none

44. Have you had any pain caused by your denture in the last three months?

- yes
- no

45. If you did, how much discomfort have you had because of this pain?

- extreme
- very much
- moderate
- little
- none

46. Have you had to change your food since this pain began?

- always
- frequently
- sometimes
- rarely
- never

47. If you did, how much displeasure have you had because of this changing of food?

- extreme
- very much
- moderate
- little
- none

48. Have you had any pain in your jaw joint in the last three months?

- every day
- once a week
- less than once a week
- just in some movements
- none

49. If you did, how much discomfort have you had because of this pain?

- extreme
- very much
- moderate
- little
- none

50. How much did the appearance of your teeth or prosthesis affect your working capacity during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

51. If you had toothache or any pain caused by your prosthesis or jaw joint, how much did this pain affect your working capacity during the last three months?

- extremely
- very much
- moderately
- little
- none

52. How much did the function of your teeth or prosthesis (like eating, talking) affect your working capacity during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

53. How much did the appearance of your teeth or prosthesis affect your contact with people (for example, going out with friends) during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

54. If you had toothache or any pain caused by your prosthesis or jaw joint, how much did this pain affect your contact with people (for example, going out with friends) during the last three months?

- extremely
- very much
- moderately
- little
- none

55. How much did the function of your teeth or prosthesis (like eating, talking) affect your contact with people (for example, going out with friends) during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

56. How much did the appearance of your teeth or prosthesis affect your romantic life during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

57. If you had toothache or any pain caused by your prosthesis or jaw joint, how much did this pain affect your romantic life during the last three months?

- extremely
- very much
- moderately
- little
- none

58. How much did the function of your teeth or prosthesis (like eating, talking) affect your romantic life during the last three months?

- helped a lot
- helped
- was indifferent
- disturbed
- disturbed a lot

59. If you had any toothache or any pain caused by your prosthesis or jaw joint in the last three months, how much has this pain affected your sleep?

- extremely
- very much
- moderately
- little
- none

60. If you had any toothache or pain caused by your prosthesis or jaw joint in the last three months, how much stress has this pain caused you?

- extreme
- very much
- moderate
- little
- none

61. Have your teeth or prosthesis helped you to feel confident during the last three months?

- helped a lot
- helped
- were indifferent
- disturbed/ affected
- disturbed/ affected a lot

62. Have your teeth or prosthesis caused any embarrassment in the last three months?

- extreme
- very much
- moderate
- little
- none

63. How satisfied have you been, on the whole, with your gums in the last three months?

- very satisfied
- satisfied
- more or less
- unsatisfied
- very unsatisfied

64. Have your gums bled in the last three months?

- yes
- no

65. If yes, how much discomfort have you had because of this bleeding?

- extreme
- very much
- moderate
- little
- none

66. Have you felt any sensitivity when you ate or drank anything cold or acidic because your gums retracted in the last three months?

- yes
- no

67. If you did, how much discomfort you had when you ate or drank anything cold or acidic because of this sensitivity?

- extreme
- very much
- moderate
- little
- none

## Questionario basico (Portuguese version)

Perguntas sobre os seus dentes serao feitas. Nao ha resposta certa ou errada. Sinta-se a vontade para perguntar qualquer duvida.

### Questoes

1. Voce tem estado satisfeito, no geral, com os seus dentes nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

2. Os seus dentes lhe causaram alguma preocupacao devido a algum problema, nos ultimos tres meses?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

3. Voce tem estado satisfeito com a aparencia dos seus dentes nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

4. Voce tem estado satisfeito com a cor dos seus dentes nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

5. Voce tem estado satisfeito com a posicao dos seus dentes (se sao trepados ou nao) nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

6. Algumas pessoas que nao se sentem satisfeitas com seus dentes quando conversam, evitam mostra-los muito. Voce tem evitado, nos ultimos tres meses, mostrar seus dentes quando conversa?

- sempre evitou
- frequentemente evitou
- as vezes evitou
- raramente evitou
- nunca evitou

7. Voce se sente satisfeito em mostrar seus dentes quando conversa?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

8. E quando voce sorriu, voce evitou mostrar seus dentes nestes ultimos tres meses?

- sempre evitou
- frequentemente evitou
- as vezes evitou
- raramente evitou
- nunca evitou

9. Voce se sente satisfeito em mostrar seus dentes quando conversa?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

10. Algumas vezes, quando as pessoas comem, elas ficam com comida presa entre os dentes. Voce ficou com comida presa entre os dentes quando comeu, nos ultimos tres meses?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

11. Se voce ficou, quanto de desconforto esta comida presa entre os dentes lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

12. As vezes as pessoas teem mau-halito. Voce acha que teve mau-halito por algum problema na sua boca, nestes ultimos tres meses?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

13. Se voce teve, quanto de desconfort este mau-halito lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

14. Voce teve que mudar a sua comida por um longo periodo de tempo (mais de tres meses) devido a algum problema com seus dentes?

- sim
- nao

15. Se sim, quanto de desprazer lhe deu esta mudanca de comida?

- extremo
- muito
- razoavel
- pouco
- nenhum

16. Voce teve que mudar o jeito de preparar sua comida por um longo periodo de tempo (mais de tres meses) devido a algum problema com seus dentes?

- sim
- nao

17. Se sim, quanto de desprazer lhe deu esta mudanca no jeito de preparar a comida?

- extremo
- muito
- razoavel
- pouco
- nenhum

18. Voce pode mastigar bem sua comida, sem os seus dentes lhe atrapalharem, nos ultimos tres meses?

- muito bem
- bem
- mais ou menos
- mal
- muito mal

19. Voce se sente satisfeito com a sua mastigacao?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

20. Voce pode morder bem sua comida (isto e, tirar um pedaco com os dentes), sem os seus dentes lhe atrapalharem, nos ultimos tres meses?

- muito bem
- bem
- mais ou menos
- mal
- muito mal

21. Voce se sente satisfeito com a sua capacidade de morder sua comida?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

22. Voce teve algum dente mole nestes ultimos tres meses?

- sim
- nao

23. Se sim, quanto de desconforto este/s dente/s mole/s lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

24. Voce teve dor de dente espontanea, isto e, seu dente doeu 'sozinho', nos ultimos tres meses?

- sim
- nao

25. Se sim, quanto de desconforto esta dor lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

26. Voce teve dor de dente quando bebeu ou comeu alguma coisa quente/fria ou doce nos ultimos tres meses?

- sim
- nao

27. Se sim, quanto de desconforto esta dor lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

28. Se voce teve dor, voce teve que mudar seu tipo de alimentacao desde que a dor comecou?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

29. Se sim, quanto de desprazer voce teve nesta mudanca de comida?

- extremo
- muito
- razoavel
- pouco
- nenhum

30. Voce teve alguma dor na sua articulacao temporo-mandibular nos ultimos tres meses?

- todo dia
- uma vez por semana
- menos do que uma vez por semana
- so quando faz certos movimentos
- nenhuma

31. Se sim, quanto de desconforto esta dor na articulacao lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

32. De que forma a aparencia do seu dente afetou sua capacidade de trabalho nestes ultimos tres meses?

- ajudou muito
- ajudou
- foi indiferente
- atrapalhou
- atrapalhou muito

33. Se voce teve dor de dente ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou sua capacidade de trabalho nestes ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

34. De que forma o funcionamento dos seus dentes (como mastigacao, forma de falar) afetaram sua capacidade de trabalho nos ultimos tres meses?

- ajudaram muito
- ajudaram
- foram indiferente
- atrapalharam
- atrapalharam muito

35. De que forma a aparencia do seu dente afetou seu contacto com as pessoas (por exemplo, sair com amigos) nestes ultimos tres meses?

- ajudou muito
- ajudou
- foi indiferente
- atrapalhou
- atrapalhou muito

36. Se voce teve dor de dente ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou seu contacto com as pessoas (por exemplo, sair com amigos) nestes ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

37. De que forma o funcionamento dos seus dentes (como mastigacao, forma de falar) afetaram seu contacto com as pessoas (por exemplo, sair com amigos) nos ultimos tres meses?

- ajudaram muito
- ajudaram
- foram indiferente
- atrapalharam
- atrapalharam muito

38. De que forma a aparencia do seu dente afetou sua vida afetiva nestes ultimos tres meses?

- ajudou muito
- ajudou
- foi indiferente
- atrapalhou
- atrapalhou muito

39. Se voce teve dor de dente ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou sua vida afetiva nestes ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

40. De que forma o funcionamento dos seus dentes (como mastigacao, forma de falar) afetaram sua vida afetiva nos ultimos tres meses?

- ajudaram muito
- ajudaram
- foram indiferente
- atrapalharam
- atrapalharam muito

41. Se voce teve dor de dente ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou seu sono nos ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

42. Se voce teve dor de dente ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou seu estado de tensao nos ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

43. Os seus dentes lhe influenciaram para voce se sentir seguro nos ultimos tres meses?

- ajudaram muito
- ajudaram
- foram indiferente
- atrapalharam
- atrapalharam muito

44. Os seus dentes lhe afetaram para voce se sentir embaracado nestes ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

45. Voce tem estado satisfeito, no geral, com sua gengiva, nestes ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

46. Sua gengiva sangrou nos ultimos tres meses?

- sim
- nao

47. Se sim, quanto de desconforto este sangramento na gengiva lhe deu?

- extremo
- muito
- mais ou menos
- pouco
- nada

48. Voce sentiu sensibilidade no dente (desconforto), devido a gengiva estar mais alta (com retracao), quando tomou ou comeu alguma coisa acida ou fria nestes ultimos tres meses?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

49. Se sim, quanto de desconforto esta sensibilidade lhe causou?

- extremo
- muito
- mais ou menos
- pouco
- nada

Questionario para aqueles que usam protese parcial  
(Portuguese version).

Perguntas sobre os seus dentes e sobre sua protese (aparelho) serao feitas. Nao ha resposta certa ou errada. Sinta-se a vontade para perguntar qualquer duvida.

1. Voce tem estado satisfeito, no geral, com os seus dentes nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

2. Voce tem estado satisfeito, no geral, com sua protese nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

3. Os seus dentes ou protese lhe causaram alguma preocupacao devido a algum problema, nos ultimos tres meses?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

4. Voce tem estado satisfeito com a aparencia dos seus dentes nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

5. Voce tem estado satisfeito com a aparencia da sua protese nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

6. Voce tem estado satisfeito com a cor dos seus dentes nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

7. Voce tem estado satisfeito com a cor dos dentes da sua protese nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

8. Voce tem estado satisfeito com a posicao dos seus dentes (se sao trepados ou nao) nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

9. Algumas pessoas que nao se sentem satisfeitas com seus dentes ou protese quando conversam, evitam mostra-los muito. Voce tem evitado, nos ultimos tres meses, mostrar seus dentes ou protese quando conversa?

- sempre evitou
- frequentemente evitou
- as vezes evitou
- raramente evitou
- nunca evitou

10. Voce se sente satisfeito em mostrar seus dentes ou protese quando conversa?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

11. E quando voce sorriu, voce evitou mostrar seus dentes ou protese nestes ultimos tres meses?

- sempre evitou
- frequentemente evitou
- as vezes evitou
- raramente evitou
- nunca evitou

12. Voce se sente satisfeito em mostrar seus dentes ou protese quando conversa?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

13. Algumas vezes, quando as pessoas comem, elas ficam com comida presa entre os dentes ou protese. Voce ficou com comida presa entre os dentes ou protese quando comeu, nos ultimos tres meses?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

14. Se voce ficou, quanto de desconforto voce teve, devido a esta comida presa entre os dentes ou protese?

- extremo
- muito
- razoavel
- pouco
- nenhum

15. As vezes as pessoas tem mau-halito. Voce acha que teve mau-halito por algum problema na sua boca, nestes ultimos tres meses?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

16. Se voce teve, quanto de desconforto este mau-halito lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

17. Voce teve que mudar a sua comida por um longo periodo de tempo (mais de tres meses) devido a algum problema com seus dentes?

- sim
- nao

18. Voce teve que mudar a sua comida por um longo periodo de tempo (mais de tres meses) devido a algum problema com sua protese?

- sim
- nao

19. Se sim, quanto de desprazer lhe deu esta mudanca de comida?

- extremo
- muito
- razoavel
- pouco
- nenhum

20. Voce teve que mudar o jeito de preparar sua comida por um longo periodo de tempo (mais de tres meses) devido a algum problema com seus dentes ou protese?

- sim
- nao

21. Se sim, quanto de desprazer lhe deu esta mudanca no jeito de preparar a comida?

- extremo
- muito
- razoavel
- pouco
- nenhum

22. Voce pode mastigar bem sua comida, sem os seus dentes ou protese lhe atrapalharem, nos ultimos tres meses?

- muito bem
- bem
- mais ou menos
- mal
- muito mal

23. Voce se sente satisfeito com a sua mastigacao?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

24. Voce pode morder bem sua comida (isto e, tirar um pedaco com os dentes), sem os seus dentes ou protese lhe atrapalharem, nos ultimos tres meses?

- muito bem
- bem
- mais ou menos
- mal
- muito mal

25. Voce se sente satisfeito com a sua capacidade de morder sua comida?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

26. Voce teve algum dente mole nestes ultimos tres meses?

- sim
- nao

27. Se sim, quanto de desconforto este/s dente/s mole/s lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

28. Voce teve dor de dente espontanea, isto e, seu dente doeu 'sozinho', nos ultimos tres meses?

- sim
- nao

29. Se sim, quanto de desconforto esta dor lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

30. Voce teve dor de dente quando bebeu ou comeu alguma coisa quente/fria ou doce nos ultimos tres meses?

- sim
- nao

31. Se sim, quanto de desconforto esta dor lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

32. Se voce teve dor, voce teve que mudar seu tipo de alimentacao desde que a dor comeceu?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

33. Voce teve alguma dor causada pela sua protese nos ultimos tres meses?

- sim
- nao

34. Se sim, quanto de desconforto esta dor lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

35. Se voce teve dor, voce teve que mudar seu tipo de alimentacao desde que a dor comecou?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

36. Se sim, quanto de desprazer voce teve nesta mudanca de comida?

- extremo
- muito
- razoavel
- pouco
- nenhum

37. Voce teve alguma dor na sua articulacao temporo-mandibular nos ultimos tres meses?

- todo dia
- uma vez por semana
- menos do que uma vez por semana
- so quando faz certos movimentos
- nenhuma

38. Se sim, quanto de desconforto esta dor na articulacao lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

39. De que forma a aparencia do seu dente ou protese afetou sua capacidade de trabalho nestes ultimos tres meses?

- ajudou muito
- ajudou
- foi indiferente
- atrapalhou
- atrapalhou muito

40. Se voce teve dor de dente, dor causada pela protese ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou sua capacidade de trabalho nestes ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

41. De que forma o funcionamento dos seus dentes ou protese (como mastigacao, forma de falar) afetaram sua capacidade de trabalho nos ultimos tres meses?

- ajudaram muito
- ajudaram
- foram indiferente
- atrapalharam
- atrapalharam muito

42. De que forma a aparencia do seus dentes ou protese afetou seu contacto com as pessoas (por exemplo, sair com amigos) nestes ultimos tres meses?

- ajudou muito
- ajudou
- foi indiferente
- atrapalhou
- atrapalhou muito

43. Se voce teve dor de dente, dor causada pela protese ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou seu contacto com as pessoas (por exemplo, sair com amigos) nestes ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

44. De que forma o funcionamento dos seus dentes ou protese (como mastigacao, forma de falar) afetaram seu contacto com as pessoas (por exemplo, sair com amigos) nos ultimos tres meses?

- ajudaram muito
- ajudaram
- foram indiferente
- atrapalharam
- atrapalharam muito

45. De que forma a aparencia do seus dentes ou protese afetou sua vida afetiva nestes ultimos tres meses?

- ajudou muito
- ajudou
- foi indiferente
- atrapalhou
- atrapalhou muito

46. Se voce teve dor de dente, dor causada pela protese ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou sua vida afetiva nestes ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

47. De que forma o funcionamento dos seus dentes ou protese (como mastigacao, forma de falar) afetaram sua vida afetiva nos ultimos tres meses?

- ajudaram muito
- ajudaram
- foram indiferente
- atrapalharam
- atrapalharam muito

48. Se voce teve dor de dente, dor causada pela protese ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou seu sono nos ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

49. Se voce teve dor de dente, dor causada pela protese ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou seu estado de tensao nos ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

50. Os seus dentes ou protese lhe influenciaram para voce se sentir seguro nos ultimos tres meses?

- ajudaram muito
- ajudaram
- foram indiferente
- atrapalharam
- atrapalharam muito

51. Os seus dentes ou protese lhe afetaram para voce se sentir embaracado nestes ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

52. Voce tem estado satisfeito, no geral, com sua gengiva, nestes ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

53. Sua gengiva sangrou nos ultimos tres meses?

- sim
- nao

54. Se sim, quanto de desconforto este sangramento na gengiva lhe deu?

- extremo
- muito
- mais ou menos
- pouco
- nada

55. Voce sentiu sensibilidade no dente (desconforto), devido a gengiva estar mais alta (com retracao), quando tomou ou comeu alguma coisa acida ou fria nestes ultimos tres meses?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

56. Se sim, quanto de desconforto esta sensibilidade lhe causou?

- extremo
- muito
- mais ou menos
- pouco
- nada

Questionario para aqueles que usam dentadura  
(Portuguese version).

Perguntas sobre os seus dentes e sobre sua dentadura (chapa) serao feitas. Nao ha resposta certa ou errada. Sinta-se a vontade para perguntar qualquer duvida.

1. Voce tem estado satisfeito, no geral, com os seus dentes nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

2. Voce tem estado satisfeito, no geral, com sua dentadura nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

3. Os seus dentes ou dentadura lhe causaram alguma preocupacao devido a algum problema, nos ultimos tres meses?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

4. Voce tem estado satisfeito com a aparencia dos seus dentes nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

5. Voce tem estado satisfeito com a aparencia da sua dentadura nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

6. Voce tem estado satisfeito com a cor dos seus dentes nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

7. Voce tem estado satisfeito com a cor dos dentes da sua dentadura nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

8. Voce tem estado satisfeito com a posicao dos seus dentes (se sao trepados ou nao) nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

9. Algumas pessoas que nao se sentem satisfeitas com seus dentes ou dentadura quando conversam, evitam mostra-los muito. Voce tem evitado, nos ultimos tres meses, mostrar seus dentes ou dentadura quando conversa?

- sempre evitou
- frequentemente evitou
- as vezes evitou
- raramente evitou
- nunca evitou

10. Voce se sente satisfeito em mostrar seus dentes ou dentadura quando conversa?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

11. E quando voce sorriu, voce evitou mostrar seus dentes ou dentadura nestes ultimos tres meses?

- sempre evitou
- frequentemente evitou
- as vezes evitou
- raramente evitou
- nunca evitou

12. Voce se sente satisfeito em mostrar seus dentes ou dentadura quando conversa?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

13. Algumas vezes, quando as pessoas comem, elas ficam com comida presa entre os dentes ou dentadura. Voce ficou com comida presa entre os dentes ou dentadura quando comeu, nos ultimos tres meses?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

14. Se voce ficou, quanto de desconforto voce teve, devido a esta comida presa entre os dentes ou dentadura?

- extremo
- muito
- razoavel
- pouco
- nenhum

15. As vezes as pessoas tem mau-halito. Voce acha que teve mau-halito por algum problema na sua boca, nestes ultimos tres meses?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

16. Se voce teve, quanto de desconforto este mau-halito lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

17. Voce tem sentido como se estivesse com a boca 'cheia' por causa da dentadura, nestes ultimos tres meses?

- sim
- nao

18. Se sim, quanto de desconforto esta sensacao lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

19. A sua dentadura muda o gosto da sua comida?

- sim
- nao

20. Se sim, quanto de desconforto esta mudanca no gosto da comida lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

21. A sua dentadura mudou a forma de voce falar nestes ultimos tres meses?

- sim
- nao

22. Se sim, quanto de desconforto esta mudanca na forma de falar lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

23. Voce teve que mudar a sua comida por um longo periodo de tempo (mais de tres meses) devido a algum problema com seus dentes?

- sim
- nao

24. Voce teve que mudar a sua comida por um longo periodo de tempo (mais de tres meses) devido a algum problema com sua dentadura?

- sim
- nao

25. Se sim, quanto de desprazer lhe deu esta mudanca de comida?

- extremo
- muito
- razoavel
- pouco
- nenhum

26. Voce teve que mudar o jeito de preparar sua comida por um longo periodo de tempo (mais de tres meses) devido a algum problema com seus dentes ou dentadura?

- sim
- nao

27. Se sim, quanto de desprazer lhe deu esta mudanca no jeito de preparar a comida?

- extremo
- muito
- razoavel
- pouco
- nenhum

28. Voce pode mastigar bem sua comida, sem os seus dentes ou dentadura lhe atrapalharem, nos ultimos tres meses?

- muito bem
- bem
- mais ou menos
- mal
- muito mal

29. Voce se sente satisfeito com a sua mastigacao?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

30. Voce pode morder bem sua comida (isto e, tirar um pedaco com os dentes), sem os seus dentes ou dentadura lhe atrapalharem, nos ultimos tres meses?

- muito bem
- bem
- mais ou menos
- mal
- muito mal

31. Voce se sente satisfeito com a sua capacidade de morder sua comida?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

32. Voce teve algum dente mole nestes ultimos tres meses?

- sim
- nao

33. Se sim, quanto de desconforto este/s dente/s mole/s lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

34. Voce teve dor de dente espontanea, isto e, seu dente doeu 'sozinho', nos ultimos tres meses?

- sim
- nao

35. Se sim, quanto de desconforto esta dor lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

36. Voce teve dor de dente quando bebeu ou comeu alguma coisa quente/fria ou doce nos ultimos tres meses?

- sim
- nao

37. Se sim, quanto de desconforto esta dor lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

38. Se voce teve dor, voce teve que mudar seu tipo de alimentacao desde que a dor comeceu?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

39. Voce teve alguma dor causada pela sua dentadura nos ultimos tres meses?

- sim
- nao

40. Se sim, quanto de desconforto esta dor lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

41. Se voce teve dor, voce teve que mudar seu tipo de alimentacao desde que a dor comeceu?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

42. Se sim, quanto de desprazer voce teve nesta mudanca de comida?

- extremo
- muito
- razoavel
- pouco
- nenhum

43. Voce teve alguma dor na sua articulacao temporo-mandibular nos ultimos tres meses?

- todo dia
- uma vez por semana
- menos do que uma vez por semana
- so quando faz certos movimentos
- nenhuma

44. Se sim, quanto de desconforto esta dor na articulacao lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

45. De que forma a aparencia do seu dente ou dentadura afetou sua capacidade de trabalho nestes ultimos tres meses?

- ajudou muito
- ajudou
- foi indiferente
- atrapalhou
- atrapalhou muito

46. Se voce teve dor de dente, dor causada pela dentadura ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou sua capacidade de trabalho nestes ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

47. De que forma o funcionamento dos seus dentes ou dentadura (como mastigacao, forma de falar) afetaram sua capacidade de trabalho nos ultimos tres meses?

- ajudaram muito
- ajudaram
- foram indiferente
- atrapalharam
- atrapalharam muito

48. De que forma a aparencia do seus dentes ou dentadura afetou seu contacto com as pessoas (por exemplo, sair com amigos) nestes ultimos tres meses?

- ajudou muito
- ajudou
- foi indiferente
- atrapalhou
- atrapalhou muito

49. Se voce teve dor de dente, dor causada pela dentadura ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou seu contacto com as pessoas (por exemplo, sair com amigos) nestes ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

50. De que forma o funcionamento dos seus dentes ou dentadura (como mastigacao, forma de falar) afetaram seu contacto com as pessoas (por exemplo, sair com amigos) nos ultimos tres meses?

- ajudaram muito
- ajudaram
- foram indiferente
- atrapalharam
- atrapalharam muito

51. De que forma a aparencia do seus dentes ou dentadura afetou sua vida afetiva nestes ultimos tres meses?

- ajudou muito
- ajudou
- foi indiferente
- atrapalhou
- atrapalhou muito

52. Se voce teve dor de dente, dor causada pela dentadura ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou sua vida afetiva nestes ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

53. De que forma o funcionamento dos seus dentes ou dentadura (como mastigacao, forma de falar) afetaram sua vida afetiva nos ultimos tres meses?

- ajudaram muito
- ajudaram
- foram indiferente
- atrapalharam
- atrapalharam muito

54. Se voce teve dor de dente, dor causada pela dentadura ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou seu sono nos ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

55. Se voce teve dor de dente, dor causada pela dentadura ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou seu estado de tensao nos ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

56. Os seus dentes ou dentadura lhe influenciaram para voce se sentir seguro nos ultimos tres meses?

- ajudaram muito
- ajudaram
- foram indiferente
- atrapalharam
- atrapalharam muito

57. Os seus dentes ou dentadura lhe afetaram para voce se sentir embaracado nestes ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

58. Voce tem estado satisfeito, no geral, com sua gengiva, nestes ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

59. Sua gengiva sangrou nos ultimos tres meses?

- sim
- nao

60. Se sim, quanto de desconforto este sangramento na gengiva lhe deu?

- extremo
- muito
- mais ou menos
- pouco
- nada

61. Voce sentiu sensibilidade no dente (desconforto), devido a gengiva estar mais alta (com retracao), quando tomou ou comeu alguma coisa acida ou fria nestes ultimos tres meses?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

62. Se sim, quanto de desconforto esta sensibilidade lhe causou?

- extremo
- muito
- mais ou menos
- pouco
- nada

Questionario para aqueles que usam dentadura e protese parcial  
(Portuguese version).

Perguntas sobre os seus dentes, sua protese parcial (aparelho) e sobre sua dentadura (chapa) serao feitas. Nao ha resposta certa ou errada. Sinta-se a vontade para perguntar qualquer duvida.

1. Voce tem estado satisfeito, no geral, com os seus dentes nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

2. Voce tem estado satisfeito, no geral, com sua protese parcial (aparelho) nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

3. Voce tem estado satisfeito, no geral, com sua dentadura nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

4. Os seus dentes ou dentadura lhe causaram alguma preocupacao devido a algum problema, nos ultimos tres meses?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

5. Voce tem estado satisfeito com a aparencia dos seus dentes nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

6. Voce tem estado satisfeito com a aparencia da sua prostese parcial nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

7. Voce tem estado satisfeito com a aparencia da sua dentadura nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

8. Voce tem estado satisfeito com a cor dos seus dentes nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

9. Voce tem estado satisfeito com a cor dos dentes da sua protese parcial nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

10. Voce tem estado satisfeito com a cor dos dentes da sua dentadura nos ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

11. Algumas pessoas que nao se sentem satisfeitas com seus dentes ou dentadura quando conversam, evitam mostra-los muito. Voce tem evitado, nos ultimos tres meses, mostrar seus dentes ou dentadura quando conversa?

- sempre evitou
- frequentemente evitou
- as vezes evitou
- raramente evitou
- nunca evitou

12. Voce se sente satisfeito em mostrar seus dentes ou dentadura quando conversa?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

13. E quando voce sorriu, voce evitou mostrar seus dentes ou dentadura nestes ultimos tres meses?

- sempre evitou
- frequentemente evitou
- as vezes evitou
- raramente evitou
- nunca evitou

14. Voce se sente satisfeito em mostrar seus dentes ou dentadura quando conversa?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

15. Algumas vezes, quando as pessoas comem, elas ficam com comida presa entre os dentes ou dentadura. Voce ficou com comida presa entre os dentes ou dentadura quando comeu, nos ultimos tres meses?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

16. Se voce ficou, quanto de desconforto voce teve, devido a esta comida presa entre os dentes ou dentadura?

- extremo
- muito
- razoavel
- pouco
- nenhum

17. As vezes as pessoas tem mau-halito. Voce acha que teve mau-halito por algum problema na sua boca, nestes ultimos tres meses?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

18. Se voce teve, quanto de desconforto este mau-halito lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

19. Voce tem sentido como se estivesse com a boca 'cheia' por causa da dentadura, nestes ultimos tres meses?

- sim
- nao

20. Se sim, quanto de desconforto esta sensacao lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

21. A sua dentadura muda o gosto da sua comida?

- sim
- nao

22. Se sim, quanto de desconforto esta mudanca no gosto da comida lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

23. A sua dentadura mudou a forma de voce falar nestes ultimos tres meses?

- sim
- nao

24. Se sim, quanto de desconforto esta mudanca na forma de falar lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

25. Voce teve que mudar a sua comida por um longo periodo de tempo (mais de tres meses) devido a algum problema com seus dentes?

- sim
- nao

26. Voce teve que mudar a sua comida por um longo periodo de tempo (mais de tres meses) devido a algum problema com sua protese parcial?

- sim
- nao

27. Voce teve que mudar a sua comida por um longo periodo de tempo (mais de tres meses) devido a algum problema com sua dentadura?

- sim
- nao

28. Se sim, quanto de desprazer lhe deu esta mudanca de comida?

- extremo
- muito
- razoavel
- pouco
- nenhum

29. Voce teve que mudar o jeito de preparar sua comida por um longo periodo de tempo (mais de tres meses) devido a algum problema com seus dentes ou dentadura?

- sim
- nao

30. Se sim, quanto de desprazer lhe deu esta mudanca no jeito de preparar a comida?

- extremo
- muito
- razoavel
- pouco
- nenhum

31. Voce pode mastigar bem sua comida, sem os seus dentes ou dentadura lhe atrapalharem, nos ultimos tres meses?

- muito bem
- bem
- mais ou menos
- mal
- muito mal

32. Voce se sente satisfeito com a sua mastigacao?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

33. Voce pode morder bem sua comida (isto e, tirar um pedaco com os dentes), sem os seus dentes ou dentadura lhe atrapalharem, nos ultimos tres meses?

- muito bem
- bem
- mais ou menos
- mal
- muito mal

34. Voce se sente satisfeito com a sua capacidade de morder sua comida?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

35. Voce teve algum dente mole nestes ultimos tres meses?

- sim
- nao

36. Se sim, quanto de desconforto este/s dente/s mole/s lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

37. Voce teve dor de dente espontanea, isto e, seu dente doeu 'sozinho', nos ultimos tres meses?

- sim
- nao

38. Se sim, quanto de desconforto esta dor lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

39. Voce teve dor de dente quando bebeu ou comeu alguma coisa quente/fria ou doce nos ultimos tres meses?

- sim
- nao

40. Se sim, quanto de desconforto esta dor lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

41. Se voce teve dor, voce teve que mudar seu tipo de alimentacao desde que a dor comecou?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

42. Voce teve alguma dor causada pela sua protese parcial nos ultimos tres meses?

- sim
- nao

43. Se sim, quanto de desconforto esta dor lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

44. Voce teve alguma dor causada pela sua dentadura nos ultimos tres meses?

- sim
- nao

45. Se sim, quanto de desconforto esta dor lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

46. Se voce teve dor, voce teve que mudar seu tipo de alimentacao desde que a dor comecou?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

47. Se sim, quanto de desprazer voce teve nesta mudanca de comida?

- extremo
- muito
- razoavel
- pouco
- nenhum

48. Voce teve alguma dor na sua articulacao temporo-mandibular nos ultimos tres meses?

- todo dia
- uma vez por semana
- menos do que uma vez por semana
- so quando faz certos movimentos
- nenhuma

49. Se sim, quanto de desconforto esta dor na articulacao lhe deu?

- extremo
- muito
- razoavel
- pouco
- nenhum

50. De que forma a aparencia do seu dente ou dentadura afetou sua capacidade de trabalho nestes ultimos tres meses?

- ajudou muito
- ajudou
- foi indiferente
- atrapalhou
- atrapalhou muito

51. Se voce teve dor de dente, dor causada pela dentadura ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou sua capacidade de trabalho nestes ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

52. De que forma o funcionamento dos seus dentes ou dentadura (como mastigacao, forma de falar) afetaram sua capacidade de trabalho nos ultimos tres meses?

- ajudaram muito
- ajudaram
- foram indiferente
- atrapalharam
- atrapalharam muito

53. De que forma a aparencia do seus dentes ou dentadura afetou seu contacto com as pessoas (por exemplo, sair com amigos) nestes ultimos tres meses?

- ajudou muito
- ajudou
- foi indiferente
- atrapalhou
- atrapalhou muito

54. Se voce teve dor de dente, dor causada pela dentadura ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou seu contacto com as pessoas (por exemplo, sair com amigos) nestes ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

55. De que forma o funcionamento dos seus dentes ou dentadura (como mastigacao, forma de falar) afetaram seu contacto com as pessoas (por exemplo, sair com amigos) nos ultimos tres meses?

- ajudaram muito
- ajudaram
- foram indiferente
- atrapalharam
- atrapalharam muito

56. De que forma a aparencia do seus dentes ou dentadura afetou sua vida afetiva nestes ultimos tres meses?

- ajudou muito
- ajudou
- foi indiferente
- atrapalhou
- atrapalhou muito

57. Se voce teve dor de dente, dor causada pela dentadura ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou sua vida afetiva nestes ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

58. De que forma o funcionamento dos seus dentes ou dentadura (como mastigacao, forma de falar) afetaram sua vida afetiva nos ultimos tres meses?

- ajudaram muito
- ajudaram
- foram indiferente
- atrapalharam
- atrapalharam muito

59. Se voce teve dor de dente, dor causada pela dentadura ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou seu sono nos ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

60. Se voce teve dor de dente, dor causada pela dentadura ou dor na sua articulacao temporo-mandibular, quanto esta dor afetou seu estado de tensao nos ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

61. Os seus dentes ou dentadura lhe influenciaram para voce se sentir seguro nos ultimos tres meses?

- ajudaram muito
- ajudaram
- foram indiferente
- atrapalharam
- atrapalharam muito

62. Os seus dentes ou dentadura lhe afetaram para voce se sentir e7mbaracado nestes ultimos tres meses?

- extremamente
- muito
- mais ou menos
- pouco
- nada

63. Voce tem estado satisfeito, no geral, com sua gengiva, nestes ultimos tres meses?

- muito satisfeito
- satisfeito
- mais ou menos
- insatisfeito
- muito insatisfeito

64. Sua gengiva sangrou nos ultimos tres meses?

- sim
- nao

65. Se sim, quanto de desconforto este sangramento na gengiva lhe deu?

- extremo
- muito
- mais ou menos
- pouco
- nada

66. Voce sentiu sensibilidade no dente (desconforto), devido a gengiva estar mais alta (com retracao), quando tomou ou comeu alguma coisa acida ou fria nestes ultimos tres meses?

- sempre
- frequentemente
- as vezes
- raramente
- nunca

67. Se sim, quanto de desconforto esta sensibilidade lhe causou?

- extremo
- muito
- mais ou menos
- pouco
- nada

## QUESTIONNAIRE ITEMS

Items of the questionnaire were adapted from other instruments used in subjective measures. The following list relates each question with the specific questionnaire to which it has been adapted.

## Basic questionnaire

1. Satisfaction with teeth (adapted from 'The Social Impact of Dental Disease')
2. Worry with teeth, prosthesis or denture (adapted from 'Social and Psychological Factors in Dental Health in Israel')
3. Satisfaction with appearance of teeth (adapted from 'Dental Esthetics Satisfaction in Adults')
4. Satisfaction with colour of teeth (adapted from 'Dental Esthetics Satisfaction in Adults')
5. Satisfaction with position of teeth (adapted from 'Dental Esthetics Satisfaction in Adults')
6. Avoid showing teeth when talking (adapted from 'The Social Impact of Dental Disease')
7. Satisfaction showing teeth when talking (adapted from 'The Social Impact of Dental Disease')
8. Avoid showing teeth when smiling (adapted from 'The Social Impact of Dental Disease')
9. Satisfaction showing teeth when smiling (adapted from 'The Social Impact of Dental Disease')

10. Food packing (adapted from 'The Social Impact of Dental Disease')
11. Discomfort because of food packing (adapted from 'The Social Impact of Dental Disease')
12. Halitosis (adapted from 'The Social Impact of Dental Disease')
13. Discomfort because of halitosis (adapted from 'The Social Impact of Dental Disease')
14. Changing types of food because of teeth (adapted from 'The Social Impact of Dental Disease')
15. Displeasure because of changing types of food (adapted from 'The Social Impact of Dental Disease')
16. Changing way of preparing food because of teeth (adapted from 'The Social Impact of Dental Disease')
17. Displeasure because of changing way of preparing food (adapted from 'The Social Impact of Dental Disease')
18. Capacity to chew (adapted from 'The Social Impact of Dental Disease')
19. Satisfaction with chewing (adapted from 'The Social Impact of Dental Disease')
20. Capacity to bite (adapted from 'The Social Impact of Dental Disease')
21. Satisfaction with biting (adapted from 'The Social Impact of Dental Disease')
22. Loose teeth (adapted from 'Adult Survey - Adult Dental Health')
23. Displeasure with loose teeth (adapted from 'Adult Survey - Adult Dental Health')

24. Spontaneous pain (adapted from 'Dental Conditions and the Quality of Life')
25. Discomfort because of this pain (adapted from 'Dental Conditions and the Quality of Life')
26. Pain when eating/ hot or cold (adapted from 'Adult Survey - Adult Dental Health')
27. Discomfort because of this pain (adapted from 'Adult Survey - Adult Dental Health')
28. Changing food because of pain (adapted from 'The Social Impact of Dental Disease')
29. Displeasure because of changing food (adapted from 'The Social Impact of Dental Disease')
30. TMJ pain (adapted from 'Adult Survey - Adult Dental Health')
31. Discomfort because of this pain (adapted from 'Adult Survey - Adult Dental Health')
32. Working capacity affected by appearance of teeth (adapted from 'Social and Psychological Factors in Dental Health in Israel')
33. Working capacity affected by pain (adapted from 'Dental Conditions and the Quality of Life')
34. Working capacity affected by eating, talking (adapted from 'Nottingham Health Profile')
35. Contact with people affected by appearance of teeth (adapted from 'Social and Psychological Factors in Dental Health in Israel')
36. Contact with people affected by pain (adapted from 'Dental Conditions and the Quality of Life')

37. Contact with people affected by eating, talking (adapted from 'Nottingham Health Profile')
38. Romance affected by appearance of teeth (adapted from 'Social and Psychological Factors in Dental Health in Israel')
39. Romance affected by pain (adapted from 'Dental Conditions and the Quality of Life')
40. Romance affected by eating, talking (adapted from 'Nottingham Health Profile')
41. Bad sleeping affected by pain (adapted from 'Dental Conditions and the Quality of Life')
42. Stress caused by pain (adapted from 'Dental Conditions and the Quality of Life')
43. Self-confidence affected by teeth (adapted from 'Subjective Well-being Questionnaire')
44. Embarrassment caused by teeth (adapted from 'The Social Impact of Dental Disease')
45. Satisfaction with gums (adapted from 'The Social Impact of Dental Disease')
46. Bleeding gums (adapted from 'Adult survey - Adult Dental Health')
47. Discomfort because of bleeding gums (adapted from 'Adult survey - Adult Dental Health')
48. Sensitivity because of gingival recession (adapted from 'Dental Conditions and the Quality of Life')
49. Discomfort because of sensitivity (adapted from 'Dental Conditions and the Quality of Life')

## Partial prosthesis questionnaire

### Extra questions

- Satisfaction with prosthesis (adapted from 'The Social Impact of Dental Disease')
- Satisfaction with appearance of prosthesis (adapted from 'Dental Aesthetics Satisfaction in Adults')
- Satisfaction with colour of prosthetic teeth (adapted from 'Dental Aesthetics Satisfaction in Adults')
- Pain because of prosthesis (adapted from 'Dental Conditions and the Quality of Life')
- Discomfort because of this pain (adapted from 'Dental Conditions and the Quality of Life')
- Changing type of food because of prosthesis (adapted from 'The Social Impact of Dental Disease')

## Total prosthesis questionnaire

### Extra questions

- Satisfaction with denture (adapted from 'The Social Impact of Dental Disease')
- Satisfaction with appearance of denture (adapted from 'Dental Aesthetics Satisfaction in Adults')
- Satisfaction with colour of prosthetic teeth (adapted from 'Dental Aesthetics Satisfaction in Adults')
- Changing types of food because of denture (adapted from 'The Social Impact of Dental Disease')
- Feeling of a full mouth because of the denture (checking)
- Discomfort because of feeling of a full mouth (checking)
- Changing flavour of food because of denture (checking)

- Displeasure because of changing flavour (checking)
- Difficult talking because of denture (adapted from 'The Social Impact of Dental Disease')
- Displeasure because of difficult talking (adapted from 'The Social Impact of Dental Disease')
- Pain because of denture (adapted from 'Dental Conditions and the Quality of Life')
- Discomfort because of this pain (adapted from 'Dental Conditions and the Quality of Life')

### APPENDIX 3

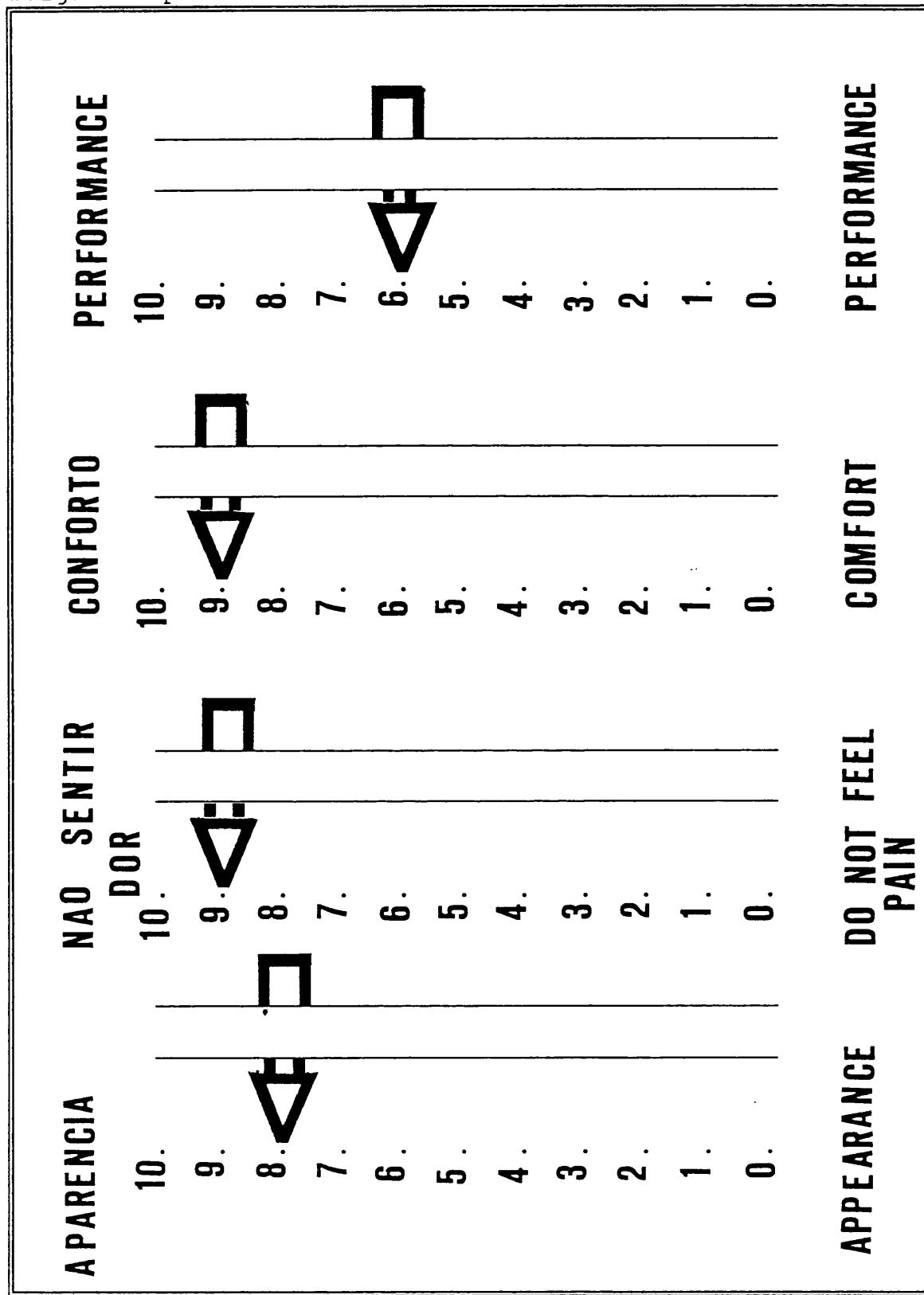
#### SCALE

The weight of dimensions were obtained by using a scale in which respondents ranked the importance of four dimensions: appearance, comfort, pain and performance.

The instrument consists of four scales ranging from 0 to 10 (0 being the lowest value and 10 the highest one) (Table AP3.1).

Scale (model):

Table AP3.1. Model of the first scale used to obtain the weight respondents attributed to dimensions.



## APPENDIX 4

### CRITERIA AND SCORING SYSTEMS USED TO ASSESS ORAL HEALTH STATUS

#### Clinical examination

1. Dental status
  - 1.1. DMFT
  - 1.2. Extension
2. Plaque
3. Periodontal status
  - 3.1. Calculus
  - 3.2. Pocket
  - 3.3. Bleeding
  - 3.4. Gingival recession
4. Mobility
5. Fluorosis, stain, attrition and other enamel disorders
6. Malocclusion
7. Temporomandibular joint
8. Denture/partial prosthesis
9. Need for denture/partial prosthesis
  - 9.1. Appearance
  - 9.2. Assessment of speech
  - 9.3. Retention
  - 9.4. Stability
  - 9.5. Central lines
  - 9.6. Defects
  - 9.7. Hygiene
  - 9.8. Mucosal reaction to dentures/full and partial

#### Clinic format

## CRITERIA AND SCORING SYSTEMS USED TO ASSESS ORAL HEALTH STATUS

Prosthetic status, periodontal and caries status, gingival recession, mobility, enamel defects and TMJ status were assessed.

Examinations took place at the participant's work place, taking on average 10 minutes. Examinations were conducted using a head-lamp to provide standard illumination. Examinations were all carried out with the examiner positioned in front of the subject, who was seated in a chair, and using No. 4 plain mouth mirrors, sickle-shaped explorer and World Health Organisation's recommended periodontal probe (CPITN probe, which was colour-coded with a black band starting at 3.5mm and ending at 5.5mm from the ball ended tip). The explorer was used only to remove debris, to check for interproximal caries and to check occlusal cavitation where doubt existed on visual inspection. All the instruments were sterilised in a dry-heat oven at 160 C for 90 minutes.

### 4.1. Clinical examination

#### 4.1.1. Dental status

The criteria used were those recommended by the World Health Organization (1987), with slight modifications. Dental status was assessed using a plain mouth mirror and a sickle-shaped explorer. All surfaces of the teeth were examined and

recorded. A tooth was considered present in the mouth when any part of it was visible or could be touched with the tip of the explorer without unduly displacing soft tissues. The DMFT and teeth surfaces involved have been assessed. These stages will now be discussed in detail.

#### 4.1.1.1. DMFT

##### .Sound teeth

A tooth was considered sound if it showed no evidence of treated or untreated caries. The stages of caries that precede cavitation, as well as other similar to the early stages of caries, are excluded because they can not be reliably diagnosed. Thus teeth with the following defects, in the absence of other positive criteria, should be coded as sound:

- white or chalky spots;
- discoloured or rough spots;
- stained pits or fissures in the enamel that catch the explorer, but do not have a detectable softened floor, undermined enamel, or softening of the walls. Dark, shiny, hard pitted areas of enamel in a tooth showing signs of a moderate or severe fluorosis.

All questionable lesions should be coded as sound.

##### .Decayed teeth

Decay was recorded as present when a lesion in a pit or fissure or on a free smooth surface had a detectable softened floor, undermined enamel, or a softened wall. On approximal surfaces the explorer tip must have entered a lesion with certainty. Where any doubt existed caries was not recorded as present.

.Filled teeth

A tooth was filled because of a previous decay but with no evidence of further decay. A tooth that had been crowned for reasons other than decay, such as trauma or a bridge abutment, was recorded as 'bridge abutment or special crown'.

.Filled with decay

A tooth was coded as filled with decay, when it had one or more permanent restorations with one or more areas that were decayed. No distinction between primary and secondary lesions was made.

.Missing teeth

A missing tooth, caused by any reason, was recorded as such.

4.1.1.2. Teeth surfaces involved

Immediately after the caries status or filling was recorded for a tooth its lesion extension was measured. Number of surfaces and if the buccal face was compromised was recorded.

#### 4.1.1.3. Scoring system

The following scoring system was used;

DMFT

- 0- Sound
- 1- Decayed
- 2- Decayed & Filled
- 3- Filled, no decay
- 4- Missing due caries
- 5- Missing for other reason
- 6- Bridge abutment or special crown
- 7- Unerupted tooth
- 8- Excluded tooth
- 9- Temporary restoration

Extension

- 0- Missing with space
- 1- One surface, except for the buccal, involved in a lesion
- 2- Two surfaces, except for the buccal, involved in a lesion
- 3- Three surfaces, except for the buccal, involved in a lesion
- 4- Four surfaces
- 5- Five surfaces
- 6- One surface, the buccal one, involved in a good colour restoration
- 7- One surface, the buccal one, involved in the lesion (or decayed or a badly coloured restoration)
- 8- Two or three surfaces, including the buccal one, involved in a good colour restoration
- 9- Two or three surfaces, including the buccal one, involved in a lesion (or decayed or a badly coloured restoration)
- 10- Missing without space.

#### 4.1.2. Plaque index

Oral debris is the soft foreign matter loosely attached to the teeth. It consists of mucin, bacteria and food, and it varies in the colour from greyish-white to green or orange. The surface area covered by the debris is estimated by running

the side of a no. 5 explorer along the tooth surface being examined. The occlusal or incisal extent of the debris is noted as it is removed. The criteria used was from the Simplified Oral Hygiene Index (Greene and Vermillon, 1964).

#### 4.1.2.1. Scoring system

- 0- No debris or stain present
- 1- Soft debris covering not more than one third of the tooth surface being examined or the presence of extrinsic stains without debris regardless of surface area covered.
- 2- Soft debris covering more than one third but not more than two thirds of the exposed tooth surface.
- 3- Soft debris covering more than two thirds of the exposed tooth surface.

#### 4.1.3. Periodontal status

Measurement of calculus, bleeding, pocketing and recession were carried out on all teeth. Assessment of calculus, bleeding and pocketing were made for one quadrant before moving to the next. The presence of calculus and pocket was checked first, and when that quadrant was complete it was checked to see if there was any bleeding.

#### 4.1.3.1. Calculus

The criteria used to assess calculus was based on 'The Simplified Oral Hygiene Index' (Greene and Vermillon, 1964), with slight modifications in the scoring system. Calculus was checked in both buccal and lingual surfaces, and were recorded separately.

#### 4.1.3.1.1. Scoring system

- 0- No calculus
- 1- Supragingival calculus covering not more than one third of the exposed tooth surface.
- 2- Supragingival calculus covering more than one third but no more than two thirds of the exposed tooth surface.
- 3- Supragingival calculus covering more than two-thirds of the exposed tooth surface.
- 4- Presence of individuals flecks of subgingival calculus around the cervical portion of the tooth.
- 5- A continuous heavy band of subgingival calculus around the cervical portion of the tooth.
- 6- Supragingival calculus covering not more than one third of the exposed tooth surface and presence of subgingival calculus.
- 7- Supragingival calculus covering more than one third but no more than two thirds of the exposed tooth surface and presence of subgingival calculus.
- 8- Supragingival calculus covering more than two-thirds of the exposed tooth surface and presence of subgingival calculus.
- 9- Missing tooth.

#### 4.1.3.2. Pocket

The criteria has been based on WHO (1987). It was measured on buccal and lingual surfaces and at the end, each tooth was given one score.

#### 4.1.3.2.1. Scoring system

- 0- No pocket
- 1- Pocket of 4 to 5mm.
- 2- Pocket of 6mm or more.
- 3- Missing tooth

#### 4.1.3.3. Bleeding

The criteria used was based on WHO (1987). Both surfaces, buccal and lingual have been recorded.

##### 4.1.3.3.1. Scoring system

- 0- No bleeding
- 1- Bleeding
- 3- Missing tooth

#### 4.1.3.4. Gingival recession

The criteria used was adapted from Cushing (1986). Both surfaces, buccal and lingual were recorded.

##### 4.1.3.4.1. Scoring system

- 0- No recession
- 1- from 0.1mm to 2mm
- 2- from 2.1mm to 3.5mm
- 3- from 3.6mm to 5.5mm
- 4- Root exposure of more than 5.5mm.

#### 4.1.4. Mobility

Mobility was assessed according to Miller's criteria (Miller, 1950). Tooth is held firmly between two instruments and moved back and forth.

#### 4.1.4.1. Scoring system

- 0- There is no detectable movement when force is applied.
- 1- Barely detectable tooth movement
- 2- When the crown of the tooth moves up to 1mm in any direction
- 3- When a movement of more than 1mm in any direction. Or if tooth can be rotated or depressed in its socket.
- 4- Missing.

#### 4.1.5. Fluorosis and other enamel disorders

This criteria has been adapted from the WHO (1987) with a some modifications. Fluorosis, stain and colour change because of endodontics trauma or treatment were included. Fluorosis was recorded as positive when there was very mild to severe fluorosis (WHO, 1987) (from 'small opaque paper-white areas scattered irregularly over the tooth, involving less than 25% of the tooth surface' to 'the general form of the teeth may be affected'). Stain and colour change because of endodontics trauma or treatment were used to assess if it affected the appearance of the mouth. Some enamel disorders such as hypoplasia and tetracycline stain were grouped. Attrition was recorded as buccal and occlusal, each given separate score. Mutilation of teeth was excluded because it is not common in Brazil.

#### 4.1.5.1. Scoring system

- 0- None, no opacities or other enamel disorders.
- 1- Fluorosis.
- 2- Changed colour because of endodontics trauma or treatment.
- 3- Hypoplasia and/or tetracycline stain.
- 4- Stain.
- 5- Buccal attrition.
- 6- Occlusal attrition.
- 7- More than one of the above conditions. The combinations should be specified by the numbers one to six.
- 8- Missing.

#### 4.1.6. Malocclusion

This criterion was adapted from the WHO (1987) and scored in two stages, the minor anomalies and the more serious ones.

##### 4.1.6.1. Scoring system - minor anomalies

- 0- No anomaly or malocclusion
- 1- Slight anomalies, such as one or more rotated or tilted teeth or slight crowding or spacing, which disturbs the regular alignment of the teeth, there is a shortage of space or overlap or irregularity in that segment of not than one premolar width (left and right segments), or one lower lateral incisor width (upper middle segment).
- 2- There is a shortage of space or overlap or irregularity in that segment to a greater extent than in the previous category.

##### 4.1.6.2. Scoring system - severe anomalies

- 0- No anomaly or malocclusion
- 1- Maxillary overjet estimated to be 9mm or more,
- 2- Mandibular overjet, anterior crossbite equal to or greater than a full tooth depth
- 3- Open bite
- 4- Midline shift estimated to be more than 4mm
- 5- Crowding or spacing estimated to be more than 4mm.

If in doubt score low.

#### 4.1.7. Temporomandibular joint

Criteria were based on the WHO criteria (1987).

##### 4.1.7.1. Score system

- 0- Normal. TMJ functions without pain, sounds or other signs of dysfunction.
- 1- Clicking. TMJ functions without pain or other signs of dysfunction, but clicking is heard on opening and closing.
- 2- Self-correcting blocking. TMJ occasionally dislocates but relocates without professional care.
- 3- Dislocation of TMJ. There is spontaneous dislocation that requires professional care.
- 4- Pain related to TMJ. There is pain in the TMJ area or elsewhere in the head, neck or shoulder region related to joint dysfunction.

#### 4.1.8. Denture/ partial prosthesis

Criteria based on the Oral Health Survey Method (WHO, 1987). The wearing of dentures were recorded for each jaw (upper and lower).

##### 4.1.8.1. Scoring system

- 0- Not wearing a denture
- 1- Wearing a partial denture
- 2- Wearing a full denture

#### 4.1.9. Need for denture/ partial prosthesis

Criteria adapted from Cushing (1986).

##### 4.1.9.1. Appearance

A subjective impression by the examiner. Good dentures blend in with other facial characteristics. Poor dentures jar against other facial characteristics.

###### 4.1.9.1.1. Scoring system

- 0- Not wearing denture
- 1- Good
- 2- Poor

##### 4.1.9.2. Assessment of speech

Was made by asking each denture wearer to read or to repeat aloud a set statement (any whistles, clicks and other disturbances of speech were noted).

###### 4.1.9.2.1. Scoring system

- 0- Not wearing denture
- 1- Satisfactory
- 2- Unsatisfactory

##### 4.1.9.3. Retention

With musculature relaxed, on opening wide - if denture dropped then it was unsatisfactory. Upper dentures exhibited

satisfactory retention when they were not easily displaced by light downward vertical finger pressure on the central incisors. Lower dentures also exhibited satisfactory retention when they were not easily displaced by light upward vertical pressure on the central incisors. Dentures with unsatisfactory retention were easily displaced.

#### 4.1.9.3.1. Scoring system

- 0- Not wearing denture
- 1- Satisfactory
- 2- Unsatisfactory

#### 4.1.9.4. Stability - fit of base

Unsatisfactory if either an over space existed between the base and underlying tissues or the denture was easily moved by pressing the plate against the supporting tissues with the fore and middle finger of each hand and then trying to tip and rotate it. If it was easily moved in either vertical and horizontal direction (rotated more than 5mm to either side) this showed unsatisfactory adaptation to the present fitting surface.

#### 4.1.9.4.1. Scoring system

- 0- Not wearing denture
- 1- Satisfactory
- 2- Unsatisfactory

#### 4.1.9.5. Centre lines - full dentures only

This is to check for deviation on opening and closing with dentures in place. This would have to be gross to be noticed and might be associated with non coincident centre lines.

##### 4.1.9.5.1 Scoring system

- 0- Not wearing denture
- 1- No deviation
- 2- Deviation

#### 4.1.9.6. Defects

This includes any missing tooth, any fractures of the base plate or major connector and any fracture clasps. A distinction was made between those defects for which repair was needed and those which were severe enough to necessitate remake of the denture/partial prosthesis.

##### 4.1.9.6.1. Scoring system

- 0- Not wearing denture
- 1- No defects
- 2- Defects requiring repair
- 3- Defects requiring remake

#### 4.1.9.7. Hygiene

No obvious hard deposits on fit or polished surface (stain alone was not recorded unless it affected appearance in which case it was recorded in the section of appearance).

#### 4.1.9.7.1. Scoring system

- 0- Not wearing denture
- 1- Good
- 2- Bad

#### 4.1.9.8. Mucosal reaction to dentures - full and partial mandibular and maxilla

When tissues presented any inflammation or granulation because of the prosthesis.

#### 4.1.9.8.1. Scoring system

- 0- Not wearing denture
- 1- Clinical normal - with no inflammation or granulation tissue
- 2- Local inflammation - those cases with red spots or small inflamed regions in otherwise normal tissue (especially visible round the orifices of the salivary ducts)
- 3- Diffuse reddening and hyperaemia - with a practically smooth surface. Reddening limited to periphery of the palate. Slight trauma usually sufficient to produce haemorrhage.
- 4- Granulated tissue - entirely or partially degenerated into nodular tissue, usually with marked hyperaemia.

#### 4.2. Clinic format

Table AP4.2.1. Clinic format

## APPENDIX 5

### SOCIO-ECONOMIC CLASSIFICATION

The socio-economic classification is based on the ABA-ABIPEME (1978) criteria. These criteria comprise eight socio-economic indicators, which cover economic information and educational level. A set of points is given to each indicator and a final score to determine the households' social class is obtained.

Higher class people were those from class A and B and lower class people those from class C and D.

The following tables show the indicators used, the number of points assigned to each of them and the total score which determine each socio-economic group.

Table AP5.1. Indicators used and the number of points assigned to each indicator.

1. ECONOMIC INDICATORS	NUMBER OF POINTS						
	none	1	2	3	4	5	6
T.V.	0	2	4	6	8	10	12
Radio	0	1	2	3	4	5	6
Bathroom	0	2	4	6	8	10	12
Motorcar	0	4	8	12	16	16	16
Maid	0	6	12	18	24	24	24
Vacuum cleaner	0	5	5	5	5	5	5
Washing machine	0	2	2	2	2	2	2

2. LEVEL OF EDUCATION INDICATOR HEAD OF THE FAMILY	NUMBER OF POINTS	
Primary school (4 years)-not completed	0	
Primary school (8 years)-not completed	1	
Secondary school (12 years)-not completed	3	
University-not completed	5	
University-completed	10	

Table AP5.2. Socio-economic groups and the final score assigned to each of them.

SOCIO ECONOMIC GROUPS	FINAL SCORE (in points)
A	more than 34
B	21 - 34
C	10 - 20
D	5 - 9
E	0 - 4

## APPENDIX 6

### SAMPLE POPULATION OF THE MAIN STUDY

The following tables present the list of places contacted in the main study and the response rate of each.

Table AP6.1. Places contacted in the main study

LIST OF THE PLACES	
BNDES	National Bank for Economic and Social Development
BNe	Brazilian Northeast Bank
CEDAE	Rio de Janeiro Water Authority
COMPANY	Clothing industry
ELETROS	Social Security Service of the Power Generating Company
JOAO FORTES ENGENHARIA	Building contractors
LNCC	National Laboratory for Scientific Computing
PETROBRAS	Brazilian Petroleum
PRESIDENTE	Building contractors
PUC	Catholic University of Rio de Janeiro
RIO DE JAN. UNDERGROUND	Rio de Janeiro Underground Company (METRO)
RIO SUL/ RIO FLAT	Shopping Centre and Apart Hotel
ROCINHA	Shanty town
SAYONARA	Clothing industry
SENDAS	Supermarket chain
SERPRO	Computer Service of the National Health Service
SESI	Social Service for the Industrial Confederation
UNIVERSAL KINGDOM CHURCH	Church

Table AP6.2. Response rate of people contacted in the main study.

PLACE	TOTAL NUMBER OF PEOPLE CONTACTED	REFUSED	ACCEPTED	EXCLUDED	TOTAL
BNDES	72	08	64	---	64
BNe	12	02	10	---	10
CEDAE	14	01	13	01	12
COMPANY	89	05	84	09	75
ELETROS	08	01	07	---	07
JOAO FORTES ENGENHARIA	62	05	57	05	52
LNCC	16	01	15	---	15
PETROBRAS	67	03	64	---	64
PRESIDENTE	18	01	17	---	17
PUC	40	03	37	01	36
RIO DE JAN. UNDERGROUND	233	28	208	16	189
RIO SUL/ RIO FLAT	08	03	05	---	05
ROCINHA	08	02	06	01	05
SAYONARA	58	05	53	02	51
SENDAS	11	01	10	01	09
SERPRO	20	02	18	---	18
SESI	29	02	27	---	27
UNIVERSAL KINGDOM CHURCH	06	---	06	---	06
<b>TOTAL</b>	<b>771</b>	<b>73</b>	<b>698</b>	<b>*36</b>	<b>662</b>

\* Excluded: 36 people were excluded, 15 because risk of bias and 21 belonged to the original edentulous group which has been dropped from the study.

## APPENDIX 7

### RESPONSE RATE

The study had several stages, the pre-pilot study, the pilot study, the main study and the complementary study. The following tables show the response rates and the last table presents the response rate of the whole sample population.

Table AP7.1. Response rate of the pre-pilot study.

	Individuals contacted	Interviews	Clinical examination
Open interviews	groups/ individuals (portuguese community)	groups/ individuals (portuguese community)	-----
Pre-pilot study	19 (brazilian students in London)	19 (brazilian students in London)	-----

Table AP7.2. Response rate on the pilot study.

Individuals contacted	Did not accept	Accepted	First interviews	Following interviews
67 (100%)	8 (12%)	59 (88%)	10 (15%)	49 (73%)

Table AP7.3. Response rate on the main study.

	People contacted	Did not accept	Did accept	Excluded	Participated
Main study	771 100%	73 9.5%	698 90.5%	36 4.7%	662 85.7%

Table AP7.4. Response rate on the complementary study.

	Pilot study	Main study	Total
Invited	31 (100%)	60 (100%)	91 (100%)
Did not accept/answer	3 (8%)	11 (18%)	14 (15%)
Excluded	0	5 (8%)	5 (6%)
Participated	28 (92%)	44 (73%)	72 (79%)

Table AP7.5. Total sample population on the research.

	Individuals contacted	Accepted	Did not accept	Excluded	Total
Pre-pilot study	19 (100%)	19 (100%)	-----	-----	19 (100%)
Pilot study (73.13%)	67 (100%)	59 (88.1%)	8 (11.9%)	10 (14.9%)	49
Main study	771 (100%)	698 (90.5%)	73 (9.5%)	36 (4.7%)	662 (85.9%)
Complementary Pilot study	31 (100%)	28 (90.3%)	3 (9.7%)	-----	28 (90.3%)
Complementary Main study	60 (100%)	48 (80%)	7 (11.7%)	9* (15%)	44 (73%)
Total	948 (100%)	852 (89.9%)	91 (9.6%)	55 (5.8%)	802 (84.6%)

\* Excluded because of undelivered questionnaires.

## APPENDIX 8

### CONSISTENCY OF CLINICAL EXAMINATIONS

The WHO (1987) recognizes the need for standardized and consistent diagnoses of oral health status of populations (WHO, 1987).

Probably, the most reliable way of assessing overall examiner agreement is the 'Cohen's kappa' test. 'The kappa statistic relates the actual measure of agreement obtained with the degree of agreement which would have been attained had the diagnoses been at random, or, in other words, the extent to which the actual degree of agreement recorded improves upon chance' (Bulman and Osborn, 1989). It has been suggested that a score over 0.8 indicates a good agreement, over 0.6 indicates substantial agreement and over 0.4 moderate agreement (Landis and Koch 1977).

Throughout the field work each sixth person after a group of fifty was re-examined. Of the 698 persons, 84 people were re-examined. The participants for the second examination were recalled on the day following the first examination in an attempt to reduce the likelihood of the researcher remembering the measures recorded. Both exams have been assessed for agreement using Kappa Coefficient of Agreement.

Each condition has been considered separately; decayed teeth, missing teeth, filled teeth, sound teeth, plaque, bleeding, calculus, mobility, pocket, gingival recession, stain, fluorosis, enamel disorders, attrition, TMJ,

malocclusion. Presence or absence of prosthesis and their status were checked.

For decayed teeth, Kappa Coefficient was 0.98 (98%), for filled teeth, 0.95 (95%), for missing teeth, 1.00 (100%), for sound teeth, 0.95 (95%), for plaque, 0.88 (88%), for bleeding 0.89 (89%), for calculus 0.98 (98%), for mobility 1.00 (100%), for pocket 0.99 (99%), for gingival recession 0.99 (99%), for stain 0.95 (95%), for fluorosis 0.98 (98%), for enamel disorders 0.98 (98%), for attrition 0.97 (97%). for TMJ 0.92 (92%), for malocclusion 0.96 (96%). For presence or absence of prostheses, Kappa coefficient was 1.00 (100%), prosthesis appearance 0.99 (99%), assessment of speech 0.98 (98%), retention 0.98 (98%), stability 0.98 (98%), defects 0.99 (99%), hygiene 0.98 (98%) and for mucosal reaction 0.98 (98%).

These results showed a highly consistent diagnostic criteria throughout the field work, implying a high intra-examiner reliability.

For decayed teeth  
numbers

## APPENDIX 9

### COMPLEMENTARY STUDY - QUESTIONNAIRE

A complementary study was done to assess the weighting of each question used in the questionnaire and to establish the validity of the scale, both used in the main study.

The complementary study was done in London with Brazilians students living in London. A questionnaire was posted to 60 students. The questionnaire used was patterned on the 'Social Readjustment Rating Scale' (SRRS) developed by Holmes and Rahe (1967).

The instrument used in the complementary study was composed of two parts. The first consisted of 36 items and the second consisted of 4 items. Two versions of this instrument is presented below, one in Portuguese and another in English. In addition, a letter introducing the study to respondents is presented.

## Questionnaire (Portuguese version)

Essa pesquisa esta sendo feita para medir o impacto de saude oral na vida das pessoas.

Tenho pedido a um grupo de pessoas que marquem a importancia de certos itens sobre saude oral atraves de um questionario. Nao ha resposta certa ou errada. Nem nomes ou resposta que possam levar ao respondente serao publicados. E estritamente confidencial.

Gostaria de saber se voce poderia gentilmente participar desta pesquisa, respondendo a escala segundo as instrucoes e o exemplo abaixo:

Instrucoes para marcar a escala:

Por exemplo, 'poluicao do ar' recebeu um valor arbitrario de 500. Leia as condicoes abaixo e pense com voce, o quanto cada uma e pior, igual ou melhor do que 'poluicao do ar'. Se voce achar que o item e melhor, escolha um numero proporcionalmente maior e escreva no espaco diretamente oposto a este item, na coluna marcada 'valores'. Caso voce decida que o item e pior, escreva um numero proporcionalmente menor no espaco do lado oposto. Se o item tiver um valor igual a 'poluicao do ar', marque o valor 500 no espaco oposto ao item.

Condicoes	Valores
Poluicao do ar	500
Poluicao da agua	-----
(Poluicao da agua e pior, melhor ou tem o mesmo valor do que poluicao do ar? E pior. O quanto pior do que 500?)	
Poluicao sonora	-----
(Poluicao sonora e pior, melhor ou tem o mesmo valor do que poluicao do ar? Tem o mesmo valor. Entao o valor e 500)	
Poluicao visual	-----
(Poluicao visual e pior, melhor ou tem o mesmo valor do que poluicao do ar? E melhor. O quanto melhor do que 500?)	

Muito obrigada pelo auxilio,

## RESPONDA

Nota: Voce pode ter obrigatoriamente as condicoes relacionadas abaixo. Para avaliar os itens, imagine as condicoes citadas e julgue a que voce acha pior, igual ou melhor do que a que teve o valor de 500 atribuido.

### Grupo numero 1:

- O quanto essa condicao e melhor, igual ou pior do que satisfaco com a aparencia geral dos dentes?

Condicoes	Valores
-----------	---------

• Estar satisfeito com a aparencia geral dos dentes.	500
• Estar satisfeito com a cor dos dentes.	-----
• Estar satisfeito com os dentes no geral.	-----
• Estar satisfeito com a posicao dos dentes (se eles sao trepados ou nao).	-----

Grupo numero 2:

.O quanto essa condicao e melhor, igual ou pior do que nao ter dor de dente quando come ou bebe?

Condicoes	Valores
. <u>Nao ter</u> dor de dente quando come ou bebe.	500
. <u>Nao ter</u> dor de dente espontanea (quando o dente doi sozinho).	-----
. <u>Nao ter</u> que mudar o tipo de comida devido a alguma dor de dente.	-----
. <u>Nao ter</u> dor devido a articulacao mandibular (localiza-se na face, na area anterior ao ouvido - ao abrir e fechar a boca fica facil senti-la com os dedos).	-----

Grupo numero 3:

. O quanto essa condicao e melhor, igual ou pior do que nao ter gengiva sangrando?

Condicoes	Valores
. <u>Nao ter</u> gengiva sangrando	500
. <u>Nao ter</u> impaccao alimentar (quando junta comida entre os dentes).	-----
. <u>Nao ter</u> mau-halito causado por algum problema na boca.	-----
. <u>Nao ter</u> dente mole.	-----
. <u>Nao ter</u> sensibilidade no dente quando come algo frio ou acido devido a retracao da gengiva (quando a gengiva sobe e fica uma parte da raiz exposta).	-----
. <u>Nao ter</u> preocupacao relacionada com o estado dos dentes.	-----
. Estar satisfeito com a gengiva.	-----

Grupo numero 4:

. O quanto essa condicao e melhor, igual ou pior do que nao ter o contacto com as pessoas (sair, jantar fora) afetado devido a algum problema com a aparencia dos dentes?

Condicoes	Valores
-----------	---------

. Naо ter o contacto com as pessoas (sair, jantar fora) afetado devido a algum problema com a aparencia dos dentes.

500

. Naо ter o contacto com as pessoas (sair, jantar fora) afetado devido a dor de dente.

-----

. Naо ter o contacto com as pessoas (sair, jantar fora) afetado devido algum problema com as funcoes gerais do dente como por exemplo falar, mastigar.

-----

. Naо ter a capacidade de trabalhar afetada devido a algum problema com a aparencia do dente.

-----

. Naо ter a capacidade de trabalhar afetada devido a dor de dente.

-----

Lembre-se:

.O quanto essa condicao e melhor, igual ou pior do que nao ter o contacto com as pessoas (sair, jantar fora) afetado devido a algum problema com a aparencia dos dentes?

Condicoes	Valores
. <u>Nao ter</u> o contacto com as pessoas (sair, jantar fora) afetado devido a algum problema com a <u>aparencia dos dentes</u> .	500
. <u>Nao ter</u> a capacidade de trabalhar afetada devido a algum problema com as funcoes gerais do dente como por exemplo falar, mastigar.	-----
. <u>Nao ter</u> a relacao amorosa afetada devido a algum problema com a <u>aparencia do dente</u> .	-----
. <u>Nao ter</u> a relacao amorosa afetada devido a <u>dor de dente</u> .	-----
. <u>Nao ter</u> a relacao amorosa afetada devido a algum problema com as <u>funcoes gerais do dente</u> , como por exemplo, falar, mastigar.	-----

Lembre-se:

. O quanto essa condicao e melhor, igual ou pior do que nao ter o contacto com as pessoas (sair, jantar fora) afetado devido a algum problema com a aparencia dos dentes?

Condicoes	Valores
. <u>Nao ter</u> o contacto com as pessoas (sair, jantar fora) afetado devido a algum problema com a <u>aparencia</u> <u>dos dentes</u>	500
. <u>Nao ficar</u> embaracado devido a algum problema com o dente (nao ficar sem graca devido ao dente).	-----
. <u>Nao evitar</u> sorrir devido a algum problema com o dente.	-----
. Estar satisfeito em mostrar os dentes quando sorri.	-----
. <u>Nao evitar</u> mostrar o dente quando conversa devido a algum problema com o dente.	-----
. Estar satisfeito em mostrar os dentes quando conversa.	-----
. <u>Nao dormir mal</u> devido a dor de dente.	-----
. <u>Nao ter</u> stress devido a dor de dente.	-----

Lembre-se:

.O quanto essa condicao e melhor, igual ou pior do que nao ter o contacto com as pessoas (sair, jantar fora) afetado devido a algum problema com a aparencia dos dentes?

Condicoes	Valores
. <u>Nao ter</u> o contacto com as pessoas (sair, jantar fora) afetado devido a algum problema com a <u>aparencia</u> <u>dos dentes</u>	500
. Ter capacidade de morder bem (isto e, tirar um pedaco com os dentes).	-----
. Estar satisfeito com a forma de morder.	-----
. Ter capacidade de mastigar bem.	-----
. Estar satisfeito com a capacidade de mastigar.	-----
. <u>Nao ter</u> que mudar comida devido aos dentes.	-----
. <u>Nao ter</u> que mudar forma de preparar a comida devido aos dentes.	-----
. <u>Nao ficar</u> inseguro devido a algum problema com os dentes.	-----

Segunda parte:

.O quanto essa condicao e mais importante, menos importante ou de igual importancia a aparencia do dentes?

Condicoes	Valores
.Aparencia dos dentes	500
. <u>Nao sentir</u> dor de dente	-----
. <u>Nao ter</u> desconforto ou sensacao desagradavel na boca (por exemplo sangramento, impaccao alimentar) -	
Desconforto oral e diferente de dor.	-----
. <u>Nao ter</u> a capacidade de fazer as funcoes diarias (por exemplo ir trabalhar, contacto com as pessoas, dormir, comer) afetada por nenhum problema com os dentes.	-----

Terceira parte:

(Agora voce julgara as perguntas juntas)

(E a ultima parte finalmente! So mais um pouco de paciencia.)

- O quanto esta condicao e melhor, igual ou pior do que nao ter dor de dente quando come ou bebe:

Condicoes	Valores
-----------	---------

• <u>Nao ter</u> dor de dente quando come ou bebe.	500
• <u>Nao ter</u> impaccao alimentar (quando junta comida entre os dentes).	-----
• <u>Nao ter</u> mau-halito.	-----
• <u>Nao ter</u> dente mole.	-----
• <u>Nao ter</u> sensibilidade no dente devido a retracao de gengiva (quando a gengiva sobe e uma parte do dente fica exposta).	-----
• <u>Nao ter</u> preocupacao relacionada com o estado dos dentes.	-----
• Estar satisfeito com a gengiva.	-----
• <u>Nao ter</u> dor de dente espontanea (quando o dente doi sozinho).	-----

Lembre-se:

- O quanto esta condicao e melhor, igual ou pior do que nao ter dor de dente quando come ou bebe:

Condicoes	Valores
• <u>Nao ter</u> dor de dente quando come ou bebe.	500
• <u>Nao ter</u> que mudar o tipo de comida devido a alguma dor de dente.	-----
• <u>Nao ter</u> dor devido a articulacao mandibular (localiza-se na face, na area anterior ao ouvido - ao abrir e fechar a boca fica facil senti-la com os dedos).	-----
• Estar satisfeito com a aparencia geral dos dentes.	-----
• Estar satisfeito com a cor dos dentes.	-----
• Estar satisfeito com os dentes no geral.	-----
• Estar satisfeito com a posicao dos dentes (se eles sao trepados ou nao).	-----

Lembre-se:

- O quanto esta condicao e melhor, igual ou pior do que nao ter dor de dente quando come ou bebe:

Condicoes	Valores
• <u>Nao ter</u> dor de dente quando come ou bebe.	500
• <u>Nao ter</u> o contacto com as pessoas (sair, jantar fora) afetado devido a algum problema com a <u>aparencia dos dentes</u> .	-----
• <u>Nao ter</u> o contacto com as pessoas (sair, jantar fora) afetado devido a <u>dor de dente</u> .	-----
• <u>Nao ter</u> o contacto com as pessoas (sair, jantar fora) afetado devido algum problema com as <u>funcoes gerais do dente como por exemplo falar, mastigar</u> .	-----
• <u>Nao ter</u> a capacidade de trabalhar afetada devido a algum problema com a <u>aparencia do dente</u> .	-----

Lembre-se:

- O quanto esta condicao e melhor, igual ou pior do que nao ter dor de dente quando come ou bebe:

Condicoes	Valores
• <u>Naot ter</u> dor de dente quando come ou bebe.	500
• <u>Naot ter</u> a capacidade de trabalhar afetada devido a <u>dor de dente</u> .	-----
• <u>Naot ter</u> a capacidade de trabalhar afetada devido a algum problema com as funcoes gerais do dente como por exemplo falar, mastigar.	-----
• <u>Naot ter</u> a relacao amorosa afetada devido a algum problema com a <u>aparencia do dente</u> .	-----
• <u>Naot ter</u> a relacao amorosa afetada devido a <u>dor de dente</u> .	-----
• <u>Naot ter</u> a relacao amorosa afetada devido a algum problema com as <u>funcoes gerais do dente</u> , como por exemplo, falar, mastigar.	-----
• <u>Naot ficar</u> embaracado devido a algum problema com o dente (nao ficar sem graca devido ao dente).	-----

Lembre-se:

- O quanto esta condicao e melhor, igual ou pior do que nao ter dor de dente quando come ou bebe:

Condicoes	Valores
• <u>Nao ter</u> dor de dente quando come ou bebe.	500
• <u>Nao evitar</u> sorrir devido a algum problema com o dente.	-----
• Estar satisfeito em mostrar os dentes quando sorri.	-----
• <u>Nao evitar</u> mostrar o dente quando conversa devido a algum problema com o dente.	-----
• Estar satisfeito em mostrar os dentes quando conversa.	-----
• <u>Nao dormir mal</u> devido a dor de dente.	-----
• <u>Nao ter</u> stress devido a dor de dente.	-----
• Ter capacidade de morder bem (isto e, tirar um pedaco com os dentes).	-----
• Estar satisfeito com a forma de morder.	-----
• Ter capacidade de mastigar bem.	-----

Lembre-se:

- O quanto esta condicao e melhor, igual ou pior do que nao ter dor de dente quando come ou bebe:

Condicoes	Valores
• <u>Nao ter</u> dor de dente quando come ou bebe.	500
• Estar satisfeito com a capacidade de mastigar.	-----
• <u>Nao ter</u> que mudar comida devido aos dentes.	-----
• <u>Nao ter</u> que mudar forma de preparar a comida devido aos dentes.	-----
• <u>Nao ficar</u> inseguro devido a algum problema com os dentes.	-----

Muitissimo obrigada. Agora eu so gostaria de saber:

- Nome: -----
- Idade: -----
- Sexo: -----
- Profissao atual: -----
- Escolaridade: -----
- Endereco e telefone para contacto: -----

Gostaria tambem de saber se voce sofreu ou sofre alguma das condicoes abaixo, marcando a letra correspondente:

1- Dor de dente:

- a- Teve ha mais de tres meses
- b- Teve nos ultimos tres meses
- c- Nunca teve
- d- NRA (Nenhuma das respostas acima)

2- Insatisfacao com a aparencia dos dentes:

- a- Teve ha mais do que tres meses
- b- Teve nos ultimos tres meses
- c- Nunca teve
- d- NRA

3- Insatisfaco com a gengiva:

- a- Teve ha mais do que tres meses
- b- Teve nos ultimos tres meses
- c- Nunca teve
- d- NRA

Muito obrigada

Anna Thereza Thome Leao  
66-72 Gower Street  
WC1 6EA London UK

Londres, outubro de 1991.

Prezado(a) colega,

Estou fazendo doutorado em Saude Publica em Odontologia na UCL.

Minha pesquisa e sobre saude oral e como uma etapa fundamental do trabalho preciso de respostas para o questionario em anexo.

Necessito extremamente de sua ajuda para tal. Para responder voce gastara em media de 10 a 15 minutos.

Em agradecimento e reconhecimento a sua colaboracao, sortearei duas entradas para um show entre as pessoas que responderem ao questionario (show este que sera escolhido entre tres opcoes dadas pelo sorteado).

Para facilitar a organizacao da pesquisa e do sorteio, gostaria que sua resposta fosse retornada nas primeiras duas semanas apos o recebimento do mesmo. Para que isso seja facilitado, segue em anexo um envelope selado com meu nome e endereço.

Muito obrigada,

Anna Thereza Thome Leao

PS: Meu telefone de contacto:

Residencia (071) 6025638

Departamento (071) 3877050 - ext 5726

## Questionnaire (English version)

This study is being carried out to measure the impact oral health on people's lives.

Using a questionnaire I have asked a group of people to rank in relative importance some items about oral health. There are no right or wrong answers. No names or answers that could lead to respondents will be published. This survey is confidential.

I should like to know if you would kindly participate in the study, completing the scales according to the following example:

### Instructions:

Example: 'air pollution' has the arbitrary value of 500. Read the other items to be compared and consider how much each of them is worse than, better than or equal to 'air pollution'. If you think that the item is better, choose a value proportionally higher and write it on the dotted line after the item, in the column marked 'values'. If you decide that the item is worse, write a number proportionally lower, in the dotted line which is after the item in the column 'values'. If the item has an equal value to 'air pollution', mark '500' (as marked for 'air pollution') on the dotted line after the item, in the column marked 'values'.

Items	Values
Air pollution	500
Water pollution	-----
(Water pollution is worse than, better than or has the same value as air pollution? It is worse. How much worse than 500?)	
Sound pollution	-----
(Sound pollution is worse than, better than or has the same value as air pollution? It has the same value. Then it has the value 500.)	
Visual pollution	-----
(Visual pollution is worse than, better than or has the same value as air pollution? It is better. How much better than 500?)	

Thank you for your help,

## Answer

Note: You don't have to have the conditions asked below. To evaluate items, imagine the conditions described and judge if you consider them better equal or worse than the one worth 500.

### Group 1:

- How much is this condition better than, worse than or equal to satisfaction with general appearance of teeth?

Conditions	Values
• Satisfied, on the whole, with the appearance of teeth.	500
• Satisfied with the colour of the teeth.	-----
• Satisfied, on the whole, with your teeth.	-----
Satisfied with the position of your teeth (if they are crooked or not).	-----

Group 2:

How much is this condition better than, worse than or equal to  
not having toothache when you eat or drink?

Conditions	Values
. <u>Not having</u> toothache when you eat or drink.	500
. <u>Not having</u> spontaneous toothache (when you feel toothache without any specific cause)	-----
. <u>Not having</u> to change the type of your food because of toothache.	-----
. <u>Not having</u> any pain in your jaw joint (located on the face, in the area in front of the ears - when you open and close the mouth it is easy to feel the jaw joint with your fingers).	-----

Group 3:

- How much is this condition better than, worse than or equal to not having bleeding gums?

Conditions	Values
. <u>Not having</u> bleeding gums	500
. <u>Not having</u> food getting stuck between your teeth	-----
. <u>Not having</u> bad breath caused by any problems in your mouth	-----
. <u>Not having</u> loose teeth.	-----
. <u>Not having</u> any sensitivity when eating or drinking anything cold or acidic because your gums are retracted (that is, when part of the tooth root is exposed).	-----
. <u>Not worrying about</u> anything related to the teeth status.	-----
. <u>Satisfied with</u> the gums	-----

Group 4:

. How much is this condition better than, worse than or equal to not having your contact with people affected because of any problem with the appearance of your teeth?

Conditions	Values
------------	--------

. Not having your contact with people affected because of any problem with the appearance of your teeth. 500

. Not having your contact with people affected because of toothache. -----

. Not having your contact with people affected because of any problem with the function of your teeth (like eating, talking). -----

. Not having your working capacity affected because of any problem with the appearance of your teeth. -----

. Not having your working capacity affected because of any toothache. -----

. Not having your working capacity affected because of any problem with the function of your teeth (like eating, talking). -----

Remember:

- How much is this condition better than, worse than or equal to not having your contact with people affected because of any problem with the appearance of your teeth?

Conditions	Values
------------	--------

- Not having your contact with people affected because of any problem with the appearance of your teeth. 500
- Not having your romantic life affected because of any problem with the appearance of your teeth. -----
- Not having your romantic life affected because of toothache. -----
- Not having your romantic life affected because of any problem with the function of your teeth (like eating, talking). -----
- Not having any embarrassment caused by any problem with your teeth. -----
- Not avoiding smiling because of any problem with your teeth. -----
- Being satisfied in showing the teeth when smiling. -----
- Not avoiding showing your teeth when you talk because of any problem with them. -----

Remember:

- . How much is this condition better than, worse than or equal to not having your contact with people affected because of any problem with the appearance of your teeth?

Conditions	Values
. <u>Not having</u> your contact with people affected because of any problem with the appearance of your teeth.	500
. <u>Being</u> satisfied in showing the teeth when talking.	-----
. <u>Not having</u> your sleep affected because of toothache	-----
. <u>Not having</u> stress because of toothache	-----
. <u>Being able</u> to chew your food without any problems caused by your teeth	-----
. <u>Feeling</u> satisfied with your chewing	-----
. <u>Being able</u> to bite your food without any problems caused by the teeth	-----
. <u>Feeling</u> satisfied with your biting	-----
. <u>Not having</u> to change your food because any matter with your teeth	-----

Remember:

- How much is this condition better than, worse than or equal to not having your contact with people affected because of any problem with the appearance of your teeth?

Conditions	Values
<ul style="list-style-type: none"><li>• <u>Not having</u> your contact with people affected because of any problem with the appearance of your teeth.</li></ul>	500
<ul style="list-style-type: none"><li><u>Not having</u> to change the way you prepare your food because any matter with your teeth</li></ul>	-----
<ul style="list-style-type: none"><li><u>Not feeling</u> insecure because of any problem with your teeth</li></ul>	-----

Second part:

. How much is this condition better than, worse than or equal to appearance of the teeth?

Conditions	Values
. Appearance of the teeth	500
. <u>Not having</u> oral pain	-----
. <u>Not having</u> discomfort and/ or any unpleasant status caused by any problem in the mouth (for example, bleeding gums, packing food). Mouth comfort is not the same as pain	-----
. <u>Not having</u> the ability to carry out daily activity functions (work, sleep, eat, contact with people) affected by any problem with the teeth	-----

Third part (this is the last part):

All questions will be included in this group.

. How much is this condition better than, worse than or equal to not having toothache when you eat or drink?

Conditions	Values
------------	--------

. Not having toothache when  
you eat or drink. 500

. Not having spontaneous toothache  
(when you feel toothache without  
any specific cause) -----

. Not having to change the type of  
your food because of toothache. -----

. Not having any pain in your jaw  
joint (located on the face, in the  
area in front of the ears - when  
you open and close the mouth it  
is easy to feel the jaw joint with  
your fingers). -----

. Satisfied, on the whole,  
with the appearance of teeth. -----

. Satisfied with the colour  
of the teeth. -----

. Satisfied, on the whole,  
with your teeth. -----

  Satisfied with the position  
of your teeth (if they are crooked  
or not). -----

. Not having bleeding gums -----

Remember:

- How much is this condition better than, worse than or equal to not having toothache when you eat or drink?

Conditions	Values
• <u>Not having</u> toothache when you eat or drink.	500
• <u>Not having</u> food getting stuck between your teeth	-----
• <u>Not having</u> bad breath caused by any problems in your mouth	-----
• <u>Not having</u> loose teeth.	-----
• <u>Not having</u> any sensitivity when eating or drinking anything cold or acidic because your gums are retracted (that is, when part of the tooth root is exposed).	-----
• <u>Not worrying about</u> anything related to the teeth status.	-----
• <u>Satisfied with</u> the gums	-----
• <u>Not having</u> your contact with people affected because of any problem with the appearance of your teeth.	-----
• <u>Not having</u> your contact with people affected because of toothache.	-----

Remember:

- How much is this condition better than, worse than or equal to not having toothache when you eat or drink?

Conditions	Values
• <u>Not having</u> toothache when you eat or drink.	500
• <u>Not having</u> your contact with people affected because of any problem with the function of your teeth (like eating, talking).	-----
• <u>Not having</u> your working capacity affected because of any problem with the appearance of your teeth.	-----
• <u>Not having</u> your working capacity affected because of toothache.	-----
• <u>Not having</u> your working capacity affected because of any problem with the function of your teeth (like eating, talking).	-----
• <u>Not having</u> your romantic life affected because of any problem with the appearance of your teeth.	-----
• <u>Not having</u> your romantic life affected because of toothache.	-----

Remember:

- How much is this condition better than, worse than or equal to not having toothache when you eat or drink?

Conditions	Values
• <u>Not having</u> toothache when you eat or drink.	500
• <u>Not having</u> your romantic life affected because of any problem with the function of your teeth (like eating, talking).	-----
• <u>Not having</u> any embarrassment caused by any problem with your teeth.	-----
• <u>Not avoiding</u> smiling because of any problem with your teeth.	-----
• <u>Being</u> satisfied in showing the teeth when smiling.	-----
• <u>Not avoiding</u> showing your teeth when you talk because of any problem with them.	-----
• <u>Being</u> satisfied in showing the teeth when talking.	-----
• <u>Not having</u> your sleep affected because of toothache	-----
• <u>Not having</u> stress because of toothache	-----

Remember:

- How much is this condition better than, worse than or equal to not having toothache when you eat or drink?

Conditions	Values
• <u>Not having</u> toothache when you eat or drink.	500
• <u>Being able</u> to chew your food without any problems caused by your teeth	-----
• <u>Feeling</u> satisfied with your chewing	-----
• <u>Being able</u> to bite your food without any problems caused by the teeth	-----
• <u>Feeling</u> satisfied with your biting	-----
• <u>Not having</u> to change your food because any matter with your teeth	-----
• <u>Not having</u> to change the way you prepare your food because any matter with your teeth	-----
• <u>Not feeling</u> insecure because of any problem with your teeth	-----

Thank you very much. Now, I should like to have some personal information:

- . Name: -----
- . Age: -----
- . Sex: -----
- . Profession: -----
- . Education: -----
- . Address and phone number for contact: -----

Please mark the corresponding letter:

. I should like to know if you had or if have any of the following conditions:

1. Tooth ache:
  - a. Had, but not in the last three months
  - b. Had, in the last three months
  - c. Never had
  - d. None of the above answers
2. Dissatisfied with appearance of your teeth:
  - a. I was dissatisfied with the appearance of my teeth, but not in the last three months.
  - b. I was dissatisfied with the appearance of my teeth, in the last three months.
  - c. I have never been dissatisfied with the appearance of my teeth
  - d. None of the above answers

3. Dissatisfied with gums:

- a. I was dissatisfied with my gums, but not in the last three months.
- b. I was dissatisfied with my gums, in the last three months.
- c. I have never been dissatisfied with my gums
- d. None of the above answers

Anna Thereza Thome Leao

66-72 Gower Street

WC1 6EA London UK

London, October 1991.

Dear friend,

I am doing a PhD in Dental Public Health at UCL.

My research is about oral health and an important part of the study is to obtain answers for the enclosed questionnaire.

I need your help in answering it. You will need to spend on average from 10 to 15 minutes.

By way of thanks for your time and help, I propose to raffle two tickets for a show among those answering the questionnaire. (The show will be chosen from among three suggestions given by the winner).

To make things easier for me, I should like to know, if you can return your answer within the first two weeks of receiving this questionnaire. I am enclosing a stamped addressed envelope.

Thank you,

Anna Thereza Thome Leao

PS: My phone number is: Home (071) 6025638

Department (071) 3977050 - ext 5726

## APPENDIX 10

### WEIGHTING ITEMS

Items were coded in three scores: positive '1', fair '0' and negative '-1'. To sum those items to obtain a final score for each dimension, three different approaches were used:

- to consider questions having equal weight,
- to weight questions through factor analysis
- to weight questions through a magnitude scale, applied in a different sample, of the same nationality (Chapter 'Complementary study').

#### 1. Questions having equal weight

In this approach, questions have been added in each dimension, according to their coding.

#### 2. Through factor analysis

In this approach, the factor loading and factor score, have been used as a weight, and then questions within each dimension have been added.

#### 3. Through a magnitude scale

In this approach, the arithmetic mean obtained by the magnitude scale for each question has been used as the weight, and then questions have been added.

#### 10.1. Comparing the three results

After achieving the scores of the dimensions we have done a Pearson correlation between them (Table AP10.1, AP10.2, AP10.3, AP10.4).

Table AP10.1. Correlation of total score of appearance dimension when items received equal weight, factor loading weight and weight from a magnitude scale.

	without weight	weighted by magnit. scale	weighted by factor load	weighted by factor score
without weight	1.0000			
weighted by the magnitude scale	.9712**	1.0000		
weighted by factor load	.9934**	.9890**	1.0000	
weighted by factor score	.9953**	.9872**	.9998**	1.0000

\*\* P< 0.001

Table AP10.2. Correlation of total score of pain dimension when items received equal weight, factor loading weight and weight from a magnitude scale.

	without weight	weighted by magnit. scale	weighted by factor load	weighted by factor score
without weight	1.0000			
weighted by the magnitude scale	.9925**	1.0000		
weighted by factor load	.9754**	.9815**	1.0000	
weighted by factor score	.9865**	.9947**	.9954**	1.0000

\*\* P< 0.001

Table AP10.3. Correlation of total score of performance dimension when items received equal weight, factor loading weight and weight from a magnitude scale.

	without weight	weighted by weight	weighted by magnit. scale	factor load	weighted by factor score
without weight	1.0000				
weighted by the magnitude scale		.9926**	1.0000		
weighted by factor load		.9529**		.9407**	1.0000
weighted by factor score		.9550**		.9499**	
					.9959**
					1.0000

\*\* P< 0.001

Table AP10.4. Correlation of total score of comfort dimension when items received equal weight, factor loading weight and weight from a magnitude scale.

	without weight	weighted by weight	weighted by magnit. scale	factor load	weighted by factor score
without weight	1.0000				
weighted by the magnitude scale		.9803**	1.0000		
weighted by factor load		.9564**		.9412**	1.0000
weighted by factor score		.9352**		.9194**	
					.9952**
					1.0000

\*\* P< 0.001

## APPENDIX 11

### FACTOR ANALYSIS

Factor analysis was done to test the grouping of items. Items which had factor loads above 0.3 (Spanier, 1980) were included in the dimensions. Before conducting factor analysis a Spearman correlation was done, since the data was ordinal.

The following tables present the factor loads for items included within each dimension.

Table AP11.1. List of items included in each dimension and their respective factor loadings.

Items	Factor loading
Appearance dimension	
Satisfaction with teeth	.6889
Satisfaction with appearance of teeth	.7532
Satisfaction with colour of teeth	.7162
Satisfaction with position of teeth	.4692
Pain dimension	
Spontaneous pain	.7277
Changing food because of pain	.4882
Pain when eating / hot or cold	.4603
Working capacity affected by pain	.7743
Stress because of pain	.6958
Bad sleeping because of pain	.7418
Comfort dimension	
Halitosis	.4135
Bleeding gums	.6565
Food packing	.5577
Loose teeth	.3012
Satisfaction with gums	.4526
Sensitivity because of gingival recession	.5881
Worry about teeth, prosthesis or denture	.3746
Performance dimension	
Working capacity affected by appearance of teeth	.5943
Working capacity affected by eating, talking	.5877
Contact with people affected by appearance of teeth	.7148
Contact with people affected by eating, talking	.6833
Contact with people affected by pain	.3602
Romance affected by pain	.3404
Romance affected by eating, talking	.6699
Self-confidence affected by teeth	.4280
Embarrassment caused by teeth	.4406
Romance affected by appearance of teeth	.6712
Avoid showing teeth when smiling	.5053
Satisfaction with smile	.5122
Fifth dimension	
Capacity to chew	.6887
Satisfaction with chewing	.7411
Capacity to bite	.7479
Satisfaction with biting	.7774
Sixth dimension	
Changing way of preparing food	.7807
Changing types of food because of gums	.6154
Changing types of food because of teeth	.6979

Table AP11.2. List of extra-items for those who wore a partial prosthesis included in each dimension and their respective factor loadings.

Items	Factor loadings
<b>Appearance dimension</b>	
Satisfaction with prosthesis	.6041
Satisfaction with appearance of prosthesis	.6959
Satisfaction with colour of prosthesis	.6009
<b>Eating Restriction dimension</b>	
Pain because of prosthesis	.4169
Changing types of food because of prosthesis	.7598

Table AP11.3. List of extra-items for those who wore a denture included in each dimension and their respective factor loadings.

Items	Factor loadings
<b>Appearance dimension</b>	
Satisfaction with denture	.6268
Satisfaction with appearance of denture	.7042
Satisfaction with colour of denture	.6374
<b>Comfort dimension</b>	
Difficulty talking because of denture	.4789
Pain because of denture	.4594
<b>Eating restriction dimension</b>	
Feeling of a full mouth because of denture	.6991
Changing flavour of food because of denture	.4201

## APPENDIX 12

### CONSTRUCT VALIDITY

To test the construct validity different distributions of scores in each dimension according to oral status have been checked. It is assumed that those who presented a better oral status might present a higher (more positive) and significantly different distribution of dimensions scores. Because a parametric test would not be appropriate for ordinal data, the Kruskal-Wallis test one-way analysis of variance was conducted (Norusis, 1990). This test has been conducted on the sample of those who did not wear a prosthesis (n=465), therefore missing teeth would mean a toothless space. The following tables show that there was a significantly ( $p<0.05$ ) different distribution between scores of the instrument when groups of different oral status were compared. The mean scores of dimensions in each group of oral status are presented.

Table AP12.1. Mean scores of appearance and performance dimension for those who presented filled and/or sound anterior teeth and those who presented decayed and/or missing teeth.

	Appearance dimension		Performance dimension	
	Mean	(SD)	Mean	(SD)
Sound and/or filled anterior teeth	.66	.48	.93	.13
Decayed and/or missing anterior teeth	.11	.60	.68	.37

\*= p< 0.01 \*\*= p< 0.0001

Table AP12.2 Mean scores of pain and performance dimension for those who presented decayed teeth and those who did not present decayed teeth.

	Pain dimension		Performance dimension	
	Mean	(SD)	Mean	(SD)
No decayed teeth	.82	.32	.92	.16
One or more decayed teeth	.69	.39	.76	.33

\*= p< 0.01 \*\*= p< 0.0001

Table AP12.3. Mean scores of comfort dimension for those who presented bleeding gum and those who did not present bleeding gum, for those who presented calculus and those who did not present calculus and for those who presented pocket and those who did not present pocket.

Comfort dimension		
	Mean	(SD)
No bleeding gum	** .64	.28
Bleeding gum	.51	.34
No calculus	** .68	.29
Calculus	.54	.32
No pocket	** .61	.29
Pocket	.32	.39

\*= p< 0.01 \*\*= p< 0.0001

## APPENDIX 13

### CLINICAL CHARACTERISTICS OF THE SAMPLE

The sample was grouped according to gender, DMFT levels and social class. Additionally, it was divided into three groups: those who did not wear a partial prosthesis, those who did wear a partial prosthesis and those who wore a full upper denture. Mean scores of number of decayed, filled and missing teeth and periodontal status were calculated for the total sample and for each of the above groups classified according to whether respondents wore prosthesis or not. In addition Kruskal-Wallis test one-way anova was done to assess if the distribution of these oral statuses were significantly different or not between social class groups, sexes and DMFT level groups. These scores are reported in the following tables.

Table AP13.1. Clinical characteristics of the sample: mean number of decayed, filled and missing teeth.

	n	Decayed teeth	Filled teeth	Missing teeth
All	662	1.3(2.3)	7.3(6.1)	7.1(7.1)
Gender				
Male	359	1.5(2.4)	7.5(6.1)	6.8(6.9)
Female	303	1.0(1.9)	7.0(6.0)	7.4(7.4)
Social class				
High	304	0.6(1.2)	11.3(5.1)	2.7(3.2)
Low	358	1.9(2.7)	3.9(4.6)	10.8(7.3)
DMFT				
High	271	1.6(2.5)	8.0(7.3)	12.1(7.8)
Medium	209	1.4(2.3)	9.3(5.0)	4.7(4.0)
Low	182	0.7(1.5)	4.0(3.3)	2.4(2.8) *

\*= p< 0.05 \*\*= p< 0.01 \*\*\*= p< 0.0001 ns= non-significant

Table AP13.2. Clinical characteristics of the sample: periodontal status - mean number of teeth with bleeding gums, calculus and pocket.

	n	Bleeding	Calculus	Pocket
All	662	3.2(4.3)	5.3(5.0)	0.4(1.5)
Gender				
Male	359	3.6(4.5)	6.1(5.3)	0.5(1.5)
Female	303	2.7(4.0)	4.4(4.6)	0.4(1.5)
Social class				
High	277	2.1(3.8)	4.0(4.4)	0.3(1.4)
Low	188	4.1(4.5)	6.4(5.3)	0.6(1.6)
DMFT				
High	121	2.8(3.7)	4.6(4.0)	0.5(1.5)
Medium	172	3.0(4.6)	5.5(5.1)	0.3(1.3)
Low	172	3.8(4.8)	6.0(6.0)	0.5(1.8)

\*= p< 0.05 \*\*= p< 0.01 \*\*\*= p< 0.0001 ns= non-significant

Table AP13.3. Clinical characteristics of the sample: mean number of decayed, filled and missing teeth for those who do not wear a prosthesis.

	n	Decayed teeth	Filled teeth	Missing teeth
All	465	1.2(2.4)	8.8(6.1)	3.6(3.8)
Gender				
Male	256	ns	ns	ns
Female	209	1.0(2.1)	8.6(6.1)	3.5(4.0)
Social class		***	***	***
High	277	0.5(1.1)	11.4(5.2)	2.1(2.6)
Low	188	2.2(3.2)	4.9(5.2)	5.8(4.3)
DMFT		***	***	***
High	121	1.9(3.2)	13.7(6.1)	5.4(4.7)
Medium	172	1.4(2.4)	10.0(5.0)	3.8(3.6)
Low	172	0.6(1.4)	4.2(3.2)	2.1(2.6)

\*= p< 0.05   \*\*= p< 0.01   \*\*\*= p< 0.0001   ns= non-significant

Table AP13.4. Clinical characteristics of the sample:  
periodontal status - mean number of teeth with bleeding gums,  
calculus and pocket for those who do not wear a prosthesis.

	n	Bleeding	Calculus	Pocket
All	465	3.2(4.6)	5.4(5.3)	0.4(1.6)
Gender		*	**	ns
Male	256	3.6(4.8)	6.2(5.5)	0.5(1.7)
Female	209	2.7(4.3)	4.4(5.0)	0.4(1.5)
Social class		***	***	*
High	277	2.1(3.8)	4.0(4.5)	0.3(1.5)
Low	188	4.9(5.1)	7.5(5.7)	0.6(1.9)
DMFT		ns	ns	ns
High	121	2.7(4.1)	4.5(4.3)	0.5(1.7)
Medium	172	3.1(4.8)	5.6(5.3)	0.3(1.4)
Low	172	3.7(4.7)	5.8(5.9)	0.4(1.8)

\* = p < 0.05   \*\* = p < 0.01   \*\*\* = p < 0.0001   ns = non-significant

Table AP13.5. Clinical characteristics of the sample : mean number of decayed, filled and missing teeth for those who wear a partial prosthesis.

	n	Decayed teeth	Filled teeth	Missing teeth
All	106	1.6(1.9)	6.0(4.6)	10.7(4.8)
Gender				
Male	58	2.0(2.0)	6.4(4.8)	9.8(4.4)
Female	48	1.2(1.7)	5.5(4.4)	11.8(5.2)
Social class				
High	27	1.1(1.5)	9.5(3.8)	8.1(4.2)
Low	79	1.8(2.0)	4.8(4.2)	11.6(4.7)
DMFT				
High	59	1.9(1.9)	6.7(4.8)	12.7(4.9)
Medium	37	1.3(1.7)	6.3(3.8)	8.7(3.6)
Low	10	1.6(2.5)	0.7(1.0)	6.6(2.4)

\*= p< 0.05   \*\*= p< 0.01   \*\*\*= p< 0.0001   ns= non-significant

Table AP13.6. Clinical characteristics of the sample: periodontal status - mean number of teeth with bleeding gums, calculus and pocket for those who wear a partial prosthesis.

	n	Bleeding	Calculus	Pocket
All	106	5.6(4.9)	5.6(4.9)	0.5(1.2)
Gender				
		ns	*	*
Male	58	3.7(4.3)	6.6(5.5)	0.2(0.6)
Female	48	2.4(3.6)	4.3(3.8)	0.8(1.6)
Social class				
		*	ns	ns
High	27	1.8(3.3)	4.0(3.5)	0.1(0.4)
Low	79	3.6(4.2)	6.1(5.2)	0.6(1.3)
DMFT				
		ns	ns	ns
High	59	2.8(5.7)	5.1(4.7)	0.6(1.4)
Medium	37	2.6(3.3)	5.2(4.1)	0.2(.63)
Low	10	2.8(3.9)	9.5(7.3)	0.7(1.2)

\*= p< 0.05 \*\*= p< 0.01 \*\*\*= p< 0.0001 ns= non-significant

Table AP13.7. Clinical characteristics of the sample: mean number of decayed, filled and missing teeth for those who wear a full upper denture (n=91).

	n	Decayed teeth	Filled teeth	Missing teeth
All	91	1.2(1.4)	1.1(1.6)	20.5(2.6)
Gender				
		**	ns	ns
Male	45	1.6(1.7)	0.9(1.5)	20.9(2.9)
Female	46	0.7(1.0)	1.4(1.6)	20.2(2.1)

\*= p< 0.05 \*\*= p< 0.01 \*\*\*= p< 0.0001 ns= non-significant

Table AP13.8. Clinical characteristics of the sample:  
 periodontal status - mean number of teeth with bleeding gums,  
 calculus and pocket for those who wear a full upper denture.

	n	Bleeding	Calculus	Pocket
All	91	2.8(3.0)	4.3(3.1)	0.5(1.1)
Gender				
		ns	ns	ns
Male	45	3.0(3.1)	4.5(3.1)	0.5(1.1)
Female	46	2.6(3.0)	4.1(3.1)	0.4(1.1)

\*= p< 0.05 \*\*= p< 0.01 \*\*\*= p< 0.0001 ns= non-significant

## APPENDIX 14

### RESULTS OF DATA COLLECTED: PSYCHOSOCIAL IMPACT AND GROUPS OF SATISFACTION

Items were summed into a total score for each dimension and according to these scores respondents were grouped. These groups were divided: satisfied (scores from 0.7 to 1), relatively satisfied (scores from 0 to 6.9) and unsatisfied (scores below 0) with the category. Results for each dimension and the total score of the questionnaire were analysed according to gender, social class groups and different DMFT level groups for the total sample, for those who did not wear a prosthesis, for those who wore a partial prosthesis and for those who wore a full upper denture. Kruskal-Wallis one-way anova test was used to find if there were significantly different distributions of dimension scores between sexes, social class groups and different DMFT level groups.

Table AP14.1. Subjective impact on appearance dimension of the sample: Number of subjects who are satisfied (S), relatively satisfied (RS) and unsatisfied (US) with appearance for those who do not wear a prosthesis, those who wear a partial prosthesis and those who wear full denture.

All subjects (n=662)				Subjects who do not wear a prosthesis (n=465)			Subjects who wear a partial prosthesis (n=106)			Subjects who wear full denture (n=91)			
	S	RS	US	S	RS	US	S	RS	US	S	RS	US	
<b>Gender</b>													
			ns			ns			ns			ns	
Male	n	188	83	88	137	56	63	25	18	15	26	09	10
	%	52%	23%	25%	53%	22%	25%	43%	31%	26%	58%	20%	22%
Female	n	150	88	63	112	52	45	18	19	11	20	19	07
	%	50%	29%	21%	54%	25%	21%	37%	40%	23%	44%	41%	15%
<b>Social class</b>													
			***			***			ns				
High	n	186	70	48	177	61	39	09	09	09	---		
	%	61%	23%	16%	64%	22%	14%	33%	33%	33%	---		
Low	n	152	103	103	72	47	69	34	28	17	46	28	17
	%	42%	29%	29%	38%	25%	37%	43%	35%	21%	50%	31%	19%
<b>DMFT</b>													
			***			***			ns				
High	n	106	79	85	40	31	50	20	21	18	46	28	17
	%	40%	29%	31%	33%	26%	41%	34%	36%	30%	50%	31%	19%
Medium	n	106	60	43	87	46	39	19	14	04	----		
	%	51%	29%	20%	50%	27%	23%	51%	38%	11%			
Low	n	126	33	23	122	31	19	04	02	04	----		
	%	69%	18%	13%	71%	18%	11%	40%	20%	40%			

\*= p< 0.05 \*\*= p< 0.01 \*\*\*= p< 0.0001 ns= non-significant

Table AP14.2. Subjective impact on performance dimension of the sample: Number of subjects who are satisfied (S), relatively satisfied (RS) and unsatisfied (US) with performance for those who do not wear a prosthesis, those who wear a partial prosthesis and those who wear full denture.

		All subjects (n=662)			Subjects who do not wear a prosthesis (n=465)			Subjects who wear a partial prosthesis (n=106)			Subjects who wear full denture (n=91)		
		S	RS	US	S	RS	US	S	RS	US	S	RS	US
<b>Gender</b>													
					ns		ns			ns			ns
Male	n	292	63	04	217	37	02	40	17	01	35	09	01
	%	81%	18%	01%	85%	14%	01%	70%	29%	01%	78%	20%	02%
Female	n	244	48	11	175	25	09	33	13	02	36	10	00
	%	80%	16%	04%	84%	12%	04%	69%	27%	04%	78%	22%	00%
<b>Social class</b>													
					***		***			ns			
High	n	282	21	01	261	15	01	21	06	00			---
	%	93%	7%	.3%	94%	05%	.4%	78%	22%	00%			
Low	n	229	99	30	131	47	10	52	24	03	71	19	01
	%	64%	28%	08%	70%	25%	05%	66%	30%	04%	78%	21%	01%
<b>DMFT</b>													
					***		***			ns			
High	n	195	68	03	88	28	00	36	21	02	71	19	01
	%	72%	26%	3%	73%	23%	00%	61%	36%	03%	78%	21%	01%
Medium	n	177	26	06	148	18	06	29	08	00	-----		
	%	85%	12%	3%	86%	10%	04%	78%	22%	00%			
Low	n	164	17	01	156	16	00	08	01	01	-----		
	%	90%	09%	01%	91%	09%	00%	80%	10%	10%			

\*= p< 0.05 \*\*= p< 0.01 \*\*\*= p< 0.0001 ns= non-significant

Table AP14.3. Subjective impact on comfort dimension of the sample: Number of subjects who are satisfied (S), relatively satisfied (RS) and unsatisfied (US) with comfort for those who do not wear a prosthesis, those who wear a partial prosthesis and those who wear a full denture.

All subjects (n=662)			Subjects who do not wear a prosthesis (n=465)			Subjects who wear a partial prosthesis (n=106)			Subjects who wear full denture (n=91)			
	S	RS	US	S	RS	US	S	RS	US	S	RS	US
<b>Gender</b>												
			*			ns			ns			ns
Male	n	179	151	29	120	114	22	30	22	06	29	15
	%	50%	42%	08%	47%	44%	09%	52%	38%	10%	65%	33%
Female	n	155	132	16	110	87	12	25	20	03	20	15
	%	51%	44%	05%	53%	41%	06%	52%	42%	06%	44%	54%
<b>Social class</b>												
			ns			ns			ns			---
High	n	144	142	18	131	130	16	13	12	02		
	%	47%	47%	06%	47%	47%	06%	48%	45%	07%		
Low	n	190	141	27	99	71	18	42	30	07	49	30
	%	53%	40%	07%	53%	38%	09%	53%	38%	09%	54%	44%
<b>DMFT</b>												
			***			***			ns			
High	n	118	130	23	43	64	14	26	26	07	49	30
	%	44%	48%	08%	35%	53%	12%	44%	44%	12%	54%	44%
Medium	n	99	91	19	77	78	17	22	13	02		----
	%	47%	44%	09%	45%	45%	10%	59%	35%	05%		
Low	n	117	62	03	110	59	03	07	03	00		----
	%	64%	34%	02%	64%	34%	2%	70%	30%	00%		

\*= p< 0.05 \*\*= p< 0.01 \*\*\*= p< 0.0001 ns= non-significant

Table AP14.4. Subjective impact on pain dimension of the sample: Number of subjects who are satisfied (S), relatively satisfied (RS) and unsatisfied (US) with pain for those who do not wear a prosthesis, those who wear a partial prosthesis and those who wear full denture.

		All subjects (n=662)			Subjects who do not wear a prosthesis (n=465)			Subjects who wear a partial prosthesis (n=106)			Subjects who wear full denture (n=91)		
		S	RS	US	S	RS	US	S	RS	US	S	RS	US
<b>Gender</b>													
Male	n	239	93	27	177	78	21	34	19	05	28	16	01
	%	66%	26%	08%	69%	23%	08%	58%	33%	09%	62%	36%	02%
Female	n	190	82	31	140	45	24	26	17	05	24	20	02
	%	63%	27%	10%	67%	21%	12%	54%	35%	10%	52%	43%	04%
<b>Social class</b>													
High	n	219	61	24	201	56	20	18	05	04	---		
	%	72%	20%	08%	73%	20%	07%	67%	18%	15%			
Low	n	210	114	34	116	47	25	42	31	06	52	36	03
	%	59%	32%	09%	62%	25%	13%	53%	39%	08%	57%	40%	03%
<b>DMFT</b>													
High	n	155	90	26	71	33	17	32	21	06	52	36	03
	%	57%	33%	10%	59%	27%	14%	54%	36%	10%	57%	40%	03%
Medium	n	132	54	23	110	43	19	22	11	04	---		
	%	63%	26%	11%	64%	25%	11%	59%	30%	11%			
Low	n	142	31	09	136	27	09	06	04	00	---		
	%	78%	07%	05%	79%	16%	5%	60%	40%	00%			

\*= p< 0.05   \*\*= p< 0.01   \*\*\*= p< 0.0001   ns= non-significant

Table AP14.5. Subjective impact on performance dimension (after factor analysis) of the sample : Number of subjects who are satisfied (S), relatively satisfied (RS) and unsatisfied (US) with performance (after factor analysis) for those who do not wear a prosthesis, those who wear a partial prosthesis and those who wear full denture.

All subjects (n=662)			Subjects who do not wear a prosthesis (n=465)			Subjects who wear a partial prosthesis (n=106)			Subjects who wear full denture (n=91)			
	S	RS	US	S	RS	US	S	RS	US	S	RS	US
<b>Gender</b>												
Male	n 298	54	07	218	34	04	43	13	02	37	07	01
	% 83%	15%	02%	85%	13%	02%	74%	22%	03%	82%	16%	02%
Female	n 254	38	11	180	20	09	37	09	02	37	09	00
	% 84%	12%	04%	86%	10%	04%	77%	19%	04%	80%	20%	00%
<b>Social class</b>												
High	n 286	17	01	263	13	01	23	04	00	---		
	% 94%	61%	03%	95%	47%	.4%	85%	15%	00%			
Low	n 266	75	17	135	41	12	57	18	04	74	16	01
	% 74%	21%	05%	72%	22%	06%	72%	23%	05%	81%	18%	01%
<b>DMFT</b>												
High	n 206	39	09	90	25	06	42	14	03	74	16	01
	% 76%	14%	03%	74%	21%	05%	71%	24%	05%	81%	18%	01%
Medium	n 180	22	07	150	15	07	30	07	00	----		
	% 86%	11%	03%	87%	09%	04%	81%	19%	00%			
Low	n 164	15	01	158	14	00	08	01	01	----		
	% 90%	08%	02%	92%	08%	00%	80%	10%	10%			

\*= p< 0.05 \*\*= p< 0.01 \*\*\*= p< 0.0001 ns= non-significant

Table AP14.6. Subjective impact on eating restriction dimension (after factor analysis) of the sample : Number of subjects who are satisfied (S), relatively satisfied (RS) and unsatisfied (US) with eating restriction (afetr factor analysis) for those who do not wear a prosthesis, those who wear a partial prosthesis and those who wear full denture.

All subjects (n=662)			Subjects who do not wear a prosthesis (n=465)			Subjects who wear a partial prosthesis (n=106)			Subjects who wear full denture (n=91)				
	S	RS	US	S	RS	US	S	RS	US	S	RS	US	
<b>Gender</b>													
Male	n	303	48	08	220	30	06	41	14	03	42	03	00
	%	84%	14%	02%	86%	12%	02%	71%	24%	05%	93%	07%	00%
Female	n	243	47	13	175	26	08	27	16	05	42	03	01
	%	80%	16%	04%	84%	12%	04%	56%	33%	11%	91%	07%	02%
<b>Social class</b>													
High	n	271	29	04	253	20	04	18	08	01	---	---	---
	%	89%	10%	01%	91%	07%	01%	66%	30%	04%			
Low	n	275	66	17	142	36	10	50	22	07	84	06	01
	%	77%	18%	05%	76%	19%	05%	63%	28%	09%	92%	07%	01%
<b>DMFT</b>													
High	n	201	57	13	85	29	00	32	22	05	84	06	01
	%	74%	21%	05%	70%	24%	00%	54%	36%	10%	92%	07%	01%
Medium	n	181	22	06	151	16	05	30	06	01	----	----	----
	%	87%	10%	03%	88%	09%	03%	81%	16%	03%			
Low	n	165	14	03	159	11	02	06	03	01	----	----	----
	%	91%	08%	01%	92%	06%	01%	60%	30%	10%			

\*= p< 0.05   \*\*= p< 0.01   \*\*\*= p< 0.0001   ns= non-significant

Table AP14.7. Subjective impact on the total score of the questionnaire for the sample: Number of subjects who are satisfied (S), relatively satisfied (RS) and unsatisfied (US) with the total score of the questionnaire for those who do not wear a prosthesis, those who wear a partial prosthesis and those who wear full denture.

All subjects (n=662)				Subjects who do not wear a prosthesis (n=465)			Subjects who wear a partial prosthesis (n=106)			Subjects who wear full denture (n=91)			
	S	RS	US	S	RS	US	S	RS	US	S	RS	US	
<b>Gender:</b>													
Male	n	200	152	07	146	105	05	29	27	02	25	20	00
	%	56%	42%	02%	57%	41%	02%	50%	47%	03%	56%	44%	00%
Female	n	162	132	09	120	81	08	21	26	01	21	25	00
	%	53%	44%	03%	57%	39%	04%	44%	54%	02%	46%	54%	00%
<b>Social class:</b>													
High	n	196	105	03	183	91	03	13	14	00	---	---	---
	%	64%	35%	01%	66%	33%	01%	48%	52%	00%			
Low	n	166	179	13	83	95	10	37	39	03	46	45	00
	%	46%	50%	04%	44%	50%	05%	47%	49%	04%	51%	49%	00%
<b>DMFT</b>													
High	n	110	150	11	43	70	08	21	35	03	46	45	00
	%	41%	55%	04%	35%	58%	07%	36%	59%	05%	51%	49%	00%
Medium	n	116	89	04	92	76	04	24	13	00	----	----	----
	%	55%	43%	02%	54%	44%	02%	65%	35%	00%			
Low	n	136	05	01	131	40	01	05	05	00	----	----	----
	%	75%	25%	.5%	76%	23%	01%	50%	50%	00%			

\*= p< 0.05 \*\*= p< 0.01 \*\*\*= p< 0.0001 ns= non-significant

## APPENDIX 15

### CLINICAL STATUS OF SATISFACTION CATEGORIES

Items of the questionnaire were added up to give total scores for each dimension and these scores were divided into three groups: satisfied (scores above 0.69), relatively satisfied (scores from 0.69 to 0, including 0) and unsatisfied (scores below 0). Mean scores of clinical status of each of these three groups were calculated and compared. Kruskall-Wallis one-way anova test was done to test for significant different distributions of oral status between these three groups. This was calculated for each dimension and the total score of the questionnaire for those who do not wear a prosthesis (from table AP15.1 to table AP15.7), for those who wear a partial prosthesis (from tables AP15.8 to table AP15.14) and for those who wear a full upper denture (from table AP15.15 to table AP15.21).

Table AP15.1. Mean scores of clinical status of those who do not wear a prosthesis in each group of satisfaction for performance dimension (n=465).

	UNSATISFIED (n= 11)		RELATIVELY SATISFIED (n=62)		SATISFIED (n=392)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	6.64	4.98	3.08	3.85	.80	1.58
ANT. DECAYED T.	2.45	2.02	1.31	1.65	.26	.78
POST. DECAYED T.	4.19	2.96	1.77	2.19	.54	.80
MISSING TEETH	9.82	6.46	7.08	4.55	2.90	3.12
ANT. MISSING	3.36	3.29	.85	1.53	.15	.61
POST. MISSING	6.45	4.18	6.23	3.75	2.75	2.88
MOLAR PAIRS	1.36	1.36	1.16	1.28	2.50	1.44
MOLAR TEETH	4.18	2.56	4.23	2.05	6.19	1.97
PREMOLAR PAIRS	2.00	1.18	2.16	1.45	3.29	1.10
PREMOLAR TEETH	5.55	2.11	5.76	2.00	7.23	1.25
FILLED TEETH	1.73	4.34	5.79	6.07	9.48	5.89
ANT. FILLED T.	.55	1.51	1.69	2.44	1.88	2.16
POST. FILLED T.	1.18	3.23	4.10	3.98	7.60	3.90
DMFT	18.27	5.44	15.97	6.05	13.22	6.06
BLEEDING	5.00	6.53	5.27	4.94	2.86	4.39
CALCULUS	6.20	4.84	6.40	4.30	3.27	5.27
POCKET	1.18	2.56	1.31	3.07	.28	1.18
GING. RECESSION (2mm)	.82	.98	.92	1.62	1.46	2.73
GING. RECESSION (+ 2mm)	2.45	3.21	2.66	3.83	2.33	3.24
MOBILITY	.08	.20	.04	.09	.00	.02
BUCCAL ATTRITION	.00	.00	.01	.02	.01	.05
OCCLUSAL ATTRITION	.07	.12	.07	.17	.05	.15
BUCCAL STAIN	.09	.30	.74	1.89	.28	1.05
ENAMEL DEFECTS	.01	.03	.02	.13	.01	.05

Table AP15.2. Mean scores of clinical status of those who do not wear a prosthesis in each group of satisfaction for appearance dimension (n=465).

	UNSATISFIED (n= 108)		RELATIVELY SATISFIED (n= 108)		SATISFIED (n=249)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	2.82	3.83	1.41	2.13	.49	1.03
ANT. DECAYED T.	1.26	1.73	.44	.87	.10	.42
POST. DECAYED T.	1.56	2.86	.97	1.70	.39	.80
MISSING TEETH	6.22	4.58	4.21	3.63	2.24	2.80
ANT. MISSING	.82	1.81	.36	.95	.08	.39
POST. MISSING	5.40	3.56	3.85	3.18	2.15	2.67
MOLAR PAIRS	1.45	1.31	1.94	1.48	2.82	1.36
MOLAR TEETH	4.69	2.10	5.49	2.11	6.56	1.84
PREMOLAR PAIRS	2.46	1.36	2.95	1.26	3.46	1.01
PREMOLAR TEETH	6.17	1.87	6.89	1.40	7.41	1.18
FILLED TEETH	7.94	6.57	8.88	6.18	9.14	5.84
ANT. FILLED T.	2.25	2.41	1.94	2.26	1.59	2.03
POST. FILLED T.	5.69	3.63	6.94	4.48	7.55	3.70
DMFT	17.05	5.43	14.56	5.20	11.89	6.14
BLEEDING	4.67	5.12	4.23	5.27	2.18	3.71
CALCULUS	4.15	5.31	4.13	4.19	4.27	4.47
POCKET	1.07	2.61	.35	1.24	.20	1.10
GING. RECEDITION (2mm)	1.18	2.22	1.20	1.39	1.53	2.81
GING. RECEDITION (+ 2mm)	2.19	2.85	3.29	4.07	2.06	3.07
MOBILITY	.03	.09	.01	.05	.00	.00
BUCCAL ATTRITION	.01	.03	.01	.03	.01	.06
OCCLUSAL ATTRITION	.04	.13	.05	.13	.05	.16
BUCCAL STAIN	.47	1.44	.56	1.65	.18	.75
ENAMEL DEFECTS	.02	.12	.01	.02	.01	.04

Table AP15.3. Mean scores of clinical status of those who do not wear a prosthesis in each group of satisfaction in the comfort dimension (n=465).

	UNSATISFIED (n= 34)		RELATIVELY SATISFIED (n= 201)		SATISFIED (n=230)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	2.29	3.46	1.19	2.03	1.13	2.54
ANT. DECAYED T.	.88	1.53	.45	.98	.39	1.08
POST. DECAYED T.	1.41	2.96	.74	2.00	.74	1.70
MISSING TEETH	5.62	4.40	3.55	3.90	3.39	3.63
ANT. MISSING	.82	2.14	.36	1.08	.21	.76
POST. MISSING	4.79	3.31	3.19	3.21	3.17	3.32
MOLAR PAIRS	1.68	1.36	2.27	1.46	2.41	1.53
MOLAR TEETH	5.06	2.01	5.86	2.04	6.01	2.17
PREMOLAR PAIRS	2.62	1.33	3.21	1.16	3.10	1.25
PREMOLAR TEETH	6.44	1.69	7.10	1.46	6.99	1.49
FILLED TEETH	9.06	5.77	10.09	6.14	7.64	5.90
ANT. FILLED T.	2.12	2.20	2.22	2.38	1.43	1.95
POST. FILLED T.	6.94	2.63	7.87	4.49	6.21	3.76
DMFT	16.97	4.71	14.91	5.83	12.18	6.19
BLEEDING	5.94	6.17	3.86	4.87	2.29	3.77
CALCULUS	6.38	5.01	4.13	4.67	2.97	4.50
POCKET	2.14	3.64	.54	1.78	.09	.50
GING. RECEDITION (2mm)	1.32	2.06	1.38	2.53	1.37	2.71
GING. RECEDITION (+ 2mm)	2.79	3.42	2.27	3.06	2.40	3.51
MOBILITY	.06	.14	.01	.04	.00	.02
BUCCAL ATTRITION	.01	.03	.01	.05	.01	.05
OCCLUSAL ATTRITION	.05	.12	.04	.13	.06	.17
BUCCAL STAIN	.26	1.08	.24	.92	.43	1.41
ENAMEL DEFECTS	.01	.02	.01	.07	.01	.07

Table AP15.4. Mean scores of clinical status of those who do not wear a prosthesis in each group of satisfaction in the pain dimension (n=465).

	UNSATISFIED (n= 45)		RELATIVELY SATISFIED (n= 103)		SATISFIED (n= 317)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	2.24	3.23	1.77	2.87	.93	2.05
ANT. DECAYED T.	.91	1.44	.60	1.30	.34	.92
POST. DECAYED T.	1.33	2.93	1.17	1.80	.59	1.70
MISSING TEETH	5.29	4.80	4.17	4.00	3.21	3.55
ANT. MISSING	.64	1.76	.47	1.24	.23	.85
POST. MISSING	4.64	3.96	3.71	3.22	2.98	3.16
MOLAR PAIRS	2.02	1.56	1.99	1.40	2.44	1.50
MOLAR TEETH	5.36	2.32	5.56	1.96	6.05	2.11
PREMOLAR PAIRS	2.62	1.39	3.04	1.19	3.20	1.20
PREMOLAR TEETH	6.29	1.96	6.92	1.50	7.12	1.40
FILLED TEETH	8.11	6.26	9.28	6.46	8.75	5.97
ANT. FILLED T.	1.93	2.49	2.06	2.20	1.74	2.14
POST. FILLED T.	6.18	4.63	7.22	4.39	7.01	3.36
DMFT	15.71	5.87	15.27	5.50	12.92	6.23
BLEEDING	4.27	5.17	3.56	4.74	2.98	4.45
CALCULUS	5.38	5.00	4.03	4.00	2.97	3.50
POCKET	.51	1.56	.59	1.93	.38	1.55
GING. RECESSION (2mm)	1.20	2.74	1.40	2.28	1.39	2.66
GING. RECESSION (+ 2mm)	2.00	2.65	3.00	3.53	2.22	3.31
MOBILITY	.03	.11	.01	.05	.01	.04
BUCCAL ATTRITION	.01	.03	.02	.05	.01	.05
OCCLUSAL ATTRIT.	.07	.16	.04	.14	.05	.15
BUCCAL STAIN	.67	1.64	.23	.84	.32	1.22
ENAMEL DEFECTS	.00	.02	.02	.10	.01	.06

Table AP15.5. Mean scores of clinical status of those who do not wear a prosthesis in each group of satisfaction in the total score of the questionnaire (n=465).

	UNSATISFIED (n= 13)		RELATIVELY SATISFIED (n= 186)		SATISFIED (n=266)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	4.77	4.51	2.05	3.11	.50	1.01
ANT. DECAYED T.	2.23	1.92	.78	1.39	.14	.46
POST. DECAYED T.	2.54	2.86	1.27	2.70	.36	.80
MISSING TEETH	8.54	4.68	4.81	4.21	2.55	3.03
ANT. MISSING	1.69	2.95	.52	1.30	.12	.51
POST. MISSING	6.85	3.44	4.29	3.43	2.44	2.87
MOLAR PAIRS	1.23	1.30	1.87	1.43	2.65	1.45
MOLAR TEETH	4.23	1.92	5.28	2.16	6.37	1.94
PREMOLAR PAIRS	1.77	1.17	2.82	1.30	3.38	1.08
PREMOLAR TEETH	5.08	2.06	6.67	1.61	7.32	1.25
FILLED TEETH	4.69	4.44	9.12	6.59	8.79	5.75
ANT. FILLED T.	1.62	2.14	2.22	2.46	1.56	1.95
POST. FILLED T.	3.07	2.63	6.90	4.48	7.23	3.78
DMFT	18.00	5.82	16.04	5.39	11.87	6.02
BLEEDING	4.77	3.94	4.22	5.14	2.47	4.05
CALCULUS	4.95	5.91	3.13	4.67	2.17	4.00
POCKET	1.85	2.51	.68	2.07	.20	1.12
GING. RECESSION (2mm)	1.23	2.05	1.39	2.49	1.37	2.68
GING. RECESSION (+ 2mm)	2.38	3.23	2.70	4.50	2.15	3.18
MOBILITY	.01	.19	.01	.05	.00	.02
BUCCAL ATTRITION	.01	.02	.01	.05	.01	.05
OCCLUSAL ATTRITION	.06	.11	.05	.15	.05	.15
BUCCAL STAIN	1.00	1.91	.35	1.26	.29	1.11
ENAMEL DEFECTS	.01	.02	.01	.09	.01	.04

Table AP15.6. Mean scores of clinical status of those who do not wear a prosthesis in each group of satisfaction in the performance dimension after factor analysis (n=465).

	UNSATISFIED (n= 13)		RELATIVELY SATISFIED (n=54)		SATISFIED (n=398)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	6.15	4.74	3.31	4.13	.80	1.53
ANT. DECAYED T.	2.46	1.85	1.43	1.83	.25	.72
POST. DECAYED T.	3.69	2.91	1.88	2.39	.55	.90
MISSING TEETH	10.31	6.07	7.09	4.44	2.93	3.15
ANT. MISSING	3.15	3.08	.89	1.60	.15	.60
POST. MISSING	7.15	4.20	6.20	3.63	2.78	2.92
MOLAR PAIRS	1.15	1.34	1.17	1.24	2.49	1.45
MOLAR TEETH	3.92	2.43	4.22	2.04	6.17	1.98
PREMOLAR PAIRS	1.77	1.24	2.24	1.39	3.27	1.13
PREMOLAR TEETH	5.15	2.19	5.85	1.94	7.21	1.28
FILLED TEETH	1.77	4.04	5.76	5.77	9.45	5.94
ANT. FILLED T.	.54	1.39	1.76	2.50	1.88	2.16
POST. FILLED T.	1.23	2.95	4.00	3.27	7.57	3.80
DMFT	18.31	5.07	16.19	6.03	13.22	6.06
BLEEDING	5.00	5.96	5.03	4.74	2.91	4.46
CALCULUS	8.31	4.52	7.67	5.19	5.01	5.29
POCKET	1.08	2.36	1.24	2.85	.31	1.34
GING. RECESSION (2mm)	.69	.95	1.24	2.36	1.41	2.65
GING. RECESSION (+2mm)	2.62	3.12	2.78	4.01	2.31	3.22
MOBILITY	.08	.18	.03	.08	.00	.03
BUCCAL ATTRITION	.00	.00	.01	.02	.01	.05
OCCLUSAL ATTRITION	.10	.17	.07	.18	.05	.14
BUCCAL STAIN	.15	.38	.72	1.88	.29	1.09
ENAMEL DEFECTS	.08	.13	.06	.18	.08	.05

Table AP15.7. Mean scores of clinical status of those who do not wear a prosthesis in each group of satisfaction in the eating restriction dimension after factor analysis (n=465).

	UNSATISFIED (n= 14)		RELATIVELY SATISFIED (n= 56)		SATISFIED (n=395)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	2.57	2.44	2.75	4.45	.98	1.88
ANT. DECAYED T.	1.57	1.65	1.02	1.74	.33	.87
POST. DECAYED T.	1.00	2.16	1.73	2.80	.65	1.00
MISSING TEETH	10.21	7.06	6.50	4.03	2.98	3.22
ANT. MISSING	3.43	3.25	.64	1.23	.16	.63
POST. MISSING	6.79	4.59	5.86	3.57	2.82	2.95
MOLAR PAIRS	1.43	1.55	1.25	1.32	2.48	1.44
MOLAR TEETH	4.21	2.81	4.39	2.02	6.15	1.99
PREMOLAR PAIRS	2.00	1.30	2.14	1.49	3.29	1.09
PREMOLAR TEETH	5.29	2.33	5.89	1.88	7.21	1.29
FILLED TEETH	5.07	6.16	7.32	6.53	9.15	5.98
ANT. FILLED T.	1.29	1.90	2.13	2.57	1.80	2.14
POST. FILLED T.	3.78	4.83	5.19	3.49	7.35	4.00
DMFT	17.86	6.98	16.59	5.53	13.15	6.04
BLEEDING	4.79	4.71	4.59	5.27	2.99	4.46
CALCULUS	4.15	2.31	4.63	4.09	3.27	4.47
POCKET	2.21	3.58	1.07	2.74	.29	1.23
GING. RECESSION (2mm)	.71	.91	1.14	2.01	1.43	2.69
GING. RECESSION (+2mm)	4.00	5.80	2.20	2.98	2.34	3.24
MOBILITY	.14	.20	.02	.07	.00	.02
BUCCAL ATTRITION	.02	.03	.02	.10	.01	.03
OCCLUSAL ATTRITION	.06	.15	.06	.15	.05	.15
BUCCAL STAIN	.43	1.16	.63	1.71	.29	1.11
ENAMEL DEFECTS	.88	.18	.09	.21	.15	.14

Table AP15.8. Mean scores of clinical status of those who wear a partial prosthesis and do not wear upper denture in each group of satisfaction in the performance dimension (n=106).

	UNSATISFIED (n= 3)		RELATIVELY SATISFIED (n= 30)		SATISFIED (n= 73)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	4.33	3.06	2.00	1.76	1.37	1.85
ANT. DECAYED T.	2.00	2.65	1.03	1.27	.55	.94
POST. DECAYED T.	2.33	1.53	.97	.59	.82	1.09
MISSING TEETH	13.33	4.62	12.30	4.84	9.93	4.71
ANT. MISSING	5.00	3.61	3.43	2.21	2.47	2.12
POST. MISSING	8.33	5.13	8.87	3.54	7.47	3.58
MOLAR PAIRS	.00	.00	.57	1.07	.89	1.19
MOLAR TEETH	2.67	1.53	2.83	2.09	3.44	2.27
PREMOLAR PAIRS	2.00	2.00	1.10	1.24	1.67	1.37
PREMOLAR TEETH	5.00	3.60	4.40	1.99	5.16	1.95
FILLED TEETH	1.33	1.53	5.63	4.82	6.37	4.51
ANT. FILLED T.	.00	.00	1.23	1.50	1.47	1.54
POST. FILLED T.	1.33	1.53	4.40	2.76	4.90	3.00
DMFT	19.00	6.08	19.93	3.74	17.79	4.31
BLEEDING	4.67	2.31	3.00	3.70	3.10	4.22
CALCULUS	3.00	2.00	5.00	4.90	5.60	3.90
POCKET	2.00	1.73	.70	1.66	.30	.84
GING. RECESSION (2mm)	1.33	.58	1.57	1.72	1.10	2.34
GING. RECESSION (+2mm)	1.33	2.31	2.20	3.34	2.29	3.22
MOBILITY	.03	.05	.03	.09	.01	.02
BUCCAL ATTRITION	.00	.00	.03	.07	.02	.06
OCCLUSAL ATTRITION	.06	.10	.05	.15	.05	.14
BUCCAL STAIN	.00	.00	.03	.18	.04	.35
ENAMEL DEFECTS	.00	.00	.00	.02	.01	.05

Table AP15.9. Mean scores of clinical status of those who wear a partial prosthesis and do not wear upper denture in each group of satisfaction in the appearance dimension (n=106).

	UNSATISFIED (n= 26)		RELATIVELY SATISFIED (n= 37)		SATISFIED (n= 43)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	1.85	1.64	1.68	2.03	1.47	2.00
ANT. DECAYED T.	.77	1.07	.84	1.30	.60	1.03
POST. DECAYED T.	1.08	1.49	.84	1.59	.87	1.00
MISSING TEETH	10.88	4.87	11.92	5.02	9.53	4.49
ANT. MISSING	3.19	2.25	3.30	2.25	2.16	2.10
POST. MISSING	7.69	3.96	8.62	3.59	7.37	3.43
MOLAR PAIRS	.96	1.31	.57	1.07	.84	1.11
MOLAR TEETH	3.42	2.45	2.97	2.11	3.37	2.15
PREMOLAR PAIRS	1.62	1.50	1.27	1.33	1.67	1.32
PREMOLAR TEETH	5.00	2.23	4.49	2.08	5.30	1.79
FILLED TEETH	6.69	5.23	5.16	4.06	6.35	4.63
ANT. FILLED T.	1.54	1.73	1.00	1.20	1.56	1.61
POST. FILLED T.	5.15	3.83	4.16	2.86	4.79	3.48
DMFT	19.42	4.41	18.92	4.45	17.42	3.89
BLEEDING	2.85	3.65	2.65	4.36	3.67	3.94
CALCULUS	3.22	4.05	3.00	1.90	3.00	3.00
POCKET	.35	.80	.46	1.49	.53	1.12
GING. RECESSION (2mm)	1.65	2.88	1.34	1.95	1.00	2.51
GING. RECESSION (+2mm)	2.54	3.88	2.08	3.17	2.19	2.84
MOBILITY	.00	.00	.02	.07	.01	.05
BUCCAL ATTRITION	.03	.08	.02	.08	.01	.04
OCCLUSAL ATTRITION	.07	.18	.04	.13	.05	.12
BUCCAL STAIN	.00	.00	.03	.16	.07	.46
ENAMEL DEFECTS	.01	.02	.01	.02	.01	.07

Table AP15.10. Mean scores of clinical status of those who wear a partial prosthesis and do not wear upper denture in each group of satisfaction in the comfort dimension (n=106).

	UNSATISFIED (n= 9)		RELATIVELY SATISFIED (n= 42)		SATISFIED (n= 55)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	2.22	1.92	1.60	1.71	1.56	2.08
ANT. DECAYED T.	1.11	1.62	.74	1.15	.65	1.04
POST. DECAYED T.	1.11	1.03	.86	.59	.91	1.00
MISSING TEETH	12.56	4.77	10.55	4.03	10.51	5.41
ANT. MISSING	3.11	2.26	2.74	1.99	2.82	2.44
POST. MISSING	9.44	3.91	7.81	3.13	7.69	3.93
MOLAR PAIRS	.78	1.39	.74	.99	.80	1.24
MOLAR TEETH	2.55	2.51	3.38	1.99	3.25	2.33
PREMOLAR PAIRS	1.22	1.39	1.33	1.14	1.71	1.51
PREMOLAR TEETH	4.11	2.26	4.95	1.62	5.07	2.24
FILLED TEETH	6.56	5.31	6.48	4.44	5.58	4.65
ANT. FILLED T.	1.56	1.51	1.45	1.62	1.25	1.46
POST. FILLED T.	5.00	3.63	5.03	3.29	4.33	3.29
DMFT	21.33	1.50	18.71	4.07	17.74	4.54
BLEEDING	4.00	4.03	2.71	3.72	3.27	4.27
CALCULUS	4.22	3.05	3.09	3.00	3.07	3.59
POCKET	1.56	2.65	.24	.66	.45	1.07
GING. RECEDITION (2mm)	.44	1.01	1.55	3.13	1.07	1.89
GING. RECEDITION (+2mm)	1.44	1.74	2.50	3.54	2.16	3.15
MOBILITY	.05	.12	.00	.02	.01	.04
BUCCAL ATTRITION	.03	.07	.02	.05	.02	.07
OCCLUSAL ATTRITION	.07	.17	.07	.16	.03	.11
BUCCAL STAIN	.00	.00	.02	.15	.05	.40
ENAMEL DEFECTS	.00	.00	.01	.03	.01	.06

Table AP15.11. Mean scores of clinical status of those who wear a partial prosthesis and do not wear upper denture in each group of satisfaction in the pain dimension (n=106).

	UNSATISFIED (n= 10)		RELATIVELY SATISFIED (n= 36)		SATISFIED (n= 60)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	2.70	1.89	1.75	1.86	1.38	1.92
ANT. DECAYED T.	1.10	1.29	.89	1.33	.57	.96
POST. DECAYED T.	1.60	1.03	.86	1.07	.81	1.00
MISSING TEETH	12.00	4.29	11.19	4.71	10.18	5.00
ANT. MISSING	2.90	2.08	2.86	2.39	2.77	2.20
POST. MISSING	9.10	2.56	8.33	3.53	7.42	3.80
MOLAR PAIRS	.40	.70	.64	1.05	.92	1.25
MOLAR TEETH	2.30	1.49	3.03	2.24	3.53	2.25
PREMOLAR PAIRS	1.30	1.34	1.22	1.10	1.73	1.49
PREMOLAR TEETH	4.60	1.96	4.69	1.74	5.15	2.18
FILLED TEETH	4.80	3.71	5.58	4.71	6.48	4.67
ANT. FILLED T.	1.40	1.71	1.31	1.62	1.38	1.45
POST. FILLED T.	3.48	2.63	4.27	3.09	5.10	3.06
DMFT	19.50	3.72	18.56	4.38	18.18	4.32
BLEEDING	3.02	4.02	3.19	3.59	3.05	4.31
CALCULUS	4.08	3.08	3.03	3.80	3.57	3.59
POCKET	.40	.84	.75	1.61	.30	.89
GING. RECEDITION (2mm)	1.40	2.37	1.56	3.26	.97	1.78
GING. RECEDITION (+2mm)	2.60	2.37	1.97	3.26	2.33	3.32
MOBILITY	.00	.00	.03	.08	.00	.02
BUCCAL ATTRITION	.02	.03	.02	.06	.02	.07
OCCLUSAL ATTRITION	.09	.18	.04	.11	.05	.14
BUCCAL STAIN	.00	.00	.03	.17	.05	.39
ENAMEL DEFECTS	.01	.03	.00	.02	.01	.06

Table AP15.12. Mean scores of clinical status of those who wear a partial prosthesis and do not wear upper denture in each group of satisfaction in the total score of the questionnaire (n=106).

	UNSATISFIED (n= 3)		RELATIVELY SATISFIED (n= 53)		SATISFIED (n= 50)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	4.00	2.65	1.75	1.74	1.36	1.99
ANT. DECAYED T.	2.67	2.08	.77	1.15	.56	.95
POST. DECAYED T.	1.33	.93	.98	.98	.80	1.09
MISSING TEETH	16.33	3.51	11.47	4.56	9.54	4.87
ANT. MISSING	4.00	2.00	3.15	2.33	2.3	2.09
POST. MISSING	12.33	2.89	8.32	3.42	7.16	3.67
MOLAR PAIRS	.33	.58	.66	1.09	.92	1.23
MOLAR TEETH	1.67	2.08	3.04	2.14	3.56	2.25
PREMOLAR PAIRS	.33	.58	1.30	1.31	1.82	1.40
PREMOLAR TEETH	2.00	1.00	4.75	1.93	5.32	2.00
FILLED TEETH	2.33	4.04	5.94	4.70	6.32	4.51
ANT. FILLED T.	.33	.58	1.38	1.62	1.40	1.44
POST. FILLED T.	2.00	3.62	4.56	2.89	4.92	2.99
DMFT	22.67	.58	19.21	4.15	17.36	4.22
BLEEDING	3.33	4.16	2.53	3.41	3.72	4.56
CALCULUS	4.67	4.05	3.00	2.90	3.01	3.29
POCKET	1.00	1.73	.47	1.34	.42	.99
GING. RECESSION (2mm)	1.00	1.73	1.34	2.91	1.08	1.85
GING. RECESSION (+2mm)	1.33	2.31	2.43	3.67	2.08	2.72
MOBILITY	.03	.05	.02	.07	.01	.02
BUCCAL ATTRITION	.02	.03	.03	.07	.02	.06
OCCLUSAL ATTRITION	.06	.10	.06	.16	.04	.11
BUCCAL STAIN	.00	.00	.02	.14	.06	.42
ENAMEL DEFECTS	.00	.00	.00	.02	.01	.06

Table AP15.13. Mean scores of clinical status of those who wear a partial prosthesis and do not wear upper denture in each group of satisfaction in the performance dimension after factor analysis (n=106).

	UNSATISFIED (n= 4)		RELATIVELY SATISFIED (n= 22)		SATISFIED (n= 80)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	4.00	2.58	2.14	1.86	1.38	1.82
ANT. DECAYED T.	2.00	2.16	1.05	1.40	.58	.94
POST. DECAYED T.	2.00	1.03	1.09	.77	.80	1.08
MISSING TEETH	15.00	5.03	11.82	4.11	10.18	4.91
ANT. MISSING	5.25	2.99	3.18	1.82	2.59	2.24
POST. MISSING	9.75	5.06	8.64	3.16	7.59	3.67
MOLAR PAIRS	.00	.00	.59	1.09	.86	1.18
MOLAR TEETH	2.00	1.83	2.82	2.08	3.43	2.24
PREMOLAR PAIRS	1.50	1.91	1.23	1.27	1.60	1.37
PREMOLAR TEETH	4.25	3.30	4.68	1.78	5.05	2.02
FILLED TEETH	1.00	1.41	5.32	4.28	6.46	4.64
ANT. FILLED T.	.00	.00	1.14	1.42	1.49	1.55
POST. FILLED T.	1.00	1.41	4.18	2.76	4.97	3.01
DMFT	20.00	5.35	19.27	4.11	18.13	4.27
BLEEDING	5.50	2.52	2.55	3.86	3.15	4.11
CALCULUS	6.00	2.20	4.20	4.00	3.60	3.50
POCKET	1.50	1.73	.41	.91	.43	1.22
GING. RECEDITION (2mm)	.25	.50	1.50	2.32	1.18	2.50
GING. RECEDITION (+2mm)	1.00	2.00	2.36	3.77	2.26	3.11
MOBILITY	.02	.04	.00	.02	.01	.06
BUCCAL ATTRITION	.00	.00	.03	.07	.02	.06
OCCLUSAL ATTRITION	.04	.08	.06	.17	.05	.13
BUCCAL STAIN	.00	.00	.05	.21	.04	.34
ENAMEL DEFECTS	.00	.00	.00	.05	.01	.03

Table AP15.14. Mean scores of clinical status of those who wear a partial prosthesis and do not wear upper denture in each group of satisfaction in the eating restriction dimension after factor analysis (n=106).

	UNSATISFIED (n= 6)		RELATIVELY SATISFIED (n= 33)		SATISFIED (n= 67)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	2.00	1.79	2.09	2.23	1.37	1.74
ANT. DECAYED T.	.50	.55	1.06	1.43	.58	.97
POST. DECAYED T.	1.50	1.14	1.03	.49	.79	1.00
MISSING TEETH	13.33	3.56	12.64	4.79	9.51	4.61
ANT. MISSING	5.33	1.97	3.39	2.28	2.30	2.03
POST. MISSING	8.00	2.68	9.24	3.55	7.21	3.59
MOLAR PAIRS	.33	.52	.45	.90	.97	1.25
MOLAR TEETH	3.33	1.75	2.48	1.94	3.61	2.29
PREMOLAR PAIRS	1.33	1.51	1.21	1.36	1.69	1.35
PREMOLAR TEETH	4.67	1.97	4.36	2.26	5.25	1.85
FILLED TEETH	5.00	4.52	4.76	4.51	6.73	4.56
ANT. FILLED T.	.83	1.60	1.09	1.59	1.54	1.47
POST. FILLED T.	4.17	3.33	3.67	2.82	5.19	3.21
DMFT	20.33	4.23	19.55	4.15	17.72	4.22
BLEEDING	2.00	3.10	3.15	3.56	3.19	4.32
CALCULUS	3.80	2.00	3.20	3.70	3.40	3.30
POCKET	.50	1.22	.64	1.60	.37	.93
GING. RECESSION (2mm)	.67	1.21	1.45	2.69	1.13	2.37
GING. RECESSION (+2mm)	1.67	2.00	1.88	2.37	2.46	3.64
MOBILITY	.02	.04	.00	.08	.01	.02
BUCCAL ATTRITION	.00	.00	.03	.07	.02	.06
OCCLUSAL ATTRITION	.00	.00	.07	.17	.05	.13
BUCCAL STAIN	.00	.00	.12	.55	.00	.00
ENAMEL DEFECTS	.00	.01	.00	.04	.01	.09

Table AP15.15. Mean scores of clinical status of those who wear a full upper denture in each group of satisfaction in the performance dimension (n=91).

	UNSATISFIED (n= 1)		RELATIVELY SATISFIED (n= 19)		SATISFIED (n= 71)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	8.00	.00	1.32	1.16	1.01	1.29
MISSING TEETH	19.00	.00	21.42	2.52	20.30	2.56
ANT. MISSING	8.00	.00	7.32	1.67	6.61	1.31
POST. MISSING	11.00	.00	14.11	1.66	13.69	1.80
FILLED TEETH	1.00	.00	1.42	1.47	1.07	1.63
DMFT	28.00	.00	24.16	2.41	22.38	2.84
BLEEDING	4.00	.00	2.58	2.71	2.31	3.14
CALCULUS	5.60	.00	4.00	4.90	3.60	3.90
POCKET	.00	.00	.95	1.58	.32	.91
GING. RECEDITION (2mm)	.00	.00	.32	.58	.37	.99
GING. RECEDITION (+2mm)	.00	.00	1.84	1.86	1.87	2.58
MOBILITY	.00	.00	.16	.31	.06	.18
BUCCAL ATTRITION	.00	.00	.00	.00	.00	.02
OCCLUSAL ATTRITION	.00	.00	.05	.23	.03	.14
BUCCAL STAIN	.00	.00	.00	.00	.20	.79
ENAMEL DEFECTS	.00	.00	.00	.00	.00	.04

Table AP15.16. Mean scores of clinical status of those who wear a full upper denture in each group of satisfaction in the appearance dimension (n=91).

	UNSATISFIED (n= 17)		RELATIVELY SATISFIED (n= 28)		SATISFIED (n= 46)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	1.41	.94	1.46	1.87	.87	1.28
MISSING TEETH	22.00	1.90	20.00	2.07	20.28	2.88
ANT. MISSING	7.24	1.60	6.57	1.10	6.72	1.50
POST. MISSING	14.76	1.09	13.43	1.69	13.57	1.94
FILLED TEETH	1.41	1.73	1.04	1.43	1.11	1.65
DMFT	24.82	2.19	22.50	2.73	22.26	2.90
BLEEDING	2.35	2.67	3.75	3.33	2.35	2.88
CALCULUS	3.94	2.74	4.00	4.20	3.60	3.00
POCKET	.65	1.22	.43	1.23	.39	.97
GING. RECEDITION (2mm)	.41	1.00	.50	1.26	.24	.57
GING. RECEDITION (+2mm)	2.65	2.52	1.64	2.54	1.67	3.32
MOBILITY	.11	.22	.08	.24	.07	.20
BUCCAL ATTRITION	.00	.00	.00	.02	.00	.02
OCCLUSAL ATTRITION	.06	.24	.01	.03	.04	.17
BUCCAL STAIN	.12	.49	.25	.93	.11	.60
ENAMEL DEFECTS	.02	.09	.10	.18	.00	.03

Table AP15.17. Mean scores of clinical status of those who wear a full upper denture in each group of satisfaction in the comfort dimension (n=91).

	UNSATISFIED (n= 2)		RELATIVELY SATISFIED (n= 40)		SATISFIED (n= 49)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	2.50	3.54	1.05	1.11	1.18	1.62
MISSING TEETH	19.00	.00	20.50	2.53	20.59	2.66
ANT. MISSING	6.00	.00	6.80	1.36	6.78	1.49
POST. MISSING	13.00	.00	13.70	1.81	13.82	1.81
FILLED TEETH	2.50	.71	1.58	1.69	.73	1.41
DMFT	24.00	2.83	23.13	2.95	22.51	2.83
BLEEDING	6.50	3.54	3.13	2.99	2.35	2.96
CALCULUS	7.06	.70	4.50	3.01	3.89	3.14
POCKET	1.50	2.12	.73	1.45	.18	.53
GING. RECEDITION (2mm)	2.67	.09	1.36	2.34	1.35	1.67
GING. RECEDITION (+2mm)	5.50	2.12	1.48	2.29	2.00	2.46
MOBILITY	.50	.12	.10	.24	.07	.19
BUCCAL ATTRITION	.00	.00	.00	.02	.00	.01
OCCLUSAL ATTRITION	.00	.00	.00	.00	.07	.21
BUCCAL STAIN	.00	.00	.05	.32	.24	.90
ENAMEL DEFECTS	.00	.08	.20	.08	.00	.03

Table AP15.18. Mean scores of clinical status of those who wear a full upper denture in each group of satisfaction in the pain dimension (n=91).

	UNSATISFIED (n= 3)		RELATIVELY SATISFIED (n= 36)		SATISFIED (n= 52)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	1.00	1.00	1.42	1.75	.98	1.23
MISSING TEETH	23.00	1.73	20.06	2.20	20.69	2.77
ANT. MISSING	7.00	1.73	6.64	1.15	6.85	1.58
POST. MISSING	16.00	.00	13.42	1.70	13.85	1.81
FILLED TEETH	.33	.58	1.61	1.78	.87	1.41
DMFT	24.33	2.52	23.08	2.93	22.54	2.85
BLEEDING	2.67	2.52	2.78	3.12	2.79	3.04
CALCULUS	3.00	3.00	4.80	3.40	3.60	3.18
POCKET	.33	.58	.44	1.13	.46	1.11
GING. RECESSION (2mm)	.00	.00	.33	.79	.38	1.01
GING. RECESSION (+2mm)	1.00	1.73	1.33	2.26	2.25	2.54
MOBILITY	.11	.19	.05	.18	.11	.23
BUCCAL ATTRITION	.00	.00	.00	.01	.00	.02
OCCLUSAL ATTRITION	.00	.00	.06	.22	.02	.10
BUCCAL STAIN	.00	.00	.06	.33	.23	.88
ENAMEL DEFECTS	.00	.00	.10	.06	.00	.09

Table AP15.19. Mean scores of clinical status of those who wear a full upper denture in each group of satisfaction in the total score of the questionnaire (n=91).

	RELATIVELY SATISFIED (n= 45)		SATISFIED (n= 46)	
	MEAN	SD	MEAN	SD
DECAYED TEETH	1.40	1.57	.91	1.30
MISSING TEETH	20.60	2.34	20.43	2.72
ANT. MISSING	6.82	1.32	6.72	1.52
POST. MISSING	13.78	1.82	13.72	1.77
FILLED TEETH	1.49	1.66	.80	1.45
DMFT	23.49	2.74	22.15	2.87
BLEEDING	3.16	3.13	2.41	2.91
CALCULUS	3.90	2.30	3.02	2.90
POCKET	.56	1.23	.35	.95
GING. RECEDITION (2mm)	.49	1.18	.22	.51
GING. RECEDITION (+2mm)	1.84	2.49	1.85	2.40
MOBILITY	.08	.21	.09	.22
BUCCAL ATTRITION	.00	.01	.00	.02
OCCLUSAL ATTRITION	.03	.15	.04	.17
BUCCAL STAIN	.04	.30	.26	.93
ENAMEL DEFECTS	.02	.08	.00	.02

Table AP15.20. Mean scores of clinical status of those who wear a full upper denture in each group of satisfaction in the performance dimension after factor analysis (n=91).

	UNSATISFIED (n= 1)		RELATIVELY SATISFIED (n= 16)		SATISFIED (n= 74)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	8.00	.00	1.50	1.15	.99	1.28
MISSING TEETH	19.00	.00	21.56	2.42	20.31	2.57
ANT. MISSING	8.00	.00	7.19	1.64	6.66	1.36
POST. MISSING	11.00	.00	14.38	1.59	13.65	1.79
FILLED TEETH	1.00	.00	1.25	1.34	1.12	1.65
DMFT	28.00	.00	24.31	2.57	22.42	2.79
BLEEDING	4.00	.00	2.81	2.79	2.76	3.11
CALCULUS	5.60	.00	4.10	4.40	3.20	3.00
POCKET	.00	.00	.86	1.50	.36	.99
GING. RECESSION (2mm)	.00	.00	.19	.40	.39	.99
GING. RECESSION (+2mm)	.00	.00	1.88	1.89	1.86	2.55
MOBILITY	.00	.00	.13	.25	.08	.21
BUCCAL ATTRITION	.00	.00	.00	.00	.00	.02
OCCLUSAL ATTRITION	.00	.00	.00	.00	.00	.02
BUCCAL STAIN	.00	.00	.00	.00	.19	.77
ENAMEL DEFECTS	.00	.00	.00	.00	.00	.03

Table AP15.21. Mean scores of clinical status of those who wear a full upper denture in each group of satisfaction in the eating restriction dimension after factor analysis (n=91).

	UNSATISFIED (n= 1)		RELATIVELY SATISFIED (n= 6)		SATISFIED (n= 84)	
	MEAN	SD	MEAN	SD	MEAN	SD
DECAYED TEETH	.00	.00	1.50	1.05	1.16	1.49
MISSING TEETH	19.00	.00	21.50	3.56	20.37	2.38
ANT. MISSING	6.00	.00	8.17	1.83	6.61	1.22
POST. MISSING	13.00	.00	13.33	2.07	13.76	1.78
FILLED TEETH	3.00	.00	1.17	1.60	1.13	1.60
DMFT	22.00	.00	24.17	2.71	22.66	2.85
BLEEDING	4.00	.00	3.50	3.39	2.75	3.03
CALCULUS	5.00	.00	4.00	4.00	3.20	3.40
POCKET	3.00	.00	1.50	1.97	.35	.96
GING. RECEDITION (2mm)	1.00	.00	.33	.82	.35	.93
GING. RECEDITION (+2mm)	4.00	.00	1.83	2.04	1.84	2.48
MOBILITY	.33	.00	.36	.45	.06	.18
BUCCAL ATTRITION	.00	.00	.00	.00	.00	.02
OCCLUSAL ATTRITION	.00	.00	.00	.00	.03	.16
BUCCAL STAIN	.00	.00	.00	.00	.17	.73
ENAMEL DEFECTS	.00	.00	.00	.02	.08	.25