

**DO COMPLETE DENTURES IMPROVE THE QUALITY OF
LIFE OF PATIENTS?**

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A thesis submitted for fulfillment of the requirements for the Degree
of Magister Scientiae (MSc) in the Department of Restorative
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Cape.

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KEYWORDS

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Physical disability

Psychological disability

Social disability

Handicap

Denture satisfaction



ABSTRACT

Do Complete Dentures Improve the Quality of Life of Patients?

RZ Adam. MSc Thesis, Dept of Restorative Dentistry, University of the Western Cape.

Few studies have documented the impact of complete dentures on patients' oral health-related quality of life.

Objectives: The purpose of this study was to investigate the relationship between gender, age, socioeconomic status and denture satisfaction and oral health-related quality of life. **Method:** A descriptive study was conducted with a sample of 63 patients. These patients were selected from the waiting list for complete dentures at the Tygerberg Oral Health Center. All patients completed an informed consent form and were interviewed using the OHIP-EDENT (Oral Health Impact Profile for Edentulous Patients). Patients also completed a global rating of satisfaction for their maxillary and mandibular dentures respectively using a Likert scale response. **Results:** 19% of the sample population was male. Statistical analyses comparing gender, employment and education with the oral health-related quality of life demonstrated a weak relationship. However, a significant relationship was found between age and oral health-related quality of life, with patients younger than 60 years having higher impact scores in the *psychological disability* and *social disability* domains than patients older than 60 years. Patients who were dissatisfied with their maxillary and mandibular dentures scored significantly higher in

all domains compared to patients who were satisfied. There was also an improvement in OHIP-EDENT scores following placement of new complete dentures. **Conclusions:** This study shows that levels of denture satisfaction are significantly related to oral health-related quality of life and that new complete dentures influence the oral health-related quality of life of patients.



DECLARATION

I declare that "Do Complete Dentures Improve the Quality of Life of Patients?" is my own work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references.

Razia Zulfikar Adam

March 2006

Signed:.....



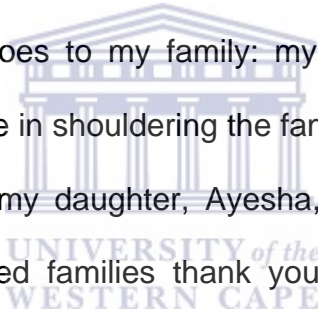
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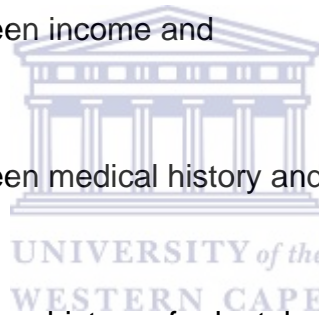


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INTRODUCTION

The World Health Organisation (WHO) defines health as “a state of complete physical, mental and social well being, not merely the absence of disease or infirmity” (WHO, 1980). This modern approach to health lends itself to oral health as well.

The use of patient-based outcome measures in oral health, like oral health-related quality of life (OHRQOL), has increased since the 1980's. OHRQOL is a multi-dimensional idea which can be defined as a person's assessment of how functional, psychological, social factors, pain or discomfort affect his/her well being- in the context of oral health (Strassburger et al, 2004).



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Outcomes in prosthetic therapy has focused mainly on the superior results of mandibular overdentures or fixed prosthesis as opposed to conventional complete dentures (Heydecke et al, 2003; Allen and McMillan, 2001; Awad et al, 2000). While implant-retained dentures provide a viable alternative for most patients in the developed countries, in South Africa the cost is prohibitive to the average edentulous patient.

Allen and McMillan (2003) found that patients who choose to replace complete dentures and partial dentures with implant-retained dentures have a poor OHRQOL and some of these issues remain post-treatment. However, patients who seek to replace their existing complete dentures

with new complete dentures have a better OHRQOL than those seeking implant-retained dentures. They suggest that these patients are best left with conventional dentures even though implant-retained dentures may provide more stability and retention.

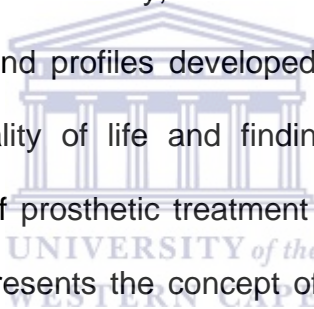
Locally, conventional complete dentures are a more cost-effective treatment option for edentulous patients. With a 20-30% prevalence of edentulousness in the Western Cape, determining the impact of complete dentures on the edentulous patient's OHRQOL may be prudent in allocating health resources, assessing treatment outcomes and highlighting concepts of health and significance of patient perspectives in educational programmes (Naidoo et al et al, 2001).

This study aims to determine whether complete dentures improve the quality of life of an edentulous patient, and will also assess the roles of socioeconomic and demographic factors. The study will further assess the association between psychosocial, socioeconomic and demographic factors and patients' level of denture satisfaction.

CHAPTER 1

LITERATURE REVIEW

This chapter covers key themes from the literature, which highlight factors that may play a role in an edentulous patient's OHRQOL. Firstly, the literature provides a background of the trends in tooth loss and complete dentures both globally and in South Africa. Findings of local surveys are presented. Secondly, a description and discussion on the impact of tooth loss is presented. This is followed by an overview of the social impact of disease and the development of a more holistic approach to health and more specifically oral disease. Thirdly, the review provides a description of commonly used indices and profiles developed to assess the impact of dental conditions on quality of life and findings of previous research investigating the impact of prosthetic treatment on a patient's OHRQOL. Finally, the review also presents the concept of denture satisfaction and factors that play a role in determining patient's satisfaction with complete dentures.



1.1 Aging, tooth loss and complete dentures worldwide

The number of older people in both developing and developed countries will increase over the coming decades (WHO, 2003). Between 2000 and 2030, the number of people aged 55 and over will increase from 59 million to 108 million in the USA, from 15.5 to 22.7 million in the UK, from 32.6 to 43.6 million in Russia, from 175 million to 456 million in China, from 37.9 million to 50.7 million in Japan, from 6 million to 15 million in Egypt and from 7 to 12 million in Argentina (WHO, 2003).

Improvements in preventative programmes throughout the developed world have led to a decrease in tooth loss (WHO, 2003). Table 1 shows that the percentage of the population with complete tooth loss, while decreasing over time, still increases with age (WHO, 2003). This phenomenon of world aging is affecting most of the developed world except sub-Saharan Africa. This may be attributed to declines in fertility and increasing life expectancy.

As a result a significant number of older patients will still be experiencing some form of tooth loss. It has been estimated that more than half of Canadians over the age of 65 years are missing all their teeth (Awad et al, 2003b). A third of the Americans over the age of 65 years are edentulous. Furthermore, several European countries, United Kingdom (46%), The Netherlands (65%) and Iceland (69%) have a high prevalence of edentulism (Awad et al, 2003b).

Table 1 Prevalence of edentulousness (%) of elderly reported for selected countries throughout the world (Source: WHO Global Oral Health Data Bank and WHO Oral Health Country/Area Profile Programme, 2000)^{3,4}.

WHO region/country	Pct Edentulous	Age group (yrs)
Africa		
Gambia	6	65+
Madagascar	25	65-74
The Americas		
Canada	58	65+
USA	26	65-69
Eastern Mediterranean		
Egypt	7	65+
Lebanon	20	64-75
Saudi Arabia	31-46	65+
Europe		
Albania	69	65+
Austria	15	65-74
Bosnia and Herzegovina	78	65+
Bulgaria	53	65+
Denmark	27	65-74
Finland	41	65+
Hungary	27	65-74
Iceland	15	65-74
Italy	19	65-74
Lithuania	14	65-74
Poland	25	65-74
Romania	26	65-74
Slovakia	44	65-74
Slovenia	16	65+
United Kingdom	46	65+
South-East Asia		
India	19	65-74
Indonesia	24	65+
Sri Lanka	37	65-74
Thailand	16	65+
Western Pacific		
Cambodia	13	65-74
China	11	65-74
Malaysia	57	65+
Singapore	21	65+

Data from the 1998 United Kingdom Survey of Adult Dental Health shows that in the UK well over half of the population with 1-20 natural teeth and 17% of the population with 21-24 teeth wear partial dentures (Treasure et al, 2001). These figures show that a substantial proportion of adults will still need prosthodontic treatment.

Contrary to the abovementioned findings, Weintraub and Burt (1985) found in their review of national studies that tooth loss and edentulousness would continue to decline despite the aging population. Decreasing edentulism in industrialised countries has been attributed to economic welfare, changes in attitude towards oral health, the use of fluoride and increasing availability of health care services.

While parallel improvements have been made in the use of implant-retained dentures, many older people are still unable to afford them.

This study will attempt to examine the effects of wearing complete dentures on a patient's' day to day activities from a patient's perspective.

1.2 The South African perspective

Most of the investigations involving prosthetic treatment have been conducted in developed countries (Hartshorne, 1998). There is a lack of prosthetic epidemiological data in most developing countries. South African data has been limited to a few cross-sectional surveys conducted in convenient samples of the elderly in the Western Cape population (Van Wyk et al, 1977 and Watermeyer et al, 1981). Local surveys that pertain to denture status and treatment needs and demands, address mostly the problems of the urban Coloured with special emphasis on the elderly and institutionalized groups (Van Wyk et al, 1977; Louw and Moola, 1979; Watermeyer et al, 1981; Carstens et al, 1995).

Louw and Moola (1979) reported a high prevalence of edentulousness (56.8%) amongst the Cape Coloured (ages 35-44 years) and that the greatest need for complete dentures existed in the low socioeconomic and education groups. Females were also more likely to be edentulous at all age levels.

Very few studies were conducted on the White population. Watermeyer et al (1981) found in their study on elderly Whites in the Cape Peninsula that 5% were not wearing any dentures. The relatively low percentage of Whites not possessing dentures may be attributed to the fact that they had access to oral health care and could afford dentures.

Louw (1982) conducted a study to determine the dental needs and demands of the Coloured population of the Cape Peninsula. He found that 27% of the sample in the Coloured population in the Cape Peninsula had complete dentures. His findings also confirmed that of previous studies (Van Wyk et al, 1977; Louw and Moola, 1979) that females and subjects from a lower socioeconomic group were more likely to be edentulous.

Data from the National Oral Health Survey (NOHS) of 1989 (Naude et al, 1994) reported on the prosthetic status and treatment needs of the adult population. The survey was conducted with representative samples of adults (ages 20-64 years) in the five regions of South Africa including three rural areas. Du Plessis et al (1989) found that the Coloured population had the highest prevalence (25%) of edentulousness, followed by the Whites (18%), Indians (2%), urban Blacks (2%) and rural Blacks (1%). It was expected for the lower socio-economic group to have the highest prevalence of edentulousness. Lack of healthcare facilities may explain this discrepancy.

The findings of the 1989 NOHS showed the same pattern as previous studies discussed. Edentulousness increased with increasing age and was more prevalent in females.

A survey of the farm-working Coloured population in the Boland region showed that 28% of adults between the age of 20-44 years and 9% of

those 45 years and older had complete dentures (Carstens et al, 1995). Approximately 75% of the farm workers had no dentures. Possible explanations for the low prevalence of dentures in the Coloured population are the high costs involved, lack of transport, limited time for treatment, absence of perceived need and unavailability of services and/or resources (Carstens et al, 1995). Cultural values where edentulousness without a denture is the norm may also be a contributing factor.

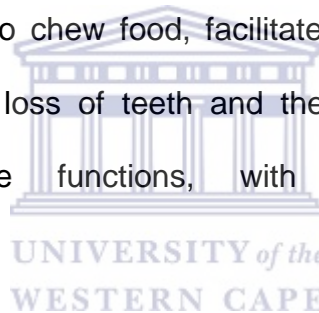
The 1998 Demographic and Oral Health Survey (DOHS) reported on the perceptions of oral health of adults 15 years and older in South Africa (Naidoo et al, 2001). The highest rate of edentulousness was reported for Coloured men and women (58%), followed by the White men and women (45%) and Asian men and women (13%). Black men and women (7%) reported the lowest prevalence of edentulousness. These findings confirm studies conducted by Louw and Moola (1979), Naude et al (1994) and Hartshorne (1998). Edentulousness amongst the Western Cape population was the highest (32%). This was followed by the Northern Cape (15%) and the Eastern Cape (10%). The Northern Province reported the lowest rate of edentulousness (2%). As expected, edentulousness increased with increasing age, females were more likely to be edentulous and subjects with a higher education reported lower rates of edentulism.

In a study conducted by Hartshorne (1998), 43% of the overall representative sample in the Western Cape was edentulous. The highest

rate of edentulousness was found in the Boland (46%) and South Cape health region (49%). Fifty percent of Whites, 35% of Coloureds and 9% of the Blacks wore complete dentures. The prevalence in this study was greater in all the population groups when compared with the findings of Naude et al (1994). These findings also supported previous studies that found edentulousness more often associated with the elderly, less educated, poor, rural inhabitants and women (Louw and Moola, 1979; Hartshorne, 1998).

1.3 The impact of tooth loss

The function of teeth is to chew food, facilitate speech and to enhance facial appearance. The loss of teeth and their supporting tissue may adversely affect these functions, with possible psychosocial consequences.



1.3.1 Anatomical changes following tooth loss

The anatomical changes taking place after tooth loss may be described as extraoral and intraoral.

Intraoral changes: Following total tooth loss, the height and width of the alveolar bone decreases. Bergman and Carlsson (1964) found that bone loss is a continuous process throughout life. Tallgren (1969) demonstrated that bone loss in edentulous patients is four times greater in the mandible than in the maxilla. Atwood (1971) described the reduction of residual

ridges as “a major oral disease entity” and attributed it to a variety of factors including anatomical, metabolic, functional and prosthodontic aspects.

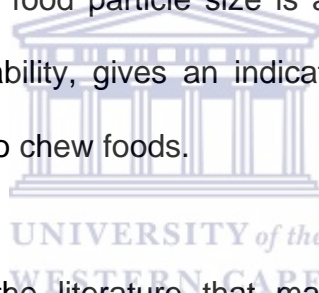
Reduced residual ridges leads to a decrease in the size of the denture-bearing area resulting in problems with denture stability especially in the mandible. Alveolar bone is replaced with fibrous tissue in the anterior maxilla region, which may prevent upper denture stability. Anatomical structures such as the mylohyoid ridge and genial tubercles become more prominent. The overlying mucosa is incapable of handling stresses.

Extraoral changes: Facial appearance can be radically affected by tooth loss. The natural teeth and the surrounding alveolar bone support the circumoral musculature. The occlusal facial height determined by teeth also changes. Tallgren (1969) compared lateral cephalograms of edentulous subjects with a group of subjects who were edentulous in the maxilla and partially dentate in the mandible. In this seven year follow-up study, it was found that edentulous patients experienced a greater loss of facial height compared to the partially dentate group. This indicated a benefit of retaining some natural teeth in the mandible. Tallgren (1969) recommended that as the mandible showed no appreciable reduction in the partially dentate group, teeth should be preserved if possible. The loss of alveolar bone height and width also resulted in marked changes in soft-tissue profile, particularly in the first follow-up year of tooth extraction.

Tallgren et al (1991) used profile cephalometric radiographs to monitor the changes in lip profile in patients receiving complete immediate dentures. During a two-year period, continuing residual ridge reduction led to pronounced protrusion of the lower lip and chin. Loss of vertical dimension is also associated with poor maintenance of complete dentures.

1.3.2 Masticatory ability

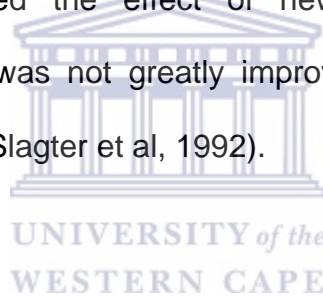
The ability to chew food can be assessed using objective tests of masticatory performance or subjective assessment of masticatory ability. In testing masticatory performance, various test foods are given to subjects to chew and the food particle size is analysed using laboratory techniques. Masticatory ability, gives an indication of the subjects' own perception of their ability to chew foods.



There is consensus in the literature that masticatory performance of edentulous subjects is less than dentate subjects. Wayler and Chauncey (1983) found that complete dentures wearers experienced more difficulty chewing hard food than dentate subjects. Osteberg et al (1996) and Heath (1982) corroborated this. They found that the masticatory performance of edentulous individuals was one-sixth of that achieved by dentate individuals. A weakness of these studies was that the control subjects were young dentate individuals. Decreased masticatory performance could be related to age as well as dental status.

Helkimo et al (1977), Haraldson et al (1979) and Michael et al (1990) assessed the bite force of complete denture wearers. When compared with dentate individuals, individuals wearing complete dentures had a bite force only 20% that of dentate individuals. This could partly explain why individuals wearing complete dentures experience difficulty chewing foods. Agerberg and Carlsson (1981) assessed masticatory ability by administering a questionnaire to both dentate and edentulous individuals. They found that only 8% of edentulous subjects rated their chewing efficiency as poor.

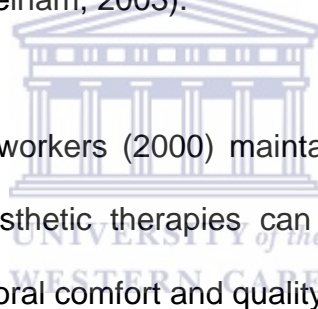
In studies that evaluated the effect of new dentures, masticatory performance and ability was not greatly improved (Gunne et al, 1982; Lindquist et al, 1986 and Slagter et al, 1992).



1.3.3 Dietary selection

Studies of nutrition in adult populations have reported that adults wearing partial or complete dentures have poor-quality diets (Sandstrom and Lindquist, 1987; Sebring et al, 1995). This could be because the older patient finds it difficult to chew raw vegetables and fruit and has a diminished sense of taste. Treasure et al (2001) found that the dentate individuals' diet consisted of higher daily intakes of protein, fibre, calcium, iron and vitamin C compared to the edentulous adults. Other strong influences on dietary selection include age, socioeconomic status and general health.

Some studies have looked at the relationship between nutrition and the quality of replacement complete dentures and implant prostheses (Sandstrom and Lindquist, 1987; Sebring et al, 1995). They found that edentulous patients' diets remained low in fibre and high in fat. When food choice is affected by the dentition, the foods selected are those detrimental to health, with the potential to increase morbidity; there is an increased intake of cholesterol, saturated fat, and total carbohydrate (Owen and Locker, 2003). In a study conducted in the North American adult population, they found that denture wearers had significantly lower intakes of some nutrient-rich foods and beta-carotene, folate and vitamin C (Nowjack-Raymer and Sheiham, 2003).



Budtz-Jorgensen and co-workers (2000) maintain, “there is no evidence that the provision of prosthetic therapies can improve dietary intakes, however it might improve oral comfort and quality of life”.

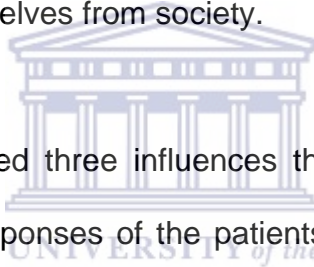
1.3.4 Psychosocial consequences of tooth loss

The WHO provided a classification of impairment, disability and handicap (WHO, 1980). Impairment is described as “the loss of an anatomic body part”; disability is defined as “being prevented from partaking in everyday activities such as chewing and speaking” and handicap describes broader social effects, such as “minimised contact with people”. The loss of all the natural teeth may lead to impairment, disability and handicap.

Many adults learn to accept and overcome the limitations of dentures with time.

In his study on patients' adaptive responses to complete dentures, Friedman et al (1987,1988) described 3 classes of adaptive responses to complete dentures:

- Class 1: patients who can adapt physically but not emotionally;
- Class 2: patients who cannot adapt physically or emotionally;
- Class 3: patients who cannot and do not wear dentures, who are chronically depressed, and who isolate themselves from society.



The authors also described three influences they believe may have an effect on the adaptive responses of the patients. Parental influence may affect how individuals see themselves and their teeth. Teeth may also have a symbolic significance; loss of teeth may reflect impending loss of virility, loss of facial attractiveness and body degeneration. Current life circumstances may also influence the response to tooth loss. Strong extraneous influences such as a recent bereavement; unemployment or a diagnosis of a life-threatening illness may seriously compromise an individual's ability to accept the loss of teeth.

Fiske et al (1998) assessed the emotional effects of tooth loss. Common themes from this study were feelings of bereavement, lowered self-confidence, altered self-image, dislike of appearance, inability to discuss

the subject, concern about dignity, altered behavior in socialising and forming close relationships, and premature aging. They concluded that tooth loss might profoundly affect the psychosocial wellbeing of patients, as well as those who are coping well with dentures.

In a study conducted in elderly people in Hong Kong (McMillan and Wong, 2004), 95% stated that their confidence was unaffected while 22% reported difficulty accepting tooth loss. Both edentulous and partially dentate individuals, because of restrictions on daily activities, experienced significant disability.

1.4 The social impact of oral disease

1.4.1 Developing the socio-dental Indicators

In the mid-19th century European governments began collecting data on death and the causes of death. While mortality statistics continued to be important, they did not take into account the illness that results in death and the disability or distress that may be caused by illness. Treatment needs have been defined in clinical terms. None of these included the social and psychological aspects of dental disease. They did not include an assessment of preventive need to reduce the development of future disease or information on the perceived dental health status and needs of the population (Cushing et al, 1986). Major research efforts used days of work lost as a result of dental and oral disease as a socio-dental indicator.

A major drawback was that it did not measure the psychological impacts of oral disease.

As a result of social and environmental change, the concept of health was broadened and recognised to be multidimensional. It not only involved the absence or presence of disease but also its social and psychological consequences (WHO, 1980).

While the medical literature is quite extensive on the subject, dentistry has remained clinical until the last decade. In an attempt to translate this definition into practical objectives, a workshop was held in Oslo, Norway in 1982 (Cushing et al, 1986). The objective of this workshop was to provide suggestions for levels of health in the European population to be achieved by the year 2000. The International Collaborative Study conducted by the WHO in 1982, revealed that those countries with the highest levels of satisfaction with oral health status among the population were those with the highest levels of edentulousness (Cushing et al, 1986). These findings highlighted the limitations of relying on clinical parameters alone and the need to better understand the social and psychological factors that influence dental health outcomes (Cushing et al, 1986). One method of assessing perceptions of oral health is to determine the impact dental status has on people.

In the review of socio-dental indicators, Reisine (1981) revealed that research data available on the social impact of oral disease was limited

and related mainly to acute dental episodes that led to a disruption of normal activities. The non-acute dental conditions such as dentofacial anomalies and malocclusions received some attention regarding the social and psychological consequences of their conditions.

Cushing et al (1986) attempted to develop socio-dental indicators in terms of pain, anxiety and dysfunction. Subjects completed a questionnaire and were clinically examined. The examination included an assessment of prosthetic, caries and periodontal status and treatment needs. They used the criteria explained by the WHO Basic Survey Methods (1977). A relatively high prevalence of social and psychological impacts was experienced by the sample as a result of dental disease. Subjects wearing partial dentures and complete dentures experienced more difficulties eating than their dentate counterparts. They were also more likely to be dissatisfied with their appearance than the dentate subjects were.

Reisine et al (1989) looked at the impact of common but serious dental conditions, v.i.z. recurrent periodontitis, temporomandibular joint problems (TMJ) and denture replacement on the patient's life. They used quality of life indicators such as the Sickness Impact Profile, the Gill-Well Being Scale and a modified McGill Pain Questionnaire to assess the impact of dental conditions. Denture patients reported considerable impacts in the Sickness Impact Profile with approximately a quarter of them reporting problems in home tasks, social and leisure tasks. The denture patients

also scored higher in terms of reporting pain (91%). Denture (26%) and TMJ (37%) patients experienced the most discomfort from chewing.

Research has demonstrated that oral disease places a significant burden on both individual and community. Others were now looking at developing scales to measure the impact of oral disease. The different indices available are described in detail elsewhere in this document. The general approach in developing a questionnaire involved identifying a conceptual model. An existing model of oral health was used to identify conceptual domains in the hierarchy of social impact.

1.4.2 Locker's conceptual model

Wood (1980) defined concepts such as impairment, functional limitation, disability and handicap. These identified the personal and social consequences of disease. A broader range of concepts, which included death, disease, disability, discomfort and dissatisfaction emerged later (Wood, 1980).

Locker's conceptual model (see Figure 1) is an adaptation of the model adopted by the WHO as part of the International Classification of Impairments, Disabilities and Handicaps (WHO, 1980). The diagram illustrates the relationships between the different concepts of the overall model. Smith and Sheiham (1980) applied the model to dental and oral conditions. Elderly patients wearing poor and ill-fitting dentures were

interviewed, 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 struggled to eat foods of their choice and found it took longer to complete a meal detracting from their pleasure in eating, causing embarrassment and deterring them from eating with others (handicap). In this way dental and oral conditions have a negative impact on patients' quality of life and may lead to social and psychological deprivation.



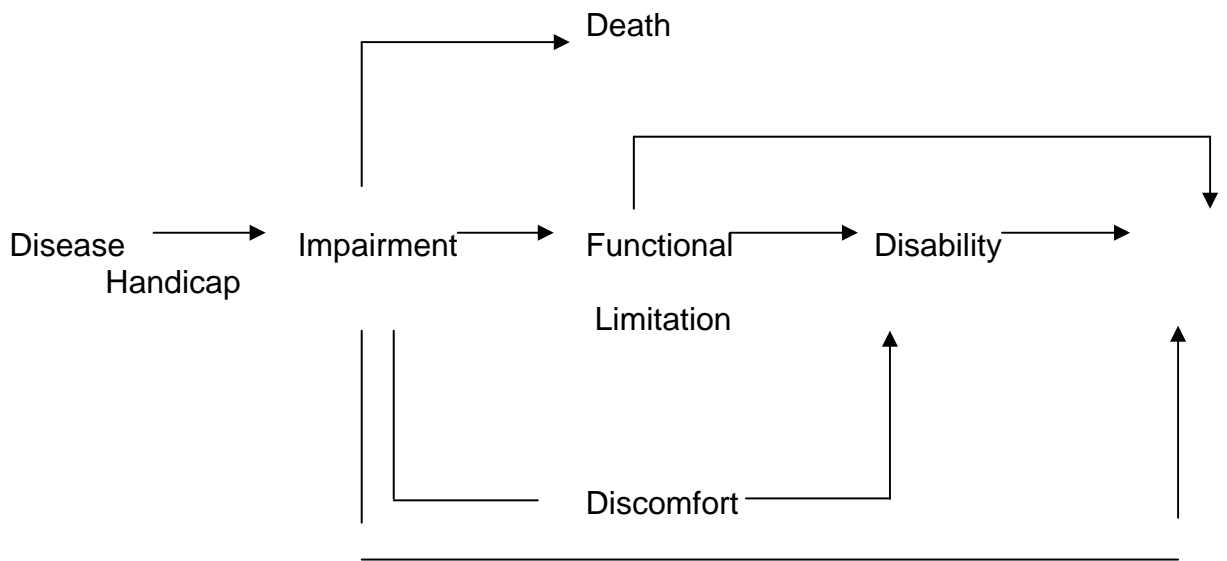


Figure 1: Locker's conceptual model



1.5 Quality of life and dentistry

1.5.1 Introduction

The extension of peoples' lifespan and the enhancement of their quality of life are two central goals of health care systems as reflected in policies developed by the United States Government and the World Health Organisation (Slade et al, 1998). In an article by Cushing et al (1986), Lembcke stated "the best measure of quality is not how well, or how frequently a medical service is given, but how closely the result approaches the fundamental objectives of prolonging life, relieving distress, restoring function and preventing disability". Since the majority of dental care is directed towards disease that is seldom life threatening, there has been a need to evaluate the impact of dental care on the quality of life.



By 1995, some 11 instruments measuring oral health related could be identified in the literature (see Table 2).

While many of the studies conducted thus far were mainly cross-sectional surveys, few had been used to evaluate the outcomes of dental treatment. Consequently, a conference was organised to assess the use of oral health related instruments in Chapel Hill, North Carolina in June 1996 (Slade et al, 1998). The findings of the conference were that there was an urgent need to evaluate the performance of these instruments in longitudinal and intervention studies. The cross-sectional studies

conducted thus far do not indicate whether the instruments are sensitive to changes following dental treatment (Slade et al, 1998). Another issue that emerged was how the results should be combined with clinical, functional, social and economic outcomes to evaluate effectiveness of health care (Slade et al, 1998).



**Table 2 Summary of instruments used to evaluate oral health related quality of life
(Slade et al, 1998)**

<i>Authors, reference</i>	<i>Name of instruments / no. of items</i>	<i>Examples of dimensions</i>	<i>Application of instruments</i>
Cushing <i>et al</i> , 1986	Sociodental Scale/ 14	Chewing, talking, smiling, laughing, pain, appearance	Cross-sectional; Intervention
Slade <i>et al</i> , 1998	RAND Dental Health Index/ 3	Pain, worry, conversation	Cross-sectional
Reisine <i>et al</i> , 1989	Sickness Impact Profile/7 subscales=73 items	Rest, home tasks, social interaction, speech, intellectual, work, leisure	Intervention
Atchison and Dolan, 1990	Geriatric Oral Health Assessment Index/12	Chewing, social contacts, eating, appearance, pain, worry, self-consciousness	Cross-sectional; Longitudinal Intervention
Strauss and Hunt, 1993	Dental Impact Profile/25	Appearance, eating, speech, confidence, happiness, social life, relationships	Cross-sectional
Slade and Spencer, 1994	Oral Health Impact Profile/49	Function, pain, physical disability, psychological disability, social disability, handicap	Cross-sectional; Longitudinal screening
Slade <i>et al</i> , 1998	Subjective Oral Health Status Indicators/42	Chewing, speaking, symptoms, eating, communications, social relations	Cross-sectional
Slade <i>et al</i> , 1998	Oral Health Quality of Life Inventory/56	Oral health (15 items), nutrition, self-rated oral health, overall quality of life	Cross-sectional
Slade <i>et al</i> , 1998	Dental Impact on Daily Living/36	Comfort, appearance, pain, daily activities, eating	Cross-sectional
Slade <i>et al</i> , 1998	Oral Health –related Quality of life	Daily activities, social activities, conversation	Cross-sectional
Slade <i>et al</i> , 1998	Oral Impacts on Daily Performance	Performance in eating, speaking, oral hygiene, sleeping, appearance, emotion	Cross-sectional

1.5.2 Indices and profiles

1.5.2.1 Social Impact of Dental Disease (SIDDD) (Cushing et al, 1986)

This instrument focuses on four or five categories of impacts, and does not gauge the severity of the impact. Categories include function (eating), social interaction (communication), comfort and well being (pain plus or minus discomfort) and self-image (aesthetics). Each category consists of 2-6 items; a positive score on any of the items is scored as a positive for the entire category. SIDDD has good test- retest reliability; worse scores are related to wearing partial dentures and having a low mean number of functional teeth.

1.5.2.2 RAND Dental Health Index (Slade et al, 1998)

The RAND Dental Health Index is a three-item measure; assessing pain with teeth and gums, worry from pain or teeth, and conversation avoidance due to problems with teeth or gums. The three-items are used separately or together to form a three-item scale; this scale is modestly related to indices of general health perceptions, mental health, personal functioning and role limitations.

1.5.2.3 Sickness Impact Profile (Reisine et al, 1989)

Seven subscales were used, including rest and sleep, intellectual functioning, social interaction, home tasks, leisure activity, work and communication. A scale score was calculated for each subscale in addition to a total score.

1.5.2.4 Geriatric Oral Health Assessment Index (GOHAI) (Atchison and Dolan, 1990)

This 12-item instrument is intended to evaluate functional status, pain and discomfort, worry, ability to chew and swallow, and social functioning. In initial testing GOHAI had acceptable reliability and validity and correlated with self-reported dental status and number of teeth. However, a weak correlation was found with tooth mobility, root caries, coronal caries, number of pathological conditions and an index of oral hygiene.

1.5.2.5 Dental Impact Profile (Strauss and Hunt, 1993)

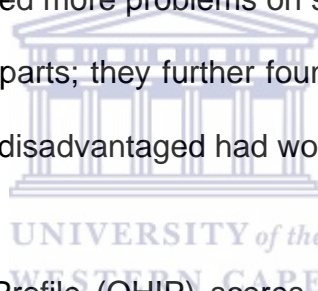
It is a simple and easy instrument to use that addresses how natural teeth and/or dentures either positively or negatively affect social, psychological and biological functions of quality of life. Twenty-five items in four subscales assess the effects of the teeth or mouth on eating, health and well being, social relations and romance.

1.5.2.6 Oral Health Impact Profile (OHIP)(Slade and Spencer, 1994)

This instrument is developed by Slade and Spencer (1994), based on a conceptual framework of oral disease and its functional and psychological consequences. The 49 items are divided into seven subscales, including functional limitation, pain, psychological discomfort, physical disability, psychological disability, social disability and disadvantage. For each of the 49 questions, the subjects are asked how frequently they have experienced the impact in the preceding 12 months. The responses are

made on a Likert-type scale and coded 4= very often, 3= fairly often, 2= occasionally, 1= hardly ever and 0= never. A Likert scale is a type of scale in which respondents indicate the level of agreement with statements that express a favourable or unfavourable attitude towards a concept being measured. These responses are then weighted using Thurstone's statistical method of paired comparisons to reflect the importance of each statement.

This instrument was used in a study conducted in Ontario, Canada in a sample of older adults (Slade and Spencer, 1994). They found that edentulous patients reported more problems on six of the seven subscales than their dentate counterparts; they further found that persons who were economically and socially disadvantaged had worse scores for oral health.



The Oral Health Impact Profile (OHIP) scores may be derived in a few ways. A study by Allen and McMillan (2001) found that the weight-standardised method had the least sensitivity to change. They concluded that this could be due to the difference in oral perceptions in the UK population and the Australian population. However, Allison et al (1999) found that the OHIP had a reasonably good cross-cultural consistency as pertaining to English- and French-speaking Canadians, North Americans and Australians.

The OHIP constituted of 49 lengthy questions and partly for this reason there was a need to develop a shorter derivative, the OHIP-14 (Slade, 1997). The OHIP-14 proves to have good statistical properties and validity in the cross-sectional setting. The benefit of using the OHIP-14 is that data can be collected using less fieldwork and respondent burden (Slade, 1997). However, statements relevant to denture-wearing were excluded to develop the OHIP-14. Allen and Locker (2002) found that improvements following clinical intervention could not be measured and that the shortened version did not include an item related to perceived chewing difficulty, a common problem for patients wearing removable dentures. As a result another shortened version of the OHIP was developed to be used in the prosthodontic setting, viz. the Oral Health Impact Profile for Edentulous Patients) (OHIP-EDENT) (Allen and Locker, 2002). The OHIP-EDENT included items related to perceived chewing difficulty. The OHIP-EDENT consists of 19 statements derived from the OHIP using an item impact method. It had good measurement properties, making it appropriate for use in the clinical settings (Allen and Locker, 2002).

Strassburger et al (2004) conducted a systematic review of the literature on the influence of prosthodontic and dental implant treatment on patient satisfaction and OHRQOL. Close to 59% reported on prosthetic therapy for completely edentulous subjects and 17% included implant-retained prosthetic devices. Eighty-two percent of these studies conducted used

custom-made instruments. Between 1990 and 2003, the OHIP was the most frequently used and best documented with 13 studies published.

I have decided to use the OHIP-EDENT to measure treatment outcomes because:

- Reliability and validity of the instrument has been proven;
- Cross-cultural consistency has been reported;
- The instrument is short and encompasses all issues affecting edentulous patients and
- Results following its use in the South African context have never been reported.

1.5.2.7 Oral Health Quality of Life Inventory (Slade et al, 1998)

This 15-item instrument evaluated six different dimensions, i.e. taste and salivary function, dento-facial aesthetics, general oral health and functional status, dento-facial pain, speech, chewing and swallowing.

1.5.2.8 Psychosocial Impact Score (Slade et al, 1998)

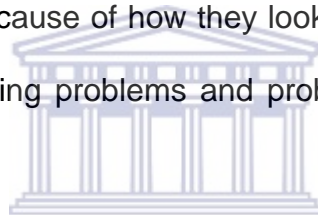
Locker and Miller developed a set of subjective oral health status indicators assessing eight dimensions including chewing capacity, ability to speak clearly, oral and facial pain, other oral symptoms, problems with eating, problems in communication and social relations, limitations in daily activities and worry or concern about oral health.

1.5.2.9 Dental Impact of Daily Living (DIDL) (Slade et al, 1998)

DIDL is a 36-item instrument measuring five dimensions of oral quality of life: comfort, appearance, pain performance (ability to carry out daily activities) and eating restriction. Individual items are scored to give a weighted importance score: the dimensions may be used separately or aggregated into a total score.

1.5.2.10 Oral Health-related Quality of Life (Slade et al, 1998)

The three-item quality of life measure assesses how often problems with teeth or gums affect daily activities and social activities, or cause a person to avoid conversations because of how they look. It is able to discriminate the level of oral pain, eating problems and problem-based use of dental care.



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1.5.2.11 Oral Impacts on Daily Performance (OIDP) (Slade et al, 1998)

This index consists of eight physical, psychological and social performances, i.e. eating and enjoying food, speaking and pronouncing clearly, cleaning teeth, sleeping and relaxing, smiling, laughing and showing teeth without embarrassment, maintaining usual emotional state without being irritable, carrying out major work or social role, and enjoying contact with people. The scale measures both frequency and severity of the impact, which are multiplied and then summed for the eight items for the total score. It was found that persons with higher OIDP scores had poorer oral health as measured by the number of functional teeth,

decayed teeth, missing teeth and sextants with deep pockets (Slade et al, 1998).

1.5.3 Impact of dental conditions on patients' quality of life

In a study conducted by Cushing et al (1986), the predominant oral health impact amongst the dentate population was sensitivity to cold or food packing. Over a quarter of the respondents experienced toothache at the time of the study, while eating only affected one in every five respondents. There were no significant differences between men and women with regards to the prevalence of dental problems. Dental problems rarely impacted on their social and normal daily activities. Amongst the denture-wearing population they found that half experienced eating difficulties.

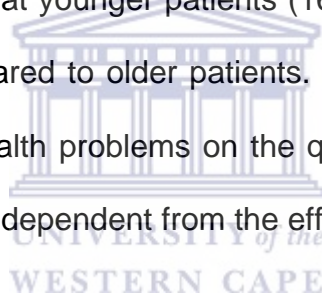
Reisine et al (1989) found that denture wearers experienced the most discomfort due to chewing. They also found that denture patients reported higher impacts in social interaction and daily tasks.

McGrath and Bedi (2001a) found that items relating to the physical/functional aspects of oral health were frequently considered as having the greatest impact as compared to social or psychological items, using the OHRQoL-UK (W)©. This instrument is copyrighted and it was impossible to establish any similarities or differences between it and the OHIP-EDENT. Thirty-five percent reported that eating had the greatest impact on their quality of life. A greater number of participants claimed that

oral health had a positive effect on their quality of life. This finding was in contrast to a study that reported that the majority of respondents did not perceive oral health as impacting on their quality of life (McGrath and Bedi, 2001b).

Chavers et al (2002) reported that African Americans, females, rural residents, individuals who did not graduate from high school and those with limited financial resources had significantly higher occurrences of oral disadvantage. Racial and gender disparities were largely explained by different approaches to dental care and financial resources.

John et al (2003) found that younger patients (16-49 yrs) reported a more impaired OHRQOL compared to older patients. Steele et al (2004) found that the impact of oral health problems on the quality of life reduces with increasing age, which is independent from the effect of tooth loss.



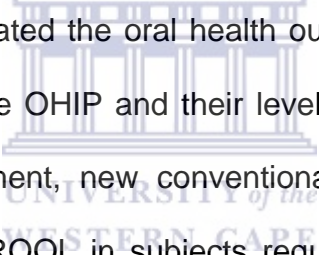
Females had a higher incidence of oral disadvantage due to disease/tissue damage and function compared to males (Chavers et al, 2002). However, no relationship was observed between gender and OHRQOL (John et al, 2003).

It was found that individuals who did not graduate from high school were more likely to report disadvantage due to pain than those who graduated (Chavers et al, 2002). Education as an indicator of socioeconomic status was weakly associated with OHRQOL in a national study in Germany to

determine the OHRQOL of its population (John et al, 2003). It was found that edentulous patients are more likely to have lower levels of education and come from poorer socioeconomic backgrounds and experience a greater impairment of oral health (Heydecke et al, 2004; John et al, 2004b).

1.5.4 Prosthetic treatment and oral health related-quality of life

McGrath and Bedi (2001b) found that subjects with considerable tooth loss and without recourse to dentures was an important predictor of OHRQOL and associated with a reduced quality of life.

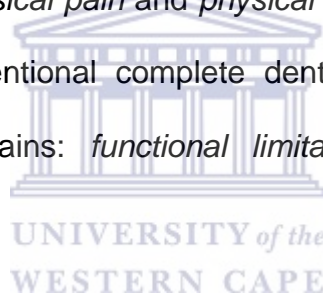


Allen et al (2001) investigated the oral health outcomes of three different treatment groups using the OHIP and their levels of denture satisfaction. Three months post-treatment, new conventional dentures had a more significant impact on OHRQOL in subjects requesting implant treatment than those that requested conventional complete dentures. At baseline, the highest scores were recorded in the *functional limitation* domain (Mean= 27.2) followed by *pain* (Mean= 19.5) and *physical disability* (Mean= 12.8). The post-treatment scores were not reported but the author reported overall improvements in their OHRQOL scores. The subjects who had requested and received implants reported similar results.

Heydecke et al (2003) conducted a study to compare the OHRQOL of subjects who had received implant overdentures or conventional complete

dentures prior to treatment and after treatment. They found that subjects who had received conventional dentures only improved on the *physical pain* and *psychological discomfort* domains whilst subjects who received implant overdentures showed significant positive change in all OHIP-EDENT domains. Post-treatment, the implant group had significantly higher scores for satisfaction, chewing ability, comfort, ability to speak and aesthetics.

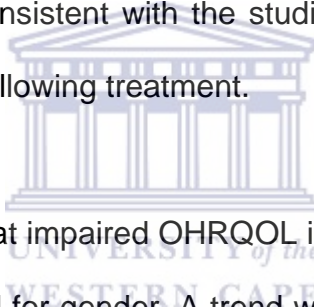
Awad et al (2003) using the OHIP-EDENT in subjects older than 75 years reported that those who had received implants scored lower impacts in *functional limitations*, *physical pain* and *physical disability* domains. Those who had received conventional complete dentures scored significantly lower in only two domains: *functional limitations* and *psychological discomfort*.



It has been found that functional limitations or pain in the orofacial area were more prevalent than impairments on items from the psychosocial scale OHIP domains (John et al, 2003; Heydecke et al, 2004). This could be attributed to ill-fitting dentures, inadequate retention and discomfort caused by complete dentures.

Many of the studies conducted thus far compare treatment outcomes of conventional complete dentures and implant-supported dentures using the

OHIP. The current study is unique in that it uses the OHIP-EDENT and is used solely to report on patients wearing conventional complete dentures. John et al (2004a) identified this paucity in the literature and conducted a study to describe the OHRQOL of patients before and after treatment with fixed, removable and complete dentures. They used the German version of the OHIP, the OHIP-G-49. Patients were interviewed one, six and twelve months after treatment. Subjects receiving complete dentures reported the highest impairment. The OHIP scores improved following treatment. The pre-treatment summary score of 29 dropped 13 units after one month of treatment and decreased further, to 6 at the second follow-up. These findings are consistent with the studies discussed earlier, that OHRQOL does improve following treatment.



John et al (2003) found that impaired OHRQOL increased with age and no differences were observed for gender. A trend was observed that younger patients reported more impairment than older patients. Education was used as an indicator of socio-economic status and was weakly associated with OHRQOL. In general, *functional limitations* and *pain* in the oro-facial area were more prevalent than impairments from the psychosocial domains.

Veyrone et al (2005) conducted a similar study using the French version of the Global Oral Health Assessment Index (GOHAI). Masticatory difficulties were reported by 81% of the participants. Only 8% of the sample was

dissatisfied with their appearance and more than half (54%) felt embarrassed when eating in front of others. Contrary to other studies, six weeks following treatment no improvement was measured in the GOHAI. Twelve weeks after placement of the complete dentures saw a significant improvement in the GOHAI scores. A relationship was found between the variation in GOHAI scores and denture satisfaction.

1.6 Denture satisfaction

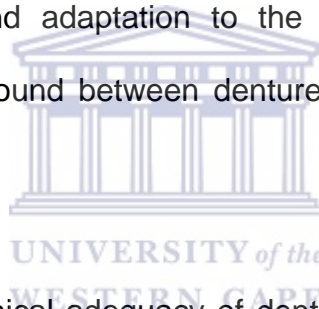
Denture dissatisfaction is a common phenomenon as 25% of denture wearers experience problems with complete dentures (Garrett et al, 1996; Berg, 1993; Van Waas, 1990b; Berg, 1988). Several causes of dissatisfaction with dentures are identified in the literature. In a study conducted by Van Waas (1990b) he identified the following causes: the attitude towards dentures, the quality of the dentures, the oral condition and the number of previous dentures worn. Other variables include the interpersonal relationship between the dentist and patient, the patient's personality and socioeconomic factors.

1.6.1 Denture quality

Few studies have been able to establish a relationship with denture quality and patient satisfaction (Fenlon and Sherriff, 2004; Wolff et al, 2003; Langer et al, 1961; Carlsson et al, 1967).

Denture quality is defined in relation to a number of factors, such as retention, stability, fit, vertical dimension, occlusion and aesthetics. All of these factors are difficult to assess and no generally accepted standards exist. Accordingly, the reliability and validity of these findings are doubtful.

Yoshizumi (1964) found a significant relationship between denture quality, comfort and a patient's ability to masticate. Van Waas (1990a) investigated the effect of the quality of the dentures in 130 patients at a dental school who had received new dentures. Three months post-insertion, the dentures were evaluated according to occlusion, arrangement of teeth and adaptation to the basal seat. A moderate positive correlation was found between denture satisfaction and denture quality.



Criteria exist for the technical adequacy of dentures but they do not give recognition to patient mediated factors such as hard and soft tissue responses and the opinion of the patient about the treatment (Guckes et al, 1978). Similar conclusions were drawn by studies conducted in South Africa. Naude et al (1989) and Hendricks et al (1996) found a relatively high degree of dissatisfaction of dentures across all population groups. The Black group had the lowest rate of satisfaction but was more distressed over tooth loss. The Whites and Coloureds showed the least distress and also showed the highest rate of denture satisfaction. This

contradicts the belief that subjects with a higher dental I.Q would attach more importance to retaining their own teeth than wearing dentures.

Hendricks et al (1996) compared patient satisfaction with measures of occlusion and stability as determined by the dentist. They found a discrepancy between patient satisfaction and dentists' evaluation of dentures.

1.6.2 Anatomic conditions

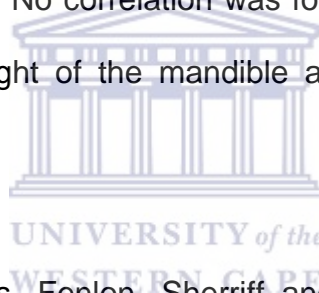
This study did not focus on anatomic conditions as a variable of denture satisfaction but an overview of the literature is provided for completeness.

The physical condition of the mouth and the functioning of the dentures are often mentioned in the literature. The most important factor is the contour of the alveolar ridge. As the ridges resorb there will be less resistance to displacement of the denture during function and the degree of retention and stability will gradually decrease. This is aggravated by the increase in the degree of resilience of the overlying mucoperiosteum (Berg, 1993).

Other factors mentioned include the thickness and resilience of the soft tissues; the size and shape of the tongue; the form and mobility of the border tissues; the tone of the muscles and the composition of the saliva (Van Waas, 1990b).

An early study by Carlsson et al (1967) found no relationship between the anatomic conditions and patients' appreciation of the dentures. Magnusson (1986) found significant correlations between denture satisfaction and qualities of the residual alveolar ridge in a five-year follow-up study.

Van Waas (1990a) conducted a study on patients receiving new dentures, to determine the influence of clinical variables on denture satisfaction. The study found that the condition of the mouth had no influence on patients' satisfaction with dentures. No correlation was found between assessment of the casts and the height of the mandible as measured on a lateral cephalogram.



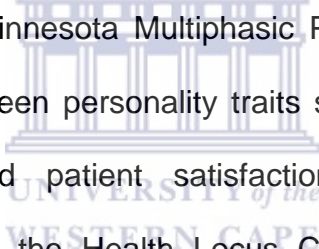
Contrary to other findings, Fenlon, Sherriff and Walter (2000) found a strong association between oral anatomy and denture satisfaction. Previous studies were confined to small samples, measurement methods were doubtful and only one or a few factors, which may influence treatment outcomes, were tested (Fenlon et al, 2000).

1.6.3 Psychological factors

A relationship between dentistry and psychology has long been recognised and attempts have been made to describe the psychological factors that require consideration in complete denture treatment (van

Waas, 1990c, Reeve et al, 1984; Bolender et al, 1969). To explore the relationship between denture satisfaction and a patient's personality, psychological tests are applied.

Bolender et al (1969) used the Cornell Medical Index and showed that patients with a high probability of emotional problems were not as satisfied with their dentures as those patients with less probability of problems. Reeve et al (1984) concluded that dissatisfied patients were less bright, less stable, more meticulous and more self-centered than satisfied patients.



Smith (1976) used the Minnesota Multiphasic Personality Inventory and found no correlation between personality traits such as hypochondriasis, hysteria, depression and patient satisfaction. Van Waas (1990c) conducted a study using the Health Locus Control Scale. This scale represents the extent to which, in a variety of health situations, individuals believe they have control over what happens to them. He found no relationship between dissatisfaction and the patient's personality. These results corresponded with the findings of Manne and Mehra (1983).

The lack of consistency in the results of these studies may be with regard to the purpose of these psychological tests. They are primarily designed to detect psychological tendencies rather than form the basis of a diagnosis

and not to differentiate between satisfied and dissatisfied denture patients (Berg, 1993).

1.6.4 Previous denture experience

The manner in which patients have adapted to previous dentures has been assumed to indicate their ability to adapt to new dentures. Weinstein et al's (1988) results indicated that the critical factor for predicting patient satisfaction was whether they had ever received previous complete dentures. Patients with no previous denture experience expressed a significantly lower degree of denture satisfaction compared to other patients. These results may be explained by a few reasons. Patients who have worn dentures previously are able to learn or reinforce the neuromuscular control required to stabilise a denture more rapidly than a patient who has no previous experience. Also, patients with previous experience may have more realistic aesthetic and psychosocial expectations. A weakness of this study was that the participants were all male.

Van Waas (1990a, 1990b) found no correlation between previous denture experience and satisfaction but acknowledged that future research may identify it as an important tool to determine patient satisfaction.

1.6.5 Demographic variables

A patient's general adaptive capacity tends to deteriorate with increasing age (Bergman and Carlsson, 1972). Based on this hypothesis, authors have reported that older patients require more adjustment visits and also exhibit a poorer denture acceptance than younger patients (Berg, 1993). Kotkin et al (1993) found that an increase in the patient's age decreased the ability to accommodate dentures. Weinstein et al (1988) and Mersel et al (1995) found that age did not influence the patient's denture satisfaction.

It is a commonly held opinion that female patients have greater difficulty adapting to dentures than their male counterparts. This could be because females have a poorer self-image than males in completely edentulous groups (Carr et al, 1985). Most studies show gender differences regarding satisfaction but lack statistical significance (Baer et al, 1992; Mersel et al, 1995).

SUMMARY OF LITERATURE REVIEW

The literature reviewed in this chapter has shown that while most developed countries are experiencing a decrease in the prevalence of edentulousness, South Africa still has a high rate of edentulousness and tooth loss. This may be attributed to a high rate of caries and periodontal disease and a low level of importance of oral health. It is important to note that the prevalence of edentulousness in South Africa is based on relatively old data due to a lack of more recent surveys.

Various researchers have identified factors that may be adversely affected by the loss of teeth. A growing interest in the impact of these changes on the patient's day-to-day activities meant that researchers were now also focusing on the psychosocial impact of oral disease. Numerous studies were conducted to assess the impact of dental conditions and to develop socio-dental indicators.

Most of these instruments concentrated on the dentate patient and did not address the problems that affected the edentulous patient. Consequently, the OHIP-EDENT (Allen and Locker, 2002) was developed to address their needs.

Numerous studies were conducted to assess the impact of prosthetic therapy on the OHRQOL. However, most studies conducted used the OHIP as their instrument of choice. Because this instrument was not

designed for use in edentulous patients results of these studies should be carefully interpreted.

Another drawback of these studies was that most concentrated on the impact of implant therapy in comparison to complete dentures as a treatment alternative. These studies reported an improvement of OHRQOL and denture satisfaction amongst complete denture patients but few reported on the relationships between the factors affecting them. No studies have been conducted in South Africa to assess the impact of complete denture therapy on patients' OHRQOL and denture satisfaction.

In order to assess the impact of complete denture treatment on the patient's OHRQOL, denture satisfaction was included. Previous researchers have explored factors affecting denture satisfaction. These factors have continued to vary and have made it difficult for researchers to define satisfaction, leaving it as a multidimensional model. Some of the factors discussed included, denture quality, anatomic conditions, psychological factors, previous denture experience and demographic factors.

Locally, few studies have looked at the factors affecting denture satisfaction. Previous researchers have reported a generally high rate of denture satisfaction.

CHAPTER 2

HYPOTHESIS AND OBJECTIVES

Hypothesis

Complete dentures improve the quality of life of patients

Objectives

- ❖ To investigate the relationship between gender, age and socio-economic status and oral health-related quality of life.
- ❖ To investigate the relationship between denture satisfaction and oral health-related quality of life.
- ❖ To investigate the relationship between oral health-related quality of life and complete dentures.



CHAPTER 3

METHODOLOGY

3.1 Study design

During the period 2003 to 2005, any patient requiring a new set of conventional complete dentures who had been on the waiting list of the Prosthetic clinic for treatment by undergraduate students was approached to participate in the study. A total of 76 patients agreed to participate. These patients were identified as needing new complete dentures by the department's staff. Undergraduate students under the careful supervision of staff in the Department of Restorative Dentistry treated participants in the study. The patients were interviewed pre-treatment i.e. at the first visit and 2-3 months post-treatment. The first interview was conducted in the clinical area by a single interviewer. A single interviewer conducted all the interviews to minimise the variability. The interview lasted approximately fifteen minutes. The same interviewer conducted the second interview telephonically.

3.2 Inclusion and exclusion criteria

All edentulous patients requiring prosthetic treatment are screened by departmental staff. During the screening session, a preliminary diagnosis and treatment plan is made. Patients are consequently placed on either undergraduate or postgraduate waiting lists. Patients requesting implant –

supported prosthesis were referred to postgraduate clinics and were excluded.

Any patient without a contact number was also excluded as the follow-up interview was conducted telephonically.

3.3 Ethical and legal considerations

All patients completed a written, informed consent form (see Appendix I). Patients were assured that all information was strictly confidential. The socio-demographic details of the patients were kept separate from the OHIP-EDENT form. The subjects were allocated numbers. All of the data was kept secure in a locked filing cabinet. Only the interviewer had access to these documents. To control for bias, subjects recruited for the study were assured that the research worker was not involved in their treatment and that their participation in the study would not influence the outcome of their treatment or the cost of the treatment.

3.4 Data collection

The OHRQOL was measured using the OHIP-EDENT (Allen and Locker, 2002) (see Appendix III). In addition, some socio-demographic information was also collected namely, age, gender, employment status and ethnicity (see Appendix II). Patients were also asked to answer questions regarding denture satisfaction (post-treatment) following the placement of the new complete dentures.

All the answers to the questions were coded and entered into a spreadsheet by a single operator.

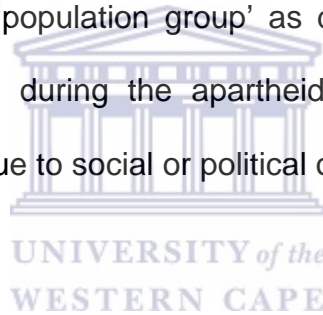
3.4.1 Design of questionnaire

See Appendix II for an example of the questionnaire used.

Demographic details

Contact details and data on gender and age at the time of the interview were collected.

The ethnic background of the patient was also recorded. The categorisation based on 'population group' as defined in the Population Registration Act of 1950 during the apartheid era is used to identify disparities in oral health due to social or political origin.



Socio-economic Factors

Education

Subjects were grouped according to the level of education reached: Primary (up to standard five), Secondary (up to standard nine), Matric and Tertiary education.

Employment

Four categories were created: Employed, Self-Employed, Unemployed and Pensioners.

Income per month

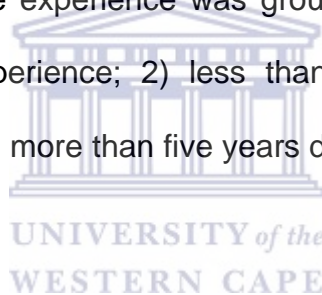
Patients were categorised into four groups. The Provincial Administration of the Western Cape uses these categories: R0- R1666; R1667-R 2166; R2167- R3166; R3167 and more.

Medical history

Patients were asked whether they suffer from the following medical conditions: Diabetes, Hypertension or Osteoporosis.

Previous denture experience

Patients' previous denture experience was grouped into 3 categories: 1) No previous denture experience; 2) less than or equal to five years denture experience and 3) more than five years denture experience.



History of edentulousness

Patients were asked how long they have been edentulous. This was recorded in months.

Denture satisfaction

These questions were only asked at the post-treatment interview and pertained to the new complete dentures the patients had received. Patients were asked, "Are you satisfied with your maxillary/mandibular denture?" Patients responded according to a Likert scale response: 1)

totally satisfied; 2) very satisfied; 3) reasonably satisfied; 4) not very satisfied and 5) not at all satisfied.

3.4.2 Oral Health Impact Profile for the Edentulous Patient (OHIP-EDENT)

Over the past decade a number of oral specific health status measures have been developed. Some of these contain a large number of statements, which make them difficult to use in the clinical setting. The OHIP is a 49-item measure, which was shortened to the 14- item OHIP. In a study conducted by Allen and Locker (2002), high prevalence of “0” (i.e. no impact) scores for a large number of the OHIP-14 statements were found. Many of these subjects wore removable dentures. A concern was that the shortened version did not contain an item related to perceived chewing difficulty, a frequently reported problem for patients wearing removable dentures.

Accordingly, a new subset of 19-OHIP statements specifically for edentulous patients was developed - the Oral Health Impact Profile for Edentulous subjects (OHIP-EDENT) (Allen and Locker, 2002). The item impact method is used to select items that are most relevant to edentulous patients. The five categories of response per item are 1) never, 2) hardly ever, 3) occasionally, 4) fairly often and 5) very often. They are scored from 0 for never to 4 for very often, with lower scores representing a better OHRQOL. This instrument has been tested for reliability and validity.

3.4.3 Definition of terms

Death

Death rates and life expectancy are useful indicators of health and societal well-being. It is an important outcome of many diseases and may be used to measure the success of alternative treatment modalities. While oral cancer is a significant cause of death, death rates may not be a useful indicator of the impact of dental disorders or oral disease.

Impairment

Impairment is defined as any anatomical loss, structural abnormality or disturbance in physical or psychological processes, either present at birth or arising out of disease or injury (Locker, 1989). These measures are common in dentistry: edentulism, number of remaining functional units and the M component of the Decayed Missing Filled Teeth (DMFT) index are measures of tissue loss. The malocclusion classification schemes describe the type and extent of the structural abnormalities of the teeth and jaws.

Functional Limitation

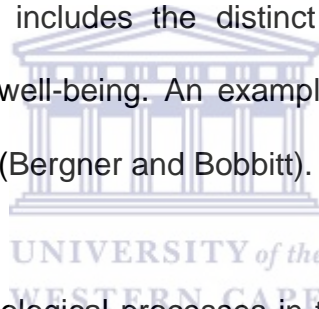
It is described as restrictions in the functions customarily expected of the body. Examples in dentistry include assessments of limitations of jaw mobility, including restricted opening and movements are used in classifying the severity of temporomandibular dysfunction and indices measuring chewing efficiency.

Discomfort

Discomfort is described as self-reported physical and psychological distress, including pain and other feeling states not directly observable. This conforms to the view that disease and illness are two distinct realities and an individual may feel ill without being diseased (Locker, 1989).

Disability

Disability is a behavioral concept and defined as any limitation in or lack of ability to perform daily activities (Locker, 1989). Early measures of disability concentrated on mobility, body movement and body care whereas current thinking includes the distinct dimensions of physical, psychological and social well-being. An example is the Sickness Impact Profile developed in 1981 (Bergner and Bobbitt).



Disease may affect psychological processes in two ways: Firstly, feelings of anxiety, depression, uncertainty, emotional fatigue and hopelessness may be consequences of disease and secondly, cognitive functioning may be affected resulting in forgetfulness, confusion and problems in thoughts and concentration. In the context of dentistry, acute and chronic pain is likely to have these effects.

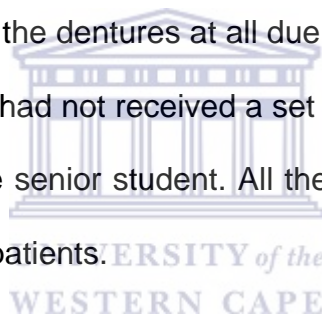
Measures in social well-being including social integration, social contacts, and social and emotional intimacy may also be affected by acute or chronic dental disorders.

Handicap

Handicap is defined as the disadvantage experienced by impaired and disabled people because they do not conform to the expectations of society to which they belong. The disadvantage experienced by chronic sick patients or disabled patients may involve loss of opportunity, actual material, social deprivation and dissatisfaction.

3.5 Missing data

76 Patients participated in the study at the pre-treatment phase. Contact was lost with eight patients at the time of the second interview, two of the patients were not wearing the dentures at all due to problems, two patients relocated and one patient had not received a set of complete dentures and was reassigned to a more senior student. All the analyses were therefore based on a sample of 63 patients.



3.6 Data manipulation

Some of the data was collapsed into fewer groups to allow for an even spread of frequencies and to allow for statistical analyses. The data manipulation carried out will be explained below:

Age: The data was divided into 2 groups viz. less than and equal to the age of 60 and 61 years and older.

Education: The data was collapsed into 2 groups: Primary education (up to standard five) and Secondary education included those subjects who had education at a Secondary level, Matric and a Tertiary education.

Employment: The data was collapsed into 3 groups: Employed and self-employed, Unemployed and Pensioners.

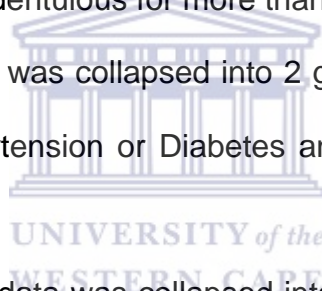
Income per month: The data was collapsed into 3 groups: Subjects with no income, subjects earning less than or equal to R1666 and those earning R1667 or more.

History of Edentulousness: The data was grouped into 3 groups: Subjects who have been edentulous for less than or equal to 15 years, between 16 and 30 years and those edentulous for more than 31 years.

Medical History: The data was collapsed into 2 groups: Subjects suffering from Osteoporosis, Hypertension or Diabetes and those with no medical conditions.

Denture satisfaction: The data was collapsed into 2 groups “satisfied” and “not satisfied”. The satisfied group included categories of totally satisfied, very satisfied and reasonably satisfied. The not satisfied group included not very satisfied and not at all satisfied.

Operator: Dental students in the third and fourth year of study were classified as junior students and students in the fifth and sixth year of study were referred to as senior students.



3.7 Data analyses

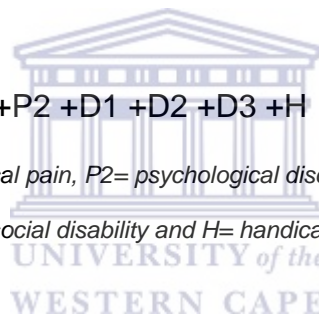
The answers to the demographic questionnaire were coded and entered into an MS-Excel spreadsheet. The answers to the OHIP-EDENT were entered as per question. The score for each domain was then calculated by multiplying each score by its weighting and adding the scores together to form the domain score (Allen and Locker, 2002). The summary score was obtained by adding all domain scores together (see example below).

Example:

Functional limitation=(1.253 x question 1 score) + (1.181x question 2 score)

Summary score= FL +P1 +P2 +D1 +D2 +D3 +H

F= functional limitation, P1= physical pain, P2= psychological discomfort, D1= physical disability, D2= psychological disability, D3= social disability and H= handicap.



The data was then analysed in the following steps:

- Sample size calculation after the application of the exclusion criteria and analysis of cases with missing post-treatment data.
- The frequency distributions of all demographic variables, socio-economic variables, dental history, medical history, denture satisfaction, OHIP-EDENT (baseline) and OHIP-EDENT (post-treatment) were computed.
- Relationships between demographic variables and OHIP-EDENT (post-treatment) scores were explored by comparing mean scores and applying Anova tests.

- Relationships between socio-economic variables and OHIP-EDENT (post-treatment) scores were explored by comparing mean scores and applying Anova tests.
- Relationships between previous denture experience, history of edentulousness, denture satisfaction, medical history and OHIP-EDENT (post-treatment) scores was explored by comparing mean scores and applying Anova tests.
- The OHIP-EDENT (post-treatment) scores were used to assess the impact of all these variables.
- The OHIP-EDENT SCORES of categories very often, fairly often and occasionally were combined into one group and was used to assess the impact of all the variables. This is reflected in the tables depicting baseline and post-treatment scores of the OHIP-EDENT.
- The next step in the analysis was to determine the impact of a new complete denture on the patients' OHRQOL. Paired T-tests were carried out to assess the difference in domain mean scores.
- To investigate the relationship between denture satisfaction and demographic variables and socio-economic variables cross-tabulations were carried out.
- To investigate the relationship between denture satisfaction and level of experience of the operator, cross-tabulations were carried out.

Results are presented as frequency distributions and mean scores. For the Anova tests, Chi-square tests and Paired T-tests; a p-value <0.05 was considered as statistically significant.

The data analyses and re-codings were carried out using the Statistical Package for Social Sciences (SPSS) version 11.



CHAPTER 4

RESULTS

4.1 Frequency distributions of data collected

4.1.1 Demography of the sample

A total of 76 patients agreed to participate in the study. At the post-treatment interview (2-3 months later), 8 patients could not be contacted, 2 patients were not wearing the dentures at all, 2 patients relocated and 1 patient had not received her dentures as she was reassigned to a more senior student. A final sample of 63 patients was then included in the study. Eighty-one percent (n=51) of the sample was female (see Table 3). The age ranged from 34 years to 80 years old with a mean age of 58 years. Fifty-two percent of the sample was ≤ 60 years of age.

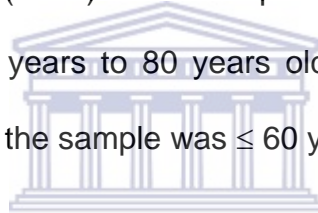


Table 3: Frequency distribution of Demographic data

Demography		Frequency (n)	%
Gender	Male	12	19
	Female	51	81
Age group	≤ 60 years	33	52
	> 60 years	30	48
Ethnic group	White	16	25
	Coloured	44	70
	Asian	3	5

Seventy percent of the sample had a Coloured ethnic background. A quarter of the sample had a White ethnic background and the rest of the sample was Asian.

4.1.2 Education level

Fifty-one percent (n=32) of the sample had secondary (beyond standard 9) education or tertiary education, while 49% (n=31) had no formal schooling or schooling up to standard 5.

4.1.3 Income per month

Fifty-six percent (n=35) reported an income below R1666; 14% (n=9) had an income exceeding R1667 and 30% (n=19) had no source of income.

4.1.4 Employment status

Forty-one percent (n= 26) of the sample were pensioners, 31% (n=19) were employed and 28% (n=18) were unemployed.

4.1.5 Dental history

Forty-four percent (n=28) had been edentulous for between 16 and 30 years (see Table 4). The mean time span for edentulousness was 25 years. The minimum time a patient was edentulous was 2 months and the maximum period was 59 years.

Table 4: Frequency distribution of history of edentulousness

How long have you been edentulous?	Frequency (n)	%
≤15 years	14	22
16-30 years	28	44
> 31 years	17	27
Missing	4	7

4.1.6 Medical history

Seventy-seven percent of the patients (n=63) participating in the study reported a medical condition (see Table 5). The most prevalent condition was hypertension.

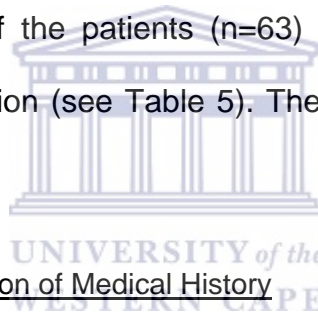


Table 5: Frequency distribution of Medical History

Medical History	Frequency (n)	%
Diabetes	15	24
Hypertension	32	51
Osteoporosis	2	3

4.1.7 Level of clinical experience of dental students

Almost $\frac{2}{3}$ of the sample (63%) of the patients was treated by junior dental students (third and fourth years).

4.1.8 OHIP-EDENT (baseline)

The frequency distributions of the scores of the OHIP-EDENT are presented in Table 6. (For more detail, refer to Appendix IV).

Functional limitation was the most prevalent OHRQOL impairment with 40% of the patients indicating that they had difficulty chewing foods very often; 14% fairly often and 14% occasionally. *Psychological discomfort* was reported by more than half of the patients. Forty-eight percent indicated being worried by dental problems very often, fairly often and occasionally. Fifty-six percent of the patients indicated that they were self-conscious of their teeth, mouth or dentures very often, fairly often or occasionally. *Physical pain* was less prevalent. Fifty-nine percent of patients reported experiencing painful aching in the mouth hardly ever or never. *Physical disability* was also prevalent with 65% patient indicating that they avoided eating some foods because of problems with their dentures or mouth. Only the responses concerning *psychological disabilities* and *handicap* were significantly lower, with only 40% and 49% of the patients indicating they had these OHRQOL impairments very often, fairly often or occasionally.

Table 6: Summary of frequency distributions at baseline

Domains	OHIP-EDENT Questions (Baseline)	Frequency % Combined *2,3,4
F	1. Have you had difficulty chewing any foods because of problems with your teeth, mouth or dentures?	68
F	2. Have you had food catching in your teeth or dentures?	51
P1	3. Have you had painful aching in your mouth?	42
P1	4. Have you found it uncomfortable to eat any foods because of problems with your teeth, mouth or dentures?	62
P1	5. Have you had sore spots in your mouth?	35
F	6. Have you felt that your dentures have not been fitting properly?	44
P1	7. Have you had uncomfortable dentures?	38
P2	8. Have you been worried by dental problems?	48
P2	9. Have you been self-conscious because of your teeth, mouth or dentures?	56
D1	10. Have you had to avoid eating some foods because of problems with your teeth, mouth or dentures?	65
D1	11. Have you been unable to eat with your dentures because of problems with them?	33
D1	12. Have you had to interrupt meals because of problems with your teeth, mouth or dentures?	48
D2	13. Have you been upset because of problems with your teeth, mouth or dentures?	48
D2	14. Have you been a bit embarrassed because of problems with your teeth, mouth or dentures?	40
D3	15. Have you avoided going out because of problems with your teeth, mouth or dentures?	31
D3	16. Have you been less tolerant of your partner or family because of problems with your teeth, mouth or dentures?	21
D3	17. Have you been irritable with other people because of problems with your teeth, mouth or dentures?	24
H	18. Have you been unable to enjoy other peoples company as much because of problems with your teeth, mouth or dentures?	27
H	19. Have you felt that life in general was less satisfying because of problems with your teeth, mouth or dentures?	30

F= functional limitation, P1= physical pain, P2= psychological discomfort, D1= physical disability,

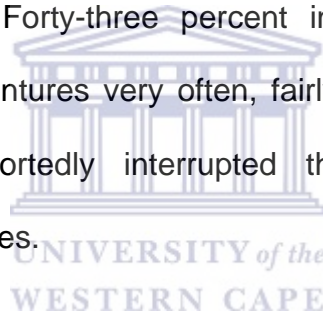
D2= psychological disability, D3= social disability and H= handicap.

**2, 3, 4= occasionally, fairly often and very often*

4.1.9 OHIP-EDENT (post-treatment)

The frequency distributions of the scores of the OHIP-EDENT are presented in Table 7. (For more detail, refer to Appendix V).

Physical pain was the most prevalent OHRQOL impairment with 51% of the patients indicating that they found it uncomfortable chewing any foods very often, fairly often and occasionally. Thirty-nine percent of the patients reported that they had painful aching on the mouth very often, fairly often and occasionally. Sixty-three percent reported having difficulty chewing foods and 50% reported food catching in the dentures very often, fairly often and occasionally. Forty-three percent indicated that they were unable to eat with the dentures very often, fairly often and occasionally. Thirty-eight percent reportedly interrupted their meals because of problems with their dentures.



Responses for *psychological disability*, *social disability* and *handicap* were significantly lower. Eighty-one percent of the patients indicated that they were hardly ever or never embarrassed because of problems with their dentures. Fourteen percent indicated that they avoided going out very often, fairly often or occasionally.

Table 7: Frequency distributions of post-treatment scores

Domains	OHIP-EDENT Questions (Post-treatment)	Frequency % Combined *2,3,4
F	1. Have you had difficulty chewing any foods because of problems with your teeth, mouth or dentures?	63
F	2. Have you had food catching in your teeth or dentures?	50
P1	3. Have you had painful aching in your mouth?	39
P1	4. Have you found it uncomfortable to eat any foods because of problems with your teeth, mouth or dentures?	51
P1	5. Have you had sore spots in your mouth?	41
F	6. Have you felt that your dentures have not been fitting properly?	41
P1	7. Have you had uncomfortable dentures?	45
P2	8. Have you been worried by dental problems?	29
P2	9. Have you been self-conscious because of your teeth, mouth or dentures?	27
D1	10. Have you had to avoid eating some foods because of problems with your teeth, mouth or dentures?	48
D1	11. Have you been unable to eat with your dentures because of problems with them?	43
D1	12. Have you had to interrupt meals because of problems with your teeth, mouth or dentures?	38
D2	13. Have you been upset because of problems with your teeth, mouth or dentures?	34
D2	14. Have you been a bit embarrassed because of problems with your teeth, mouth or dentures?	19
D3	15. Have you avoided going out because of problems with your teeth, mouth or dentures?	14
D3	16. Have you been less tolerant of your partner or family because of problems with your teeth, mouth or dentures?	11
D3	17. Have you been irritable with other people because of problems with your teeth, mouth or dentures?	11
H	18. Have you been unable to enjoy other peoples company as much because of problems with your teeth, mouth or dentures?	7
H	19. Have you felt that life in general was less satisfying because of problems with your teeth, mouth or dentures?	13

F= functional limitation, P1= physical Pain, P2= psychological discomfort, D1= physical disability,

D2= psychological disability, D3= social disability and H= handicap.

**2, 3, 4= occasionally, fairly often and very often*

4.1.10 Denture satisfaction (post-treatment)

Generally all the patients were satisfied with their maxillary dentures and more than a third of the patients were dissatisfied with their mandibular dentures (see Table 8).

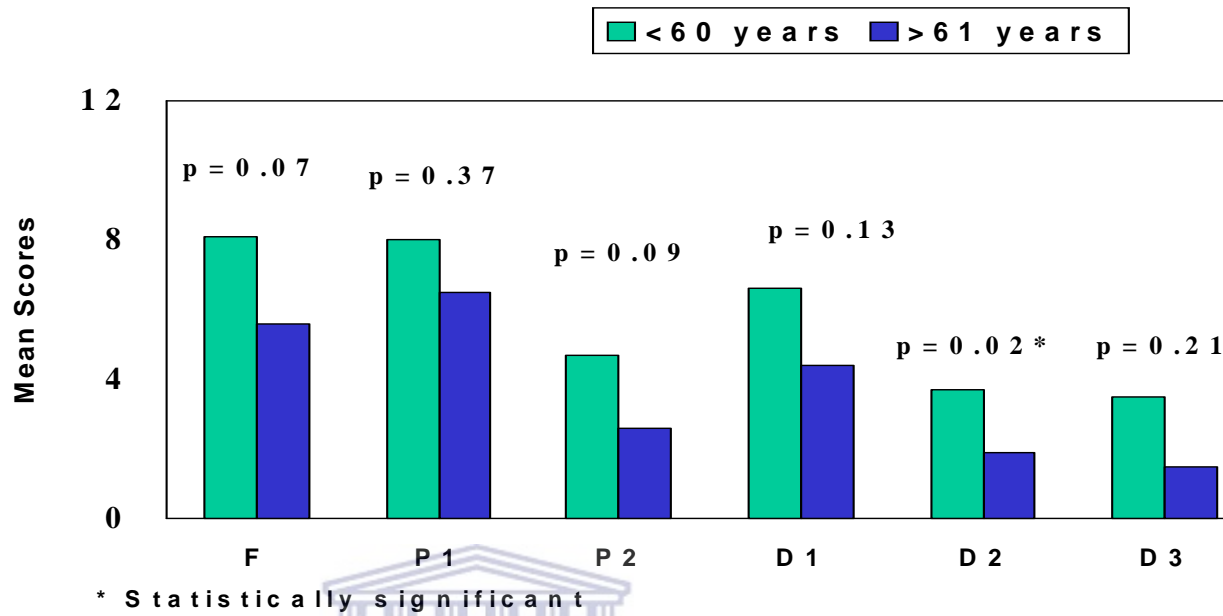
Table 8: Frequency distribution of denture satisfaction

	Denture satisfaction	Frequency (n)	%
Maxillary denture	Satisfied	57	90
	Not Satisfied	6	10
Mandibular denture	Satisfied	40	64
	Not Satisfied	23	36

4.2 Relationships between demographic variables, socio-economic variables, dental history and OHIP-EDENT (post-treatment)

4.2.1 Age and OHRQOL (post-treatment)

Patients under the age of 60 years generally reported higher impacts in all domains compared to patients over the age of 60. The highest scores were recorded in *functional limitations* (Mean=7.95) and *psychological discomfort* (Mean=8). In patients over the age of 60, the highest impacts were recorded in the domains *functional limitations* and *psychological discomfort* (see Figure 2).



F= functional limitation, P1= physical pain, P2= psychological discomfort, D1= physical disability, D2= psychological disability, D3= social disability and H= handicap.

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Figure 2: Relationship between Age and OHRQOL (post-treatment)

4.2.2 Gender and OHRQOL (post-treatment)

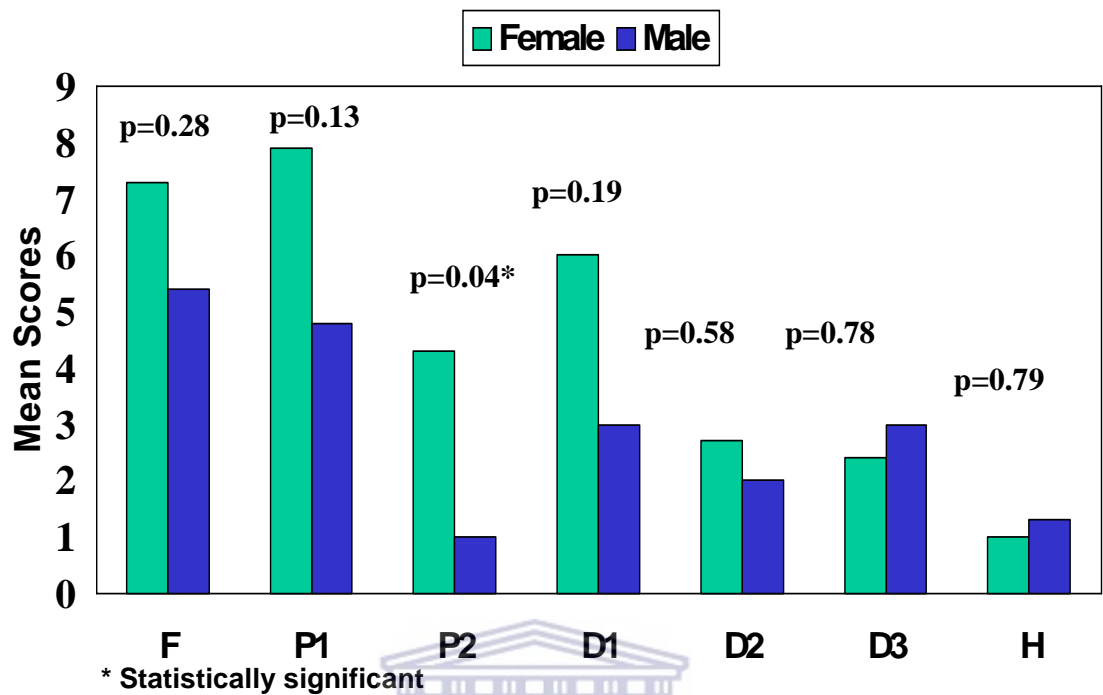
Females recorded higher impacts in all domains except *social disability* and *handicap* (see Figure 3). A significant relationship was found between gender and *psychological discomfort* ($p=0.039$) with the females scoring almost four times higher than males.

4.2.3 Education and OHRQOL (post-treatment)

Patients who had no formal schooling or schooling up to standard 5 reported much lower impacts than patients who had secondary or tertiary education. A significant relationship was found between education and *functional limitation* ($p=0.026$) and *physical disability* ($p=0.036$)(see Figure 4). The overall summary score was also significantly different ($p=0.042$).

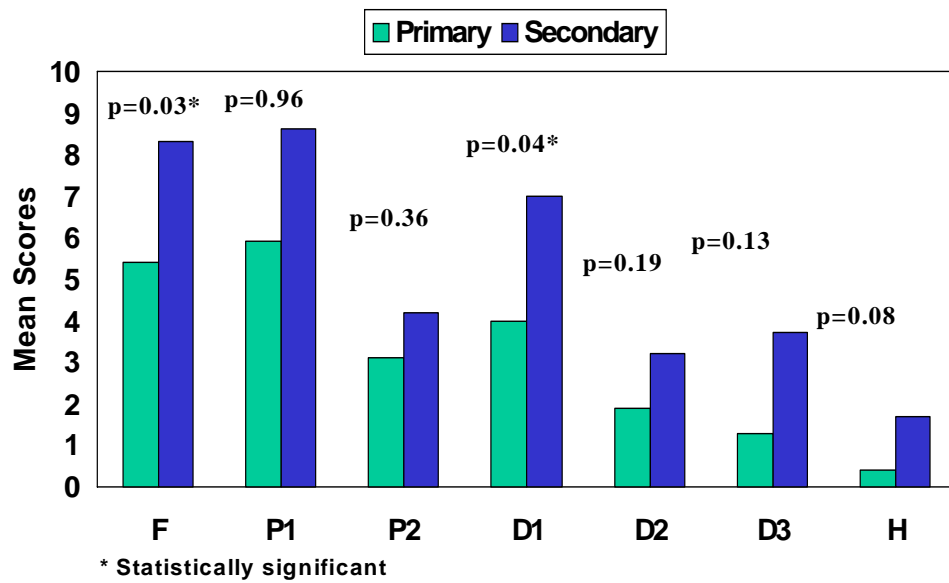
4.2.4 Employment status and OHRQOL (post-treatment)

Pensioners consistently reported lower OHRQOL impacts in all the domains except *social disability* and *handicap*. The employed patients had the highest scores for the Psychosocial domains and *physical disability* (see Figure 5). The unemployed patients reported the highest impacts with regard to *functional limitation* (Mean=8.4) and *physical pain* (Mean=9.04). A significant relationship was found between *social disability* and employment.



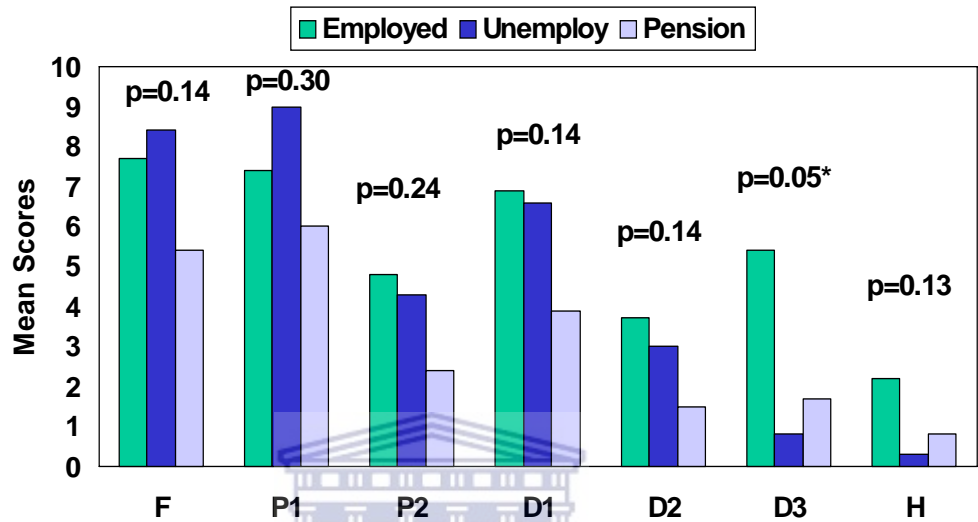
F= functional limitation, P1= physical pain, P2= psychological discomfort, D1= physical disability, D2= psychological disability, D3= social disability and H= handicap.

Figure 3: Relationship between Gender and OHRQOL (post-treatment)



F= functional limitation, P1= physical pain, P2= psychological discomfort, D1= physical disability, D2= psychological disability, D3= social disability and H= handicap

Figure 4: Relationship between Education and OHRQOL (post-treatment)



* Statistically significant

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F= functional limitation, P1= physical pain, P2= psychological discomfort, D1= physical disability, D2= psychological disability, D3= social disability and H= handicap

Figure 5: Relationship between Employment Status and OHRQOL (post-treatment)

4.2.5 Income and OHRQOL (post-treatment)

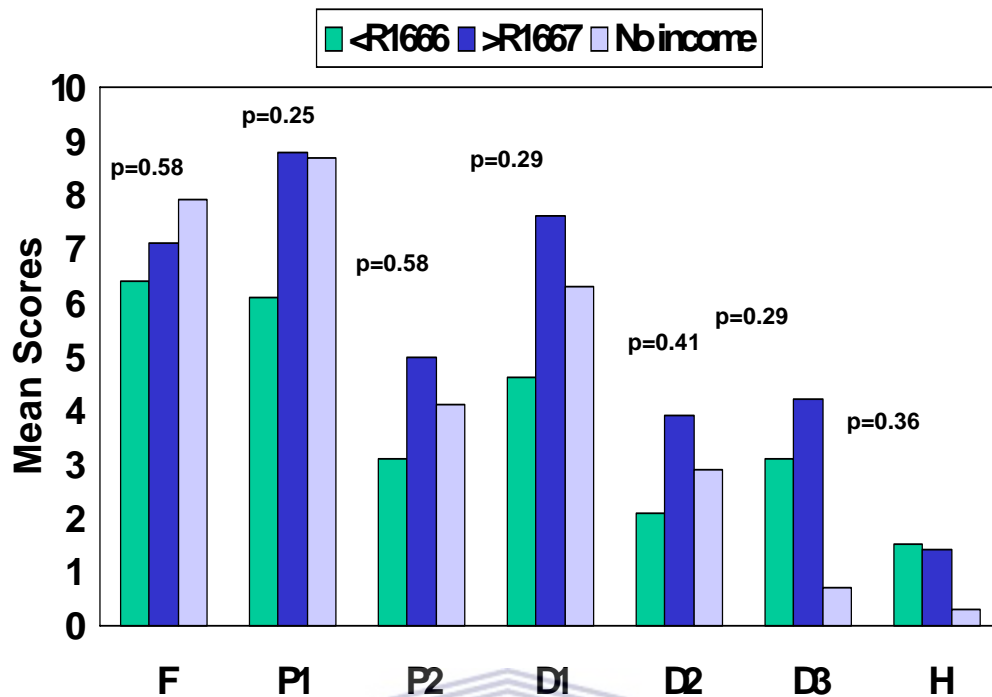
Patients who were in a higher income group generally reported more OHRQOL impacts than patients who earned a lower salary (see Figure 6). Patients who had no source of income recorded the lowest impacts for *social disability* (Mean=0.72) and *handicap* (Mean=0.25). Although differences could be noted no statistically significant relationships were found.

4.2.6 Medical history and OHRQOL (post-treatment)

Patients who had no medical condition reported higher impact scores in all domains (see Figure 7). Significant relationships were found between the psychosocial domains and general health.

4.2.7 History of edentulousness and OHRQOL (post-treatment)

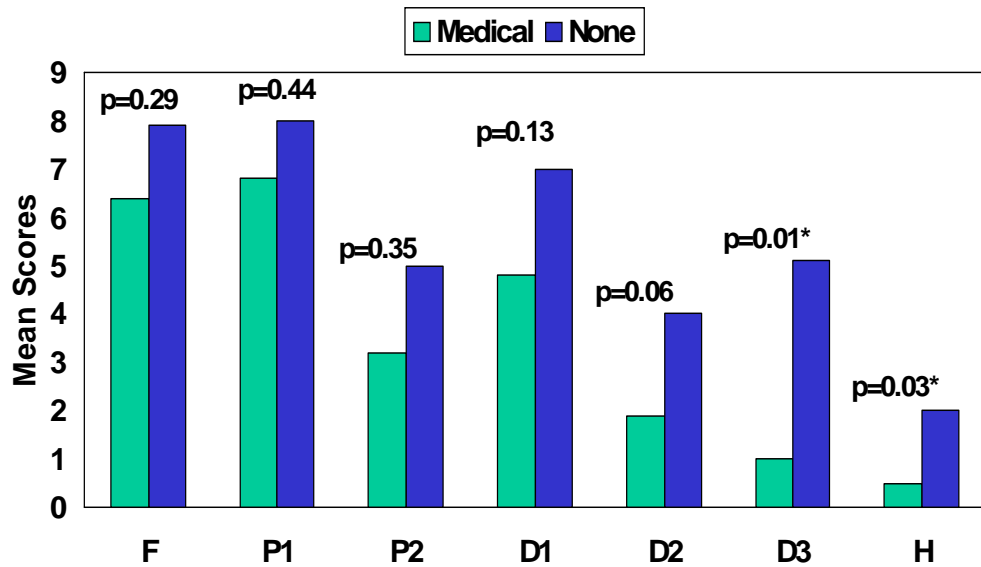
Patients who were edentulous for more than 30 years scored fewer impacts in all domains except *physical pain*, *social disability* and *handicap* (see Figure 8). Patients who were edentulous for less than 15 years recorded the highest impact in *functional limitation* (Mean=7.7), *psychological disability* (Mean=3.13) and *handicap* (Mean=1.78). No statistically significant differences were found between the groups.



* Statistically significant

F= functional limitation, P1= physical pain, P2= psychological discomfort, D1= physical disability, D2= psychological disability, D3= social disability and H= handicap

Figure 6: Relationship between Income and OHRQOL (post-treatment)



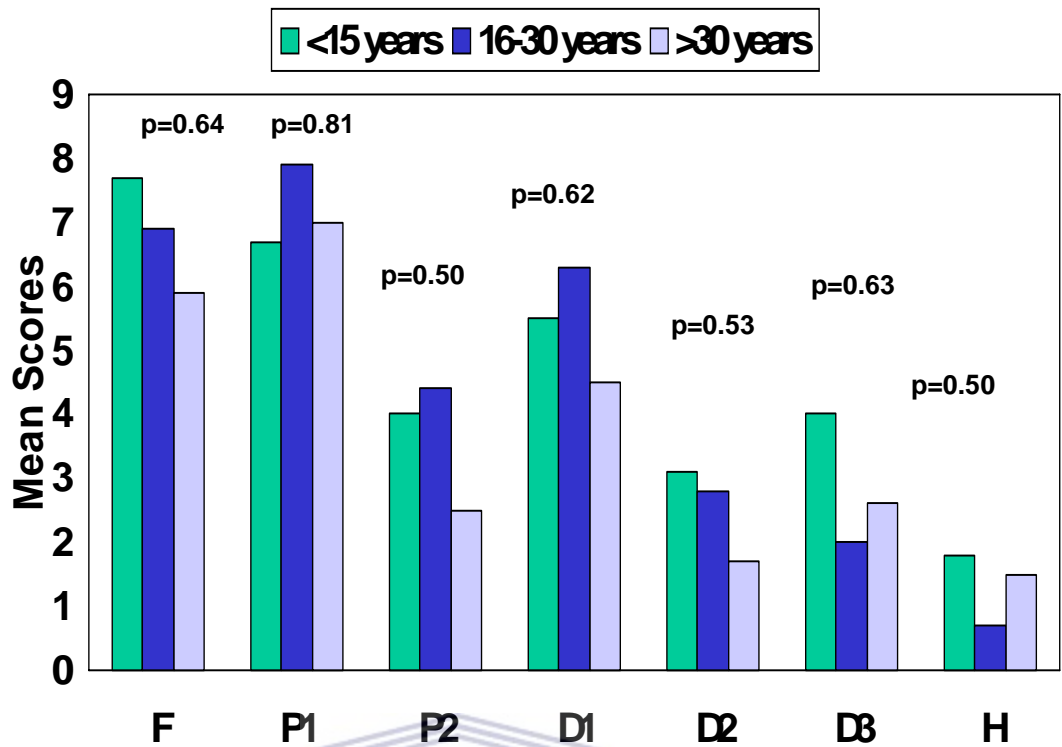
* Statistically significant



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F= functional limitation, P1= physical pain, P2= psychological discomfort, D1= physical disability, D2= psychological disability, D3= social disability and H= handicap

Figure 7: Relationship between Medical History and OHRQOL (post-treatment)



* Statistically significant

F= functional limitation, P1= physical pain, P2= psychological discomfort, D1= physical disability, D2= psychological disability, D3= social disability and H= handicap

Figure 8: Relationship between History of Edentulousness and OHRQOL (post-treatment)

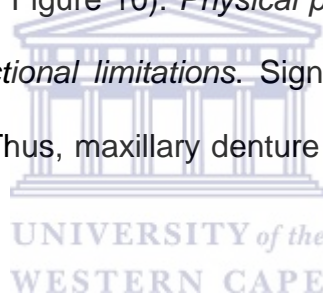
4.2.8 Previous denture experience and OHRQOL (post-treatment)

Patients who had no previous denture experience generally scored higher than those patients who had more than five years previous denture experience (see Figure 9). Significant relationships were found between *social disability* ($p=0.01$) and *handicap* ($p=0.01$) and previous denture experience.

4.2.9 Denture satisfaction and OHRQOL (post-treatment)

Maxillary denture

Patients who were not satisfied with their new dentures scored significantly higher in all domains (see Figure 10). *Physical pain* was the domain most affected followed by *functional limitations*. Significant relationships were recorded in all domains. Thus, maxillary denture satisfaction is a predictor of OHRQOL.



Mandibular denture

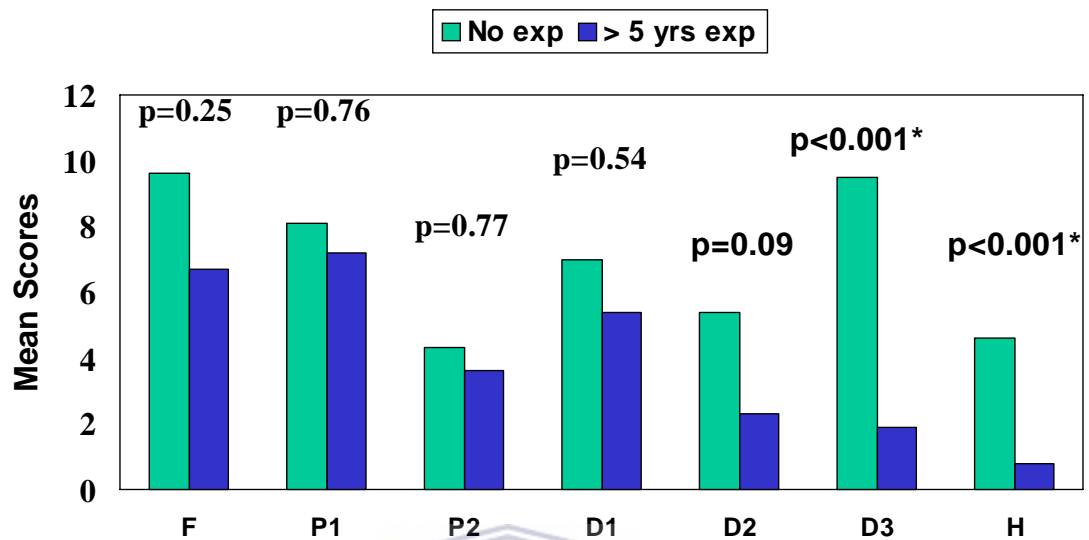
Patients who were satisfied with their mandibular dentures reported fewer impacts on their OHRQOL (see Figure 11). Significant relationships were recorded in all domains.

4.2.10 Level of clinical experience and OHRQOL (post-treatment)

Patients treated by senior students had generally lower impacts recorded in all domains (see Figure 12). No significant relationship was found between the level of clinical experience and OHRQOL.

The same analyses were conducted with the OHRQOL (baseline) scores. In these results, patients treated by senior students had high initial impacts in *functional limitation* and *physical pain* domains. No significant relationships were found.



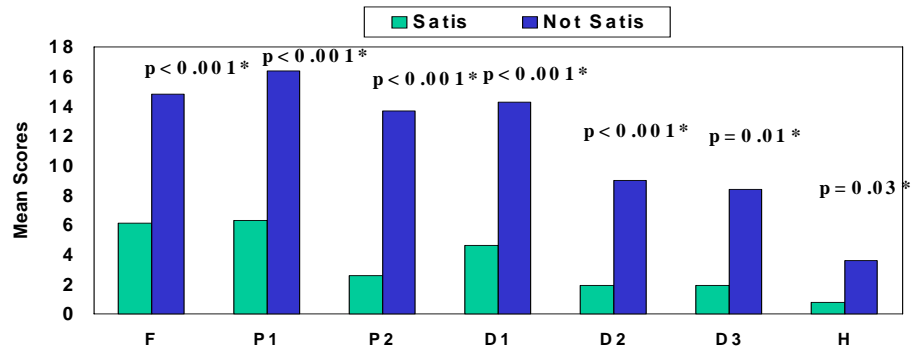


* Statistically significant



F= functional limitation, P1= physical pain, P2= psychological discomfort, D1= physical disability, D2= psychological disability, D3= social disability and H= handicap

Figure 9: Relationship between Previous denture experience and OHRQOL (Post-treatment)

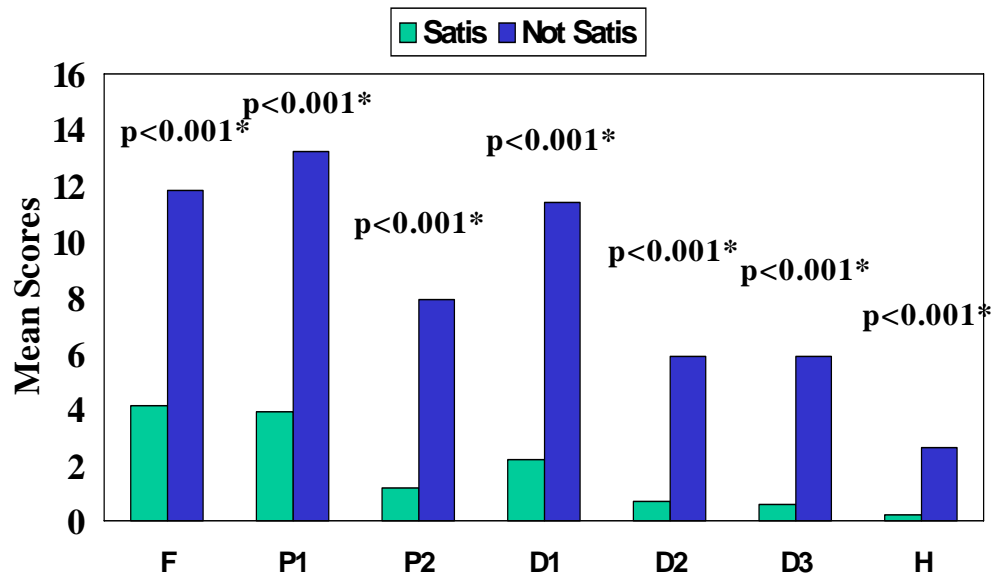


* Statistically significant

F= functional limitation, P1= physical pain, P2= psychological discomfort, D1= physical disability, D2= psychological disability, D3= social disability and H= handicap

Figure 10: Relationship between Maxillary denture satisfaction and OHRQOL(post-treatment)

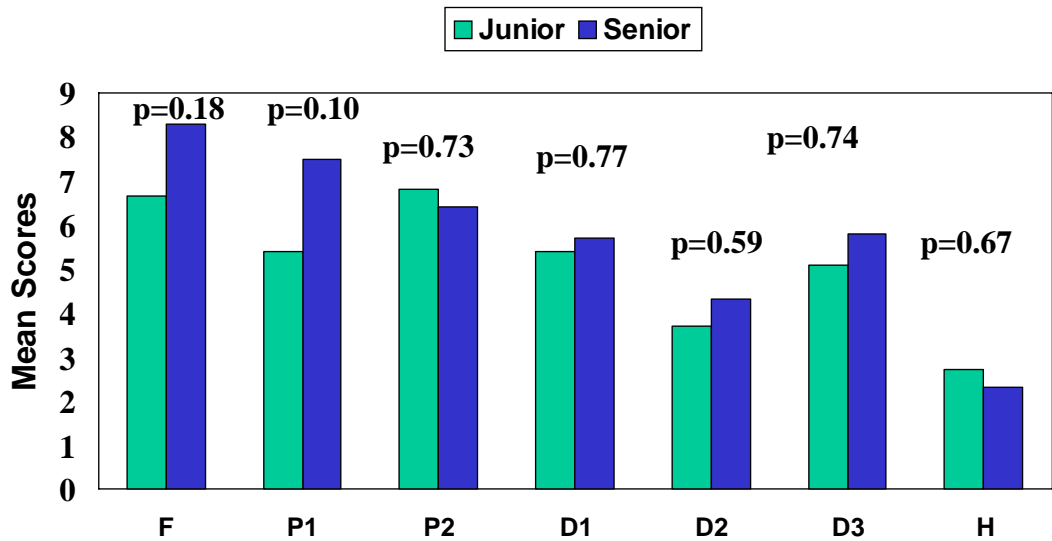




* Statistically significant

F= functional limitation, P1= physical pain, P2= psychological discomfort, D1= physical disability, D2= psychological disability, D3= social disability and H= handicap

Figure 11: Relationship between Mandibular denture satisfaction and OHRQOL (post-treatment)



* Statistically significant

F= functional limitation, P1= physical pain, P2= psychological discomfort, D1= physical disability, D2= psychological disability, D3= social disability and H= handicap

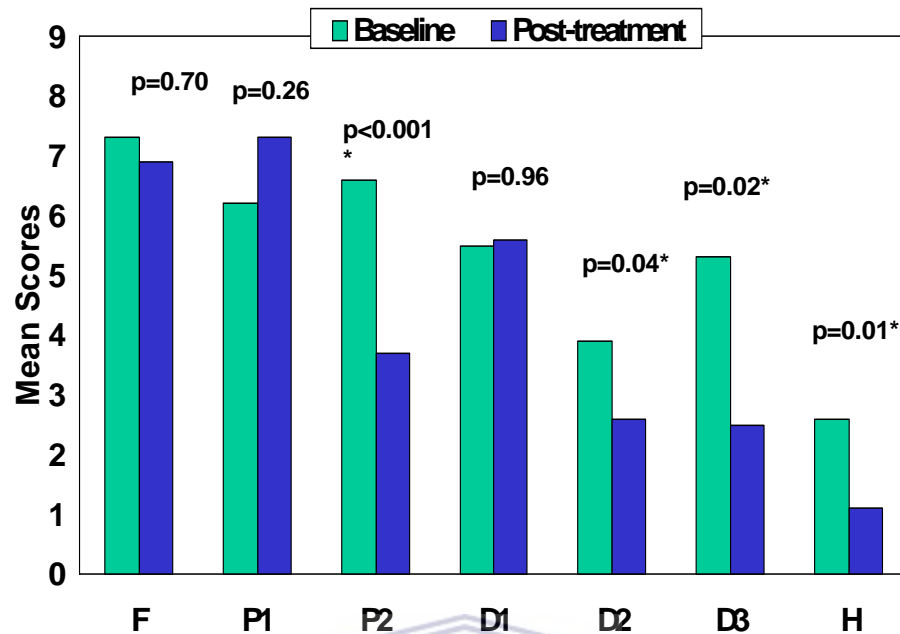
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Figure 12: Relationship between Level of clinical experience and OHRQOL (post-treatment)

4.2.11 OHIP-EDENT (baseline) and OHIP-EDENT (post-treatment)

Patients reported less OHRQOL impacts following the receipt of their new dentures in all domains except *physical pain* and *physical disability* (Refer to Appendix VI and Figure 13). Post-treatment, the highest score was recorded for *physical pain* with a mean paired difference of – 1.1. Significant relationships were recorded in all the psychosocial domains. The greatest mean paired difference was reported in the *psychological discomfort* domain (2.9) and the *social disability* domain (2.8). *Functional limitation* reported the least improvement following treatment with a mean paired difference of 0.34. The summary score reflected an improvement of 7 units with regards to OHRQOL.





*Statistically significant

F= functional limitation, P1= physical pain, P2= psychological discomfort, D1= physical disability, D2= psychological disability, D3= social disability and H= handicap

Figure 13: Relationship between OHIP-EDENT (post-treatment) and OHIP-EDENT (baseline)

4.3 Relationship between denture satisfaction and demographic variables, socio-economic variables and previous denture experience

4.3.1 Relationship between denture satisfaction and demographic variables

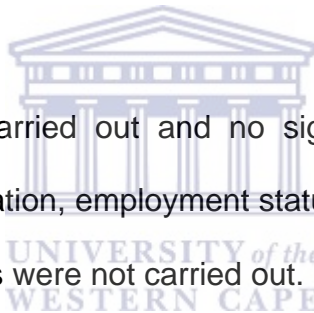
Cross-tabulations were carried out and no significant relationship was found with regard to age and gender. Further statistical analyses were not carried out.

4.3.2 Relationship between denture satisfaction and socioeconomic variables

Cross-tabulations were carried out and no significant relationship was found with regard to education, employment status and income per month. Further statistical analyses were not carried out.

4.3.3 Relationship between denture satisfaction and previous denture experience

Cross-tabulations were carried out and no significant relationship was found.

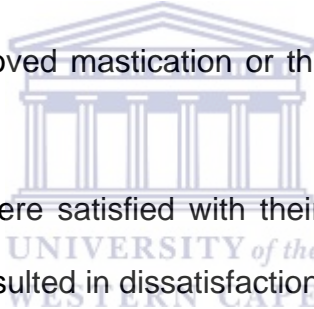


CHAPTER 5

DISCUSSION

This is the first study providing data about impaired OHRQOL in patients seeking prosthodontic treatment and receiving complete dentures in South Africa. It was found that these patients have a considerably impaired level of OHRQOL prior to treatment. However, the OHRQOL improved within 2-3 months following complete denture treatment as indicated by reduced mean OHIP-EDENT scores. A statistically significant improvement was observed in the *psychological discomfort, psychological disability, social disability* and *handicap* domains. The new complete dentures did not contribute greatly to improved mastication or the relief of denture-related pain.

Although most patients were satisfied with their new maxillary dentures, the mandibular denture resulted in dissatisfaction.



5.1 Demography of the Sample

5.1.1 Age, gender and ethnicity of the sample

The mean age of the sample was 58 years and about half of the sample was older than 61 years. The majority (70%) of the sample was from a Coloured ethnic background and this could be explained by the location of the dental clinic. There are several Coloured townships in its immediate surroundings. The majority of the patients attending the Prosthetic Clinic at the University were females (81%). The results of this study may be skewed because of the uneven gender distribution. However, the findings

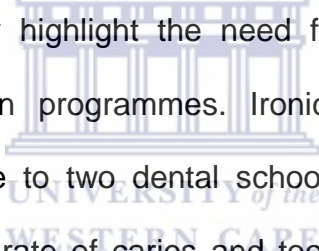
of the present study support the trend in previous local studies (Naude et al, 1994; Naidoo et al, 2001) that females are more likely to be edentulous than males.

The average patient in this sample was edentulous for 25 years (mean history of edentulousness). This implies that the patient became edentulous at a mean age of 34 years. This finding is in accordance with previous studies (Louw and Moola, 1979; Naude et al, 1994; Naidoo et al, 2001) that edentulousness increases with age. This could be because the older patients are more likely to suffer from medical conditions as well and that edentulousness is viewed as a more hassle-free condition. Also, these patients may have been part of a generation who did not place much confidence in restorative dentistry or understand the advantages of periodontal treatment. As a result, older patients experienced higher rates of tooth loss.

The present study also supports the findings of Naude et al (1994), that from the age of 20, the Coloured population loses their natural teeth at a much faster rate than other population groups in the same age groups. The high prevalence of tooth loss may be attributed to a high decay rate and high prevalence of periodontal disease. Watermeyer et al (1981) found that the Whites and Coloureds had their teeth removed at an early age, believing that it would eliminate any future oral health care. Many patients also found it a more cost-effective, pain-free alternative.

Hartshorne and Carstens (1991) found that 49% of indigents requesting dentures in the Western Cape had no motivational reasons for wanting dentures. These results are indicative of the low priority placed on retaining the natural teeth and the results of socio-cultural behaviour patterns that are detrimental to dental health.

Tooth loss is one of the severe compromises of dental function. It is the dental equivalent of mortality. Tooth loss reflects the attitude of patients, service providers, availability and accessibility of care and the prevailing mindset about dental treatment.

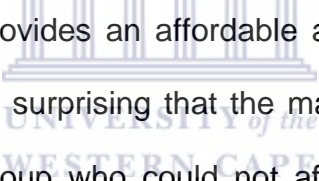


The results of this study highlight the need for more effective health promotion and prevention programmes. Ironically, prior to 2004 the Western Cape was home to two dental schools. Should this not have helped in decreasing the rate of caries and tooth loss? One may argue that the inhabitants of areas surrounding these dental schools have benefited from the provision of oral health care. However, the results of this study should provide motivation for the creation and sustainability of outreach programmes in the rural areas or areas where access to oral health care is a problem.

5.1.2 Socio-economic indicators

Almost all the subjects in this study could be classified as belonging to the low-income group, with 56% with an income below R 1666 and 30% without a source of income. Only less than a third (31%) were employed.

More than half of the sample had a low income and this could be explained by the fact that almost half of the sample was pensioners. Half the sample had no formal schooling. Edentulous patients are more likely to come from lower socio-economic background as reflected in the results concerning the demographic data, especially in the low levels of income and education (Heydecke et al, 2004).



The dental school also provides an affordable alternative for oral health treatment and so, it is not surprising that the majority of the patients are from the lower income group who could not afford private treatment. It would be expected that the majority of people who use the public healthcare services could not afford treatment in the private healthcare setting.

The high rate of unemployment in the sample could also be explained by two reasons: Firstly, the area surrounding the dental clinic generally has a high rate of unemployment. Secondly, the Prosthetic Clinic forms part of the University and is therefore a teaching platform for dental students, undergraduate and postgraduate. Due to timetabling constraints, students

provide the treatment over a longer period of time than normal and this may deter employed people from using this service. More time off from work would be required.

5.2 Medical history and dental history

More than $\frac{3}{4}$ of the patients were suffering from a medical condition and this could be attributed to the age of the sample. Older patients are generally more likely to suffer from a medical condition such as diabetes, hypertension and osteoporosis. Studies have also shown that medical conditions such as diabetes and hypertension could significantly affect the health related quality of life (Heydecke et al, 2004).

Almost all the subjects (92%) in this study had previously worn a set of complete dentures. The DOHS (Naidoo et al, 2001) found 52% of the Western Cape population had lost all their natural teeth and 60% of them were denture wearers. The study did not make a distinction between complete dentures and partial dentures. Hartshorne (1998) found the highest prevalence of subjects without dentures (20%) amongst the Coloured population of the Western Cape. A weakness of the current study was that no information was obtained regarding the age of the denture.

5.3 Denture satisfaction

Generally, all the patients were satisfied with the maxillary denture received during their treatment. A higher rate of dissatisfaction was recorded for the mandibular denture (36%) than the maxillary denture (10%). It is a clinically known fact that the lower denture is more problematic and this has been verified by Carlsson et al (1967). These findings are higher than the 20% dissatisfaction rate found in the NOHS of 1989 (Naude et al, 1994). This difference could be attributed to the level of clinical experience of the operator.

Despite this, a high rate of overall satisfaction is noted. This may be explained by the two reasons: Firstly, most dental patients in a dental school environment develop a degree of friendship towards their student. Therefore, many patients may have been protective of students when answering the questions and found it difficult to express their dissatisfaction (Guckes at al, 1978; Berg, 1988). Secondly, the present study evaluated denture satisfaction within a short time (2-3 months) following clinical procedure completion. This may also contribute to the high rate of satisfaction as almost all the patients in this sample had previous denture experience. Patients who have worn dentures previously are able to relearn or reinforce the neuromuscular control required to stabilise a denture more quickly than a patient who has no previous experience (Weinstein et al, 1988). Also, patients with previous experience may have more realistic aesthetic and psychosocial expectations.

However, the findings of this study supported Van Waas (1990a, 1990b) who found no correlation between previous denture experience and denture satisfaction.

5.3.1 Denture satisfaction and demographic variables

Age and gender was found not to have an influence on denture satisfaction. This finding is in agreement with Baer et al (1992), that gender may only represent a minor to moderate influence on satisfaction with complete dentures. In studies conducted by Mersel et al (1995) and Weinstein et al (1988), age was found not to be a predictor of denture success.

5.3.2 Denture satisfaction and level of clinical experience

In this study, no relationship was found between denture satisfaction and the level of clinical experience. This study also identified an issue concerning evaluation of the quality of the prostheses made by dental students. A weakness of this study was the assumption that because dental students are being taught the same techniques and theory about complete denture construction, the dentures would be clinically acceptable. Studies by Peltola et al (1997) and Davis (1986) showed that new prostheses made by dental students and evaluated on technical characteristics are generally satisfactory with regard to fit and occlusion.

5.3.3 Denture satisfaction and OHRQOL (post-treatment)

Denture satisfaction is a predictor of OHRQOL. Significant relationships were found between maxillary and mandibular denture satisfaction and all domains of OHRQOL. These results were in correlation with Yoshida et al (2001), who agreed that patients who were satisfied with their dentures were also satisfied with their quality of life.

In this study, it was found that patients who were dissatisfied with their maxillary denture scored higher impacts in *functional limitations* (Mean=14.8) and *physical pain* (Mean=16.5). This is in contrast to Berg (1988) who found that one year post-insertion, patients still experienced more pain related to the mandibular denture. With regards to function, Garrett et al (1996) found a high correlation between perceptions of chewing ability, eating enjoyment, food choices and particles under dentures.

5.4 OHIP-EDENT (baseline)

More than two thirds (68%) of the sample experienced great difficulty eating with their previous dentures and only 42% experienced pain in their mouth in the last month. Patients recorded higher impacts related to *functional limitations*. This could be due to ill-fitting dentures, inadequate retention and the resulting discomfort experienced by edentulous patients (Heydecke et al, 2004). This suggests that although they experienced great difficulty with eating, patients persevered because it was not painful.

Most edentulous patients feel helpless and believe that they have to accept denture problems as part of wearing a prosthesis (Awad et al, 2003a).

A substantial proportion of edentulous patients with complete dentures reported an impaired OHRQOL. Almost half of the patients (48%) were worried by dental problems and upset about problems with their dentures. Almost a third (30%) of patients admitted to finding life less satisfying because of problems with their dentures.

The most prevalent impacts were recorded in the *functional limitation* domain followed by *psychological discomfort* and *physical pain* was ranked third. It is difficult to compare the results of this study because of the difference in study design, age and sample size. However, Heydecke et al (2004) found the most prevalent impacts to be *physical pain*, *functional limitation* and *physical disability*.

Ill-fitting dentures may adversely affect the appearance of the patient hence the high scores in the psychosocial domains. It has been suggested that the longer dentures are worn, the better they are tolerated, despite a poor fit (Rise and Heloe, 1978).

Denture age and quality of the patients' existing denture was not taken into account and was a weakness of the study. Both of these factors could

explain the high degree of impairment experienced by the subjects at baseline. However, researchers have stated that the clinical evaluation of the quality of the dentures is unreliable due to the lack of acceptable and reliable criteria (Berg, 1993; Weinstein et al, 1988; Carlsson et al, 1967). Also, there have been conflicting results regarding the influence of denture quality on patient satisfaction (Fenlon and Sherriff, 2004; Wolff et al, 2003; Yoshizumi, 1964; Langer et al, 1961; Carlsson et al, 1967).

5.5 OHIP-EDENT (post-treatment)

More patients reported *physical pain* (Mean=7.3) as impacting on their OHRQOL as compared to baseline results. This is explained by the fact that they had all received new dentures 2-3 months earlier and some patients were still adjusting to them. Heydecke et al (2004) found that one month after treatment almost half of the patients reported pain. Because of the short reference period used acute impacts on OHRQOL were measured. It would have been interesting to note whether the number of adjustment visits needed affected the OHRQOL of patients.

The OHIP-EDENT (post-treatment) results were used to determine whether any relationships existed between demographic factors, denture satisfaction, level of clinical competency and OHRQOL. It was felt that by using the post-treatment results all patients were “standardised” with regards to denture status and a more accurate interpretation of the OHRQOL impacts could be made. A limitation of this study was that no

clinical examination of the denture was conducted to evaluate the quality of the denture nor was the age of the old denture determined. Also, the anatomy of the edentulous mouth was not taken into consideration.

5.5.1 OHIP-EDENT (post-treatment) and demographic factors

Similar to John et al (2004b) and Heydecke et al (2004), this study found that younger patients reported more OHRQOL impacts. This implies that the impact of oral disease decreased with age. This may also be because we find older patients more likely to persevere or be more accepting of their fate. They also feel that these are problems associated with aging and part of life.

A significant relationship was established between gender and *psychological discomfort*. This is supported by Mersel et al (1995) who found that male patients are often more satisfied with their dentures regarding comfort, function and appearance. Ethnicity was not explored as a variable because of the small sample size and the uneven distribution of population groups.

5.5.2 OHIP-EDENT (post-treatment) and socio-economic indicators

In contrast to other studies (Chavers et al, 2002; John et al, 2003; John et al, 2004b), this study found that the less educated patients had a better quality of life than those who were better educated. A significant

relationship was found between education level and OHRQOL. The level of education could be used as predictor for OHRQOL.

A lower level of education may imply a certain level of ignorance as pertaining to oral health. They may also feel helpless and expect the 'professional' to guide them and in most cases, make the decision for them regarding their oral health.

In this study, patients who had a higher salary generally reported more impacts than those who earned a lower salary. One could argue that the lower income group were grateful for affordable treatment and would cope with any problems. They had fewer expectations regarding treatment and was less demanding than those who earned a higher salary.



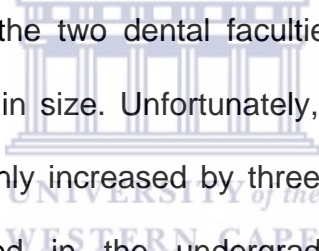
5.5.3 OHIP-EDENT (post-treatment) and dental history

Patients who had been edentulous for more than 30 years generally scored lower impacts in all domains, as they were more familiar with what to expect from a new denture. They are also less likely to complain because they may feel that they could still function. Patients who have had no previous denture experience scored higher than those with some denture experience.

5.5.4 OHIP-EDENT (post-treatment) and level of clinical experience

Patients who were treated by junior dental students (third and fourth year students) scored generally higher in all domains as compared to those

treated by the more senior students. The highest scores were reported in the *physical pain* domain with the junior students scoring the higher score. Acute impacts from the new dentures may result in these high impacts on OHRQOL. One can argue that because the junior students have less clinical experience their patients could have been disadvantaged. However, the junior students had the same clinical supervisors as their more senior students. Every attempt is also made to ensure that every group of four students is assigned to a clinical supervisor. This is to ensure that these students benefit from more personal attention whilst learning the techniques of complete denture construction.



Following the merger of the two dental faculties in the Western Cape, classes were quadrupled in size. Unfortunately, the teaching staff in the Prosthetics Department only increased by three clinical supervisors (full-time) who were involved in the undergraduate teaching. General consensus amongst full-time and sessional staff is that these large classes have made it difficult to spend quality time with students in the teaching area. The results of this study may imply that additional teaching staff is required and the intake of dental students should be reviewed.

The number of post-treatment visits was not included in the data. It would have been interesting to note if it affected the results in any manner.

5.5.5 OHIP-EDENT (post-treatment) and OHIP-EDENT (baseline)

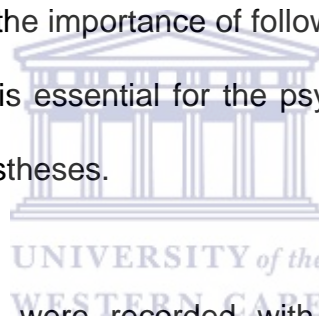
The paired mean differences showed positive improvements across all domains except *physical pain* and *physical disability*. However, these small negative results could be attributed to the new complete dentures. Some patients were experiencing post-treatment pain, which subsequently affected their normal eating.

The OHIP-EDENT summary scores indicated an improvement of 8 units. The findings of this study confirmed that of John et al (2004a) and Heydecke et al (2003) that there is an improvement in the initial scores. However, the magnitude of improvement in OHRQOL observed here was not as great as reported by them. Differences in patient populations and sampling variability may be responsible. In studies investigating complete denture patients, they consistently have a poorer OHRQOL than implant patient groups (Awad et al, 2003a; Allen et al, 2001). Compared with the results of this study, summary scores before and after prosthodontic treatment were lower than those reported in a study conducted by John et al (2004a) when mean OHIP-G-49 values were compared. While this may indicate that the patients in this study have a poorer overall OHRQOL than the German patients, results from both studies are consistent in demonstrating improvements in OHRQOL following treatment. The findings of this study support the belief that patients benefit from properly fitting dentures. Garret et al (1996) reported similar findings, where almost

all the patients perceived improvement in masticatory function, speech and security.

The results of this study suggest that the OHIP-EDENT is able to detect oral health changes over time and to measure the effects of oral treatments. This is in accordance with previous longitudinal studies where patients who benefited from the placement of new dentures saw their quality of life improve (Veyrune et al, 2005). The OHIP-EDENT may be used as a tool to measure treatment outcomes.

These results emphasise the importance of follow-up of patients during the period of adaptation that is essential for the psychological and functional integration of the new prostheses.



Significant improvements were recorded with regard to *psychological discomfort, psychological disability, social disability and handicap*. This clearly illustrates a need to understand how the improved fit, aesthetics and comfort of a new complete denture impacts on the patients' OHRQOL.

CHAPTER 6

CONCLUSION

6.1 Clinical implications

In view of the results of this study, what can be of practical use in the clinic, what should the dental practitioner do?

The importance of providing patients' with high quality dentures should be self-evident, if for no other reason than to avoid harmful effects on the oral tissues. It has now been proven that patients who are satisfied have a better quality of life than their dissatisfied counterparts. Clinicians should familiarise themselves with the patient's expectations and inform them of possible limitations. Dentists should spend more time counseling the edentulous patients prior to and during denture construction. Clinicians should also recognise the important role they play in improving a patient's quality of life aside from just manufacturing a complete denture for functional purposes.

In this study, the average patient became edentulous at the age of 34 years. This implies that patient education, health promotion and oral health awareness is lacking in the Western Cape. While this may have more implications for the State, as dentists we need to educate our patients and prevent this early loss of teeth.

6.2 Conclusions

The findings of this study provide the first overview of impaired OHRQOL in complete denture wearers in the Western Cape.

The analyses of these results provide evidence for the following:

1. The study showed that complete dentures do improve the quality of life of patients. Significant improvements were recorded in almost all domains. These results are relevant for clinicians in drawing on evidence about the benefits of treatment when advising patients about whether treatment will improve their oral function and everyday lives.
2. Demographic variables such as gender, age and income level had a weak relationship with OHRQOL. The results of this study found Education to be a predictor of OHRQOL. However, the small number of male patients and the small number of patients who were from a higher income group were limitations.
3. Denture satisfaction was a significant predictor of OHRQOL.
4. The findings of this study have educational implications for the training of dental undergraduate and postgraduate students. There is a need to incorporate the social and psychological impact of dental disease in the process of treatment planning.
5. The OHIP-EDENT may be used as a tool to measure treatment outcomes.
6. The results of this study also acknowledges the level of training the Prosthetic Department of the University of the Western Cape provides

to its undergraduate students with the high rate of satisfied complete denture patients.

6.3 Recommendations

1. A study with larger numbers of patients from different regions may provide results more representative of the South African population.
2. Future studies should also include the age of the denture and clinical examination of the patients' denture as additional variables.
3. The findings of this study could also serve as motivation for a more vigorous national plan with regards to oral health. The high prevalence of edentulism clearly suggests that the levels of tooth loss are not decreasing. The high rate of decay and periodontal disease in South Africa also contributes to this problem. As a result, we need to make oral health a more affordable and attractive alternative to extracting teeth and replacing them with complete dentures. The public needs to be made aware of the importance of oral health to their quality of life. In the Western Cape, the Dental school should take up the challenge in changing the perceptions of the public regarding oral health.
4. Currently, Public Health Services place a low priority on the provision of dentures. Complete denture construction is viewed as a resource intensive service and cannot be justified as a priority. Other demands such as housing, education and primary health care are given preference. The results of this study and future research could be used to motivate for more appropriate resource allocation. At the moment

few dental clinics provide a denture service, with the result that most patients are referred to the teaching hospitals for treatment. The shortage of personnel in the academic hospitals means that lengthy waiting lists are the norm. The Health Services should explore the possibility of creating more service rendering posts at the community dental clinics and providing them with a budget to comprehensively treat patients.

5. The student-teacher ratio in the Prosthetics Department should be reviewed. Also, innovative teaching techniques should be explored to better cope with the larger classes.



BIBLIOGRAPHY

Agerberg G, Carlsson GE. Chewing ability in relation to dental and general health; analyses of data obtained from a questionnaire. *Acta Odontol Scand* 1981;39:147-53.

Allen PF, Locker D. A modified short version of the Oral Health Impact Profile for assessing health-related quality of life in edentulous adults. *Int J Prosthodont* 2002;15:446-50.

Allen PF, McMillan AS. An assessment of sensitivity to change of the Oral Health Impact Profile in a clinical trial. *Community Dent Oral Epidemiol* 2001;29:175-82.



Allison P, Locker D, Jokovic A, Slade G. A cross-cultural study of oral health values. *J Dent Res* 1999;78:643-9.

Atchison KA, Dolan T. Development of the Geriatric Oral Health Assessment Index. *J Dent Educ* 1990;54:680-6.

Atwood DA. Reduction of residual ridges: A major oral disease entity. *J Prosthet Dent* 1971;26:266-78.

Awad MA, Locker D, Korner-Bitensky N, Feine J. Measuring the effect of implant rehabilitation on oral health-related quality of life in a randomized controlled clinical trial. *J Dent Res* 2000;79:1659-63.

Awad MA, Lund JP, Dufresene E, Feine JS. Comparing the efficacy of mandibular implant-retained overdentures and conventional dentures among middle-aged edentulous patients: satisfaction and functional assessment. *Int J Prosthodont* 2003a;16:117-22.

Awad MA, Lund JP, Shapiro S, Locker D, Klemetti E, Chehade A, Savard A, Feine JS. Oral health status and treatment satisfaction with mandibular implant overdentures and conventional dentures: A randomized clinical trial in a senior population. *Int J Prosthodont* 2003b;16:390-6.

Baer ML, Elias SA, Reynolds MA. The use of psychological measures in predicting patient satisfaction with complete dentures. *Int J Prosthodont* 1992;5:221-6.

Berg E. A 2-year follow-up study of patient satisfaction with new complete dentures. *J Dent* . 1988;16:160-5.

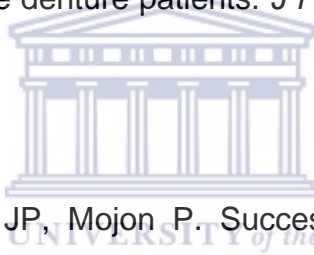
Berg E. Acceptance of full dentures. *Int Dent J*. 1993;43:299-306.

Bergman B, Carlsson G, Hedegard B. A longitudinal two-year study of a number of full denture cases. *Acta Odontol Scand* 1964;22:3-26.

Bergman B, Carlsson G. Review of 54 complete denture wearers patients' opinion 1 year after treatment. *Acta Odontol Scand* 1972;30:399-414.

Bergner M, Bobbitt B. The Sickness Impact Profile. *Med Care* 1981;19: 787-805.

Bolender CL, Swoope CC, Smith DE. The Cornell Medical Index as a prognostic aid for complete denture patients. *J Prosthet Dent* 1969;22: 20-9.



Budtz-Jorgensen, Chung JP, Mojon P. Successful aging- the case for prosthetic therapy. *J Public Health Dent* 2000; 60:308-12.

Carey PF. Complete dentures-a review of the 1976 literature. *J Dent Assoc S Afr* 1978;33:67-71.

Carlsson GE, Otterland A, Wennstrom A. Patient factors in appreciation of complete dentures. *J Prosthet Dent* 1967;17:322-8.

Carr L, Essop ARM, Grave AMH, Kotkin H, Roets R, Shackelton J, Rossouw C, Slabbert JCJ, Tau S, Weg R, Wolfaardt J. Prosthetic dentistry- selected topics from the recent literature. *J Dent Assoc S Afr* 1985; 40:713-21.

Carstens IL, Hartshorne JE, Louw AJ, Barrie RB, Jordaan E. An Epidemiological survey of farm workers in the Boland. Part V: Denture status and treatment needs. *CHASA J Comprehensive Health* 1995;6:11-17.

Chavers LS, Gilbert GH, Shelton BJ. Racial and socioeconomic disparities in oral disadvantage, a measure of oral health-related quality of life: 24-month incidence. *J Public Health Dent* 2002;62:140-7.

Cushing AM, Sheiham A, Maizels J. Developing socio-dental indicators- the social impact of dental disease. *Community Dent Health* 1986;3:3-17.

Davis EL, Tedesco LA, Albino JE, Portenoy BS, Ortman LF. Expectations and satisfaction of denture patients in a university clinic. *J Prosthet Dent* 1986;55:59-63.

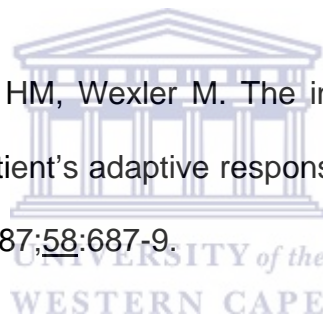
Du Plessis JB, Rossouw LM, Smit J, Lichter G. Prosthetic status and Treatment Needs of the Adult Population of South Africa. *National Oral Health Survey*:1989:93-101.

Fenlon MR, Sherriff M, Walter JD. An investigation of factors influencing patients' use of new complete dentures using structural equation modeling techniques. *Community Dent Oral Epidemiol* 2000;28:133-40.

Fenlon MR, Sherriff M. Investigation of new complete denture quality and patients' satisfaction with and use of dentures after two years. *J Dent* 2004;32:327-33.

Fiske J, Davis DM, Frances C, Gelbier S. The emotional effects of tooth loss in edentulous people. *Br Dent J* 1998;184:90-3.

Friedman N, Landesman HM, Wexler M. The influences of fear, anxiety and depression on the patient's adaptive responses to complete dentures. Part I. *J Prosthet Dent* 1987;58:687-9.



Friedman N, Landesman HM, Wexler M. The influences of fear, anxiety and depression on the patient's adaptive responses to complete dentures. Part II. *J Prosthet Dent* 1988;59:45-8.

Friedman N, Landesman HM, Wexler M. The influences of fear, anxiety and depression on the patient's adaptive responses to complete dentures. Part III. *J Prosthet Dent* 1988;59:169-73.

Garrett NR, Kapur KK, Perez P. Effects of improvements of poorly fitting dentures and new dentures on patient satisfaction. *J Prosthet Dent* 1996;76:403-13.

Guckes AD, Smith DE, Swoope CC. Counseling and related factors influencing satisfaction with dentures. *J Prosthet Dent* 1978;39:259-67.

Gunne HS, Bergman B, Embom L, Hogstrom J. Masticatory efficiency of complete denture patients: A clinical examination of potential changes at the transition from old to new denture. *Acta Odontol Scand* 1982;40:289-97.

Haraldson T, Karlsson U, Carlsson GE. Bite force and oral function in complete denture wearers. *J Oral Rehabil* 1979;6:41-8.



Hartshorne J. Edentulousness and complete denture care in the Western Cape Province with specific reference to the need for and feasibility of establishing denturists as a new occupational category in the oral health care work force. PhD. Thesis Volume I. Stellenbosch. University of Stellenbosch, 1998.

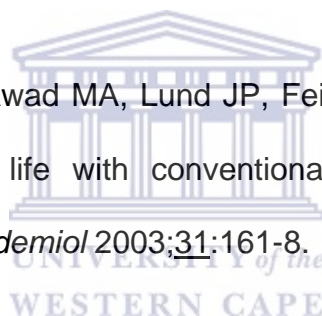
Hartshorne J, Carstens I. Denture requirements of indigents in the Western Cape region. *J Dent Assoc S Afr.* 1991;46:365-8.

Heath MR. The effect of maximum biting force and bone loss upon masticatory function and dietary selection of the elderly. *Int Dent J* 1982;32:345-56.

Helkimo E, Carlsson GE, Helkimo M. Bite force and state of dentition. *Acta Odontol Scand* 1977;35:297-303.

Hendricks SJH, Wilson V, Angellilo I. Patient satisfaction and dentist evaluation of dentures in South Africa. *J Dent Assoc S Afric.* 1996; 51:143-7.

Heydecke G, Locker D, Awad MA, Lund JP, Feine JS. Oral and general health-related quality of life with conventional and implant dentures. *Community Dent Oral Epidemiol* 2003;31:161-8.



Heydecke G, Tedesco LA, Kowalski C, Inglehart MR. Complete dentures and oral health-related quality of life-do coping styles matter? *Community Dent Oral Epidemiol* 2004;32:297-306.

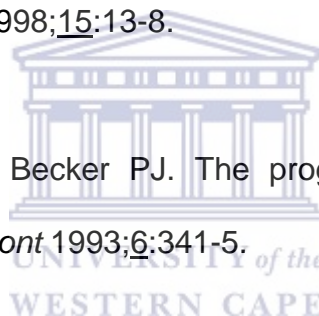
John MT, LeResche L, Koepsell TD, Hujoel P, Miglioretti DL, Micheelis W. Oral health-related quality of life in Germany. *Eur J Oral Sci* 2003;111:483-91.

John MT, Slade GD, Szentpetery A, Setz JM. Oral health–related quality of life in patients treated with fixed, removable, and complete dentures 1 month and 6 to 12 months after treatment. *Int J Prosthodont* 2004a;17:503-11.

John MT, Koepsell TD, Hujoel P, Miglioretti DL, Micheelis W. Demographic factors, denture status and oral health-related quality of life. *Community Dent Oral Epidemiol* 2004b;32:125-32.

Jones J. Using oral quality of life measures in geriatric dentistry. *Community Dent Health* 1998;15:13-8.

Kotkin H, Slabbert JCJ, Becker PJ. The prognostic value of denture complaints. *Int J Prosthodont* 1993;6:341-5.



Langer M, Michman J, Seifert I. Factors influencing satisfaction with complete dentures in geriatric patients. *J Prosthet Dent* 1961;11:1019-31.

Lindquist LW, Carlsson GE, Hedegard B. Changes in bite force and chewing efficiency after denture treatment in edentulous patients with adaptation difficulties. *J Oral Rehabil* 1986;13:21-9.

Locker D. *An Introduction to Behavioural Science and Dentistry*. London: Tavistock and Routledge, 1989.

Louw NP, Moola MH. The dental needs and demands of the Cape Coloured people in the Cape Peninsula. *J Dent Assoc S Afri* 1979; 34:715-8.

Louw NP. Dental needs and demands of the Coloured population of the Cape Peninsula and the planning of a dental health service for members thereof. PhD. Thesis Volume II. Stellenbosch. University of Stellenbosch, 1982.

Magnusson T. Clinical judgment and patients' evaluation of complete dentures five years after treatment. A follow-up study. *Swed Dent J* 1986; 10:29-35.



Manne S, Mehra R. Accuracy of perceived treatment needs among geriatric denture wearers. *Gerodontology* 1983;2:67-71.

Mersel A, Babayof I, Berkey D, Mann J. Variables affecting denture satisfaction in Israeli elderly: a one-year follow-up. *Gerodontology* 1995; 12:89-94.

McGarry T, Nimmo A, Skiba JF, Ahlstrom RH, Smith CR, Koumjian JH. Classification system for complete edentulism. *J Prosthet Dent* 1999;8:27-39.

McGrath C, Bedi R. Oral health related quality of life- views of the public in the United Kingdom. *Community Dent Health* 2000;17:3-7.

McGrath C, Bedi R. An evaluation of a new measure of oral health related quality of life- OHRQoL-UK(W)©. *Community Dent Health* 2001a;18:138-43.

McGrath C, Bedi R. Can dentures improve the quality of life of those who have experienced considerable tooth loss? *J Dent* 2001b;29:243-6.

McMillan AS, Wong MC. Emotional effects of tooth loss in community – dwelling elderly people in Hong Kong. *Int J Prosthodont* 2004;17:172-6.

Michael CE, Javid NS, Colaizzi FA, Gibbs CH. Biting strength and chewing forces in complete denture wearers. *J Prosthet Dent* 1990;63:549-53.

Naidoo S, Chikte UM, Moola H, Steyn K. Perceptions of oral health: The South African Demographic and Oral Health Survey (DOHS) of 1998. *SADJ* 2001;56:505-10.

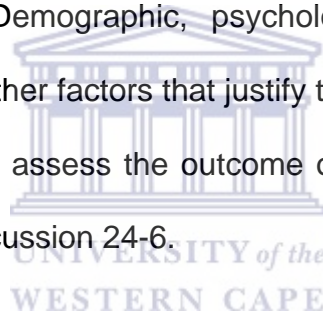
Naude DA, Van Rooy HK, Faber HS, Barrie RB. Complete upper and lower dentures: Results from the sociological questionnaire of the National Oral Health Survey. National Oral Health Survey South Africa 1989. In:

Report of the first National Oral Health Survey of South Africa, pp 102-8.
Department of Health, 1994.

Nowjack-Raymer RE and Sheiham A. Association of edentulism and diet and nutrition in US Adults. *J Dent Res* 2003;82:123-6.

Osteberg T, Carlsson GE, Tsuga K, Sundh V, Steen B. Associations between self-assessed masticatory ability and some general health factors in a Swedish population. *Gerodontology* 1996;13:110-7.

Owen CP, Locker D. Demographic, psychological, sociological, and economic variables and other factors that justify the need for prosthodontic services, and that help to assess the outcome of care. *Int J Prosthodont* 2003;16 Suppl:19-20: discussion 24-6.



Peltola MK, Raustia AM, Salonen MA. Effect of complete denture renewal on oral health – a survey of 42 patients. *J Oral Rehabil* 1997; 24:419-25.

Reeve PE, Watson CJ, Stafford GD. The role of personality in the management of complete denture patients. *Br Dent J* 1984;156:356-62.

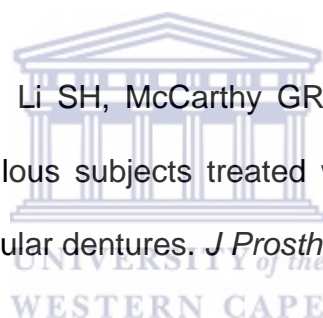
Reisine ST. Theoretical considerations in formulating socio-dental indicators. *Soc Sci Med* 1981;6:745-50.

Reisine ST, Fertig J, Weber J, Leder S. Impact of dental conditions on patient's' quality of life. *Community Dent Oral Epidemiol* 1989;17:7-10.

Rise J, Heloe LA. Oral conditions and treatment need in an elderly population in Northern Norway. *Community Dent Oral Epidemiol* 1978;6:6-11.

Sandstrom B, Lindquist LW. The effect of different prosthetic rehabilitations on the dietary selection in edentulous patients. *Acta Odontol Scand* 1987;45:423-8.

Sebring NG, Guckes AD, Li SH, McCarthy GR. Nutritional adequacy of reported intake of edentulous subjects treated with new conventional or implant-supported mandibular dentures. *J Prosthet Dent* 1995;74:358-63.



Slade GD, Spencer A. Development and evaluation of the Oral Health Impact Profile. *Community Dent Health* 1994;11:3-11.

Slade GD. Derivation and validation of a short-form oral health impact profile. *Community Dent Oral Epidemiol* 1997;25:284-90.

Slade GD, Strauss RP, Atchison KA, Kressin NR, Locker D, Reisine ST. Conference summary: Assessing oral health outcomes-measuring health status and quality of life. *Community Dent Health* 1998;15:3-7.

Slagter AP, Olthoff LW, Bosman F, Steen WH. Masticatory ability, denture quality, and oral conditions in edentulous subjects. *J Prosthet Dent* 1992;68:299-307.

Smith JE, Sheiham A. How dental conditions handicap the elderly. *Community Dent Oral Epidemiol* 1979; 7:305-10.

Smith JE, Sheiham A. Dental treatment needs and demands of an elderly population in England. *Community Dent Oral Epidemiol* 1980;8:360-4.

Smith M. Measurement of personality traits and their relation to patient satisfaction with complete dentures. *J Prosthet Dent* 1976;35:492-503.

Steele JG, Sanders AE, Slade GD, Allen PF, Lahti S, Nuttall N, Spencer AJ. How do age and tooth loss affect oral health impacts and quality of life? A study comparing two national samples. *Community Dent Oral Epidemiol* 2004;32:107-14.

Strassburger C, Heydecke G, Kerschbaum T. Influence of prosthetic and implant therapy on satisfaction and quality of life: A systematic review. *Int J Prosthodont* 2004;17:83-93.

Strauss RP, Hunt RJ. Understanding the value of teeth to older adults: influences on the quality of life. *J Am Dent Assoc* 1993;124:105-10.

Tallgren A. Positional changes of complete dentures. A 7-year longitudinal study. *Acta Odontol Scand* 1969;27:539-61.

Tallgren A, Lang BR, Miller RL. Longitudinal study of soft tissue profile changes in patients receiving immediate complete dentures. *Int J Prosthodont* 1991;4:9-16.

Treasure E, Kelly M, Nuttall N, Nunn J, Bradnock G, White D. Factors associated with oral health. *Br Dent J* 2001;190:60-8.

Van Waas M. The influence of clinical variables on patients' satisfaction with complete dentures. *J Prosthet Dent* 1990a;63:307-10.

Van Waas M. Determinants of dissatisfaction with dentures: A multiple regression analysis. *J Prosthet Dent* 1990b;64:569-72.

Van Waas M. The influence of psychologic factors on patient satisfaction with complete dentures. *J Prosthet Dent* 1990c;90:545-8.

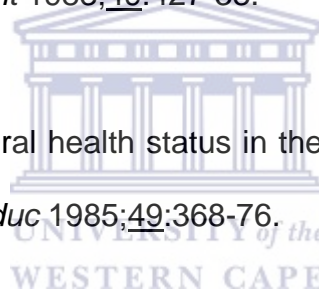
Van Wyk CW, Farman AG, Staz J. Oral health status of institutionalized elderly Cape Coloureds from the Cape Peninsula of South Africa. *Community Dent Oral Epidemiol* 1977; 5:179-184.

Veyrune JL, Tubert-Jeannin S, Dutheil C, Riordan PJ. Impact of new prostheses on the oral health related quality of life of edentulous patients. *Gerodontology* 2005;22:3-9.

Watermeyer GJJ, Thomas CJ, Van Wyk CW. The oral health status of elderly whites in the Cape Peninsula area. *J Dent Assoc S Afric* 1981;36:861-6.

Wayler AH, Chauncey HH. Impact of complete dentures and impaired natural dentition on masticatory performance and food choice in healthy aging men. *J Prosthet Dent* 1983;49:427-33.

Weintraub JA, Burt BA. Oral health status in the United States: tooth loss and edentulism. *J Dent Educ* 1985;49:368-76.



Weinstein M, Schuchman J, Lieberman J. Age and denture experience as determinants in patient denture satisfaction. *J Prosthet Dent* 1988;59:327-9.

Wolff A, Gadre A, Begleiter A, Moskana D, Cardash H. Correlation between patient satisfaction with complete dentures and denture quality, oral condition and flow rate of submandibular/sublingual salivary glands. *Int J Prosthodont* 2003;16:45-8.

Wood P. The language of disablement: a glossary relating to disease and its consequences. *Int J Rehabil* 1980;2:86-92.

World Health Organisation. Oral health Surveys. Basic Methods. Geneva; WHO, 1977.

World Health Organisation. *International classification of impairments, disabilities and handicaps*. Geneva: WHO, 1980.

World Health Organisation. Recommendations for preventing dental diseases (Online). 2003

[http://www.who.int/oral health/publications/orh_cdoe05_vol33.pdf](http://www.who.int/oral%20health/publications/orh_cdoe05_vol33.pdf)

Yoshida M, Sato Y, Akagawa Y, Hiasa K. Correlation between quality of life and denture satisfaction in elderly complete denture wearers. *Int J Prosthodont* 2001;14:77-80.

Yoshizumi DT. An evaluation of factors pertinent to the success of complete denture service. *J Prosthet Dent* 1964;14:866-78.

APPENDICES

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Appendix I

INFORMATION AND INFORMED CONSENT DOCUMENT

TITLE OF THE RESEARCH PROJECT: ...Quality of life and dentures.

REFERENCE

NUMBER

.....

PRINCIPAL INVESTIGATOR: DR RAZIA ADAM

Address: DIVISION OF PROSTHODONTICS

SCHOOL OF ORAL HEALTH SCIENCES

D-LEVEL, RM 3032

**DECLARATION BY OR ON BEHALF OF PATIENT/*PARTICIPANT:
I,THE UNDERSIGNED,**

..... (name)

[ID No:] the patient/*participant or* in my capacity as

..... of the patient/*participant [ID No:

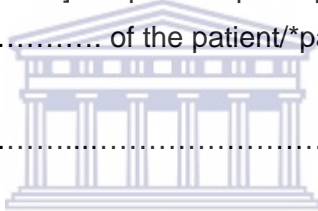
.....] of

.....

.....

.....

. (address).



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A. HEREBY CONFIRM AS FOLLOWS:

1. I/*The patient/*participant was invited to participate in the abovementioned research project which is being undertaken by the Department OF Prosthetic Dentistry, Faculty of dentistry, University of the Western Cape.
2. The following aspects have been explained to me/*the patient/*participant:
 - 2.1 **Aim:** To determine whether dentures improve the quality of life of patients.
 - 2.2 **Procedures:** A set of full-full dentures will be made for you as part of

your routine treatment. You will be asked a number of questions relating to oral problems that you may have experienced in the last 4 weeks. The aim is to try and establish how these problems have affected your quality of life. You will be requested to respond to a set of standard questions prior to you commencing treatment. Your participation in this study consists of two interviews, i.e. a pretreatment interview on your first visit and a post treatment interview 3 months later following the receipt of your new dentures. Each interview should last no longer than 15 minutes. To control for bias, subjects to be recruited for the study are to be assured that the research workers are not involved in their treatment and that their participation in the study would not influence the outcome of their treatment

2.3 **Confidentiality:** The information is strictly confidential and although the findings will be reported on at a scientific meeting or in a scientific publication you will not be identified.

2.4 **Voluntary participation/refusal/discontinuation:** You are completely free to take part in the study, in which case you need to sign the attached consent form. You also have the right to refuse or withdraw from the study at any time without it affecting your future treatment. If you decide against participating, it will not be held against you and you will still receive treatment as specified in your file

3. The information above was explained to me/*the patient/*participant by (name of relevant person) in Afrikaans/*English/*Xhosa/*Other and I am/*the participant/*patient is in command of this language/*it was satisfactorily translated to me/*him/*her by

(name of translator). I/*The participant/*patient was given the opportunity to ask questions and all these questions were answered satisfactorily.

4. No pressure was exerted on me/*the patient/*participant to consent to participation and I/*the participant/*patient understand(s) that I/*the participant/*patient may withdraw at any stage without any penalization.
5. Participation in this study will not result in any additional costs to myself/*the participant/*patient nor will I be paid.

B. I HEREBY CONSENT VOLUNTARILY TO PARTICIPATE IN THE ABOVEMENTIONED PROJECT/*THAT THE PATIENT/*POTENTIAL PARTICIPANT MAY PARTICIPATE IN THE ABOVEMENTIONED STUDY.



Signed/confirmed at on
.....20.....
.....(place).....
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.....
*Signature or right thumb print of patient/*representative of the patient/*participant*

.....
Signature of witness

STATEMENT BY OR ON BEHALF OF INVESTIGATOR(S):

I,
declare that

- I explained the information given in this document to *(name of the patient/*participant)* and/*or his/*her representative *(name of the representative)*;
- he/*she was encouraged and given ample time to ask me any questions;
- this conversation was conducted in Afrikaans/*English/*Xhosa/*Other and no translator was used/*this conversation was translated into *(language)* by *(name)*.

Signed at on
.....20*(place)*.....
.....*(date)*.....



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Signature of investigator/*investigator's representative

.....

Signature of witness

DECLARATION BY TRANSLATOR:

I,(name),

confirm that I

- translated the contents of this document from English into(indicate the relevant language) to the patient/*the patient's representative/*participant;
- explained the contents of this document to the patient/*participant/*patient's representative;
- also translated the questions posed by(name), as well as the answers given by the investigator/*the investigator's representative; and
- conveyed a factually correct version of what was related to me.

Signed at on20

.....
(place).....(date).....

Signature of translator

.....

Signature of witness

*Delete where not applicable

**IMPORTANT MESSAGE TO PATIENT/*REPRESENTATIVE OF
PATIENT/*PARTICIPANT:**

Dear patient/*representative of the patient/*participant,

Thank you for your/*the patient's participation in this study. Should, at any time during the study,

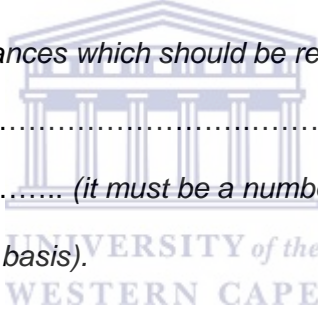
- an emergency arise as a result of the research, or
- you require any further information with regard to the study, or
- the following occur

.....

.....

(indicate any circumstances which should be reported to the investigator)

kindly contact(name) at telephone
number *(it must be a number where help will be
available on a 24 hour basis).*



*Delete where not applicable

Appendix II

Record Number:

--	--	--

Patient details

Name and Surname:

Contact Details:

Address:.....

.....

.....Code:.....

Tel (w)

(h)

(cell)

Gender:

Male	Female
------	--------

Date of Birth:



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y	y	y	y	m	m	d	d
---	---	---	---	---	---	---	---

Ethnic Group:

Black	
Asian	
Colour ed	
White	

Educational Qualifications:

Primary (up to std 5)	
Secondary (up to std 9)	
Matric	
Tertiary	

Employment status:

Employed	Self-employed	Unemployed	Pensioner
----------	---------------	------------	-----------

Income per month:

R 0	-	R 1.666	
R 1.667	-	R 2.166	
R 2.167	-	R 3.166	
R 3.167		and more	

Dental history

History of denture experience

None	
Short (<= 5 yrs)	
Long (> 5 yrs)	

How long have you not had **any teeth** in your whole mouth?

Do you suffer from any of the following medical conditions?

Osteoporosis	
Hypertension (High Blood Pressure)	
Diabetes	

Has it been confirmed by a medical doctor?



Yes	
No	

We would like to contact you again by telephone in 3 months. Because you might move between now and then, we would like the name and address and telephone number of a person who will know where you will be. We will contact this person only if we cannot locate you.

Contact person details:

Name and Surname:.....

Relationship:.....

Address:.....

.....

.....Code:.....

Telephone: (.....).....

.....

THANK YOU FOR YOUR TIME.

Appendix III

ORAL HEALTH IMPACT PROFILE FOR EDENTULOUS ADULTS

Questions and weights for the Oral Health Impact Profile for edentulous Adults.

Questions to respondents should also indicate the desired time period (e.g., during the last 4 weeks).

Response categories for all questions:

4= very often; 3= fairly often; 2= occasionally; 1= hardly ever; 0= never/ don't know.

Dimension * Weight Question
Response

FL	1.253	1.	Have you had difficulty chewing any foods because of problems with your teeth, mouth or dentures?	
FL	1.181	2.	Have you had food catching in your teeth or dentures?	
P1	1.213	3.	Have you had painful aching in your mouth?	
P1	0.998	4.	Have you found it uncomfortable to eat any foods because of problems with your teeth, mouth or dentures?	
P1	1.264	5.	Have you had sore spots in your mouth?	
FL	1.472	6.	Have felt that your dentures have not been fitting properly?	
P1	1.002	7.	Have you had uncomfortable dentures?	
P2	2.006	8.	Have you been worried by dental problems?	
P2	1.902	9.	Have you been self-conscious because of your teeth, mouth or dentures?	
D1	1.266	10.	Have you had to avoid eating some foods because of problems with your teeth, mouth or dentures?	
D1	1.351	11.	Have you been unable to eat with your dentures because of problems with them?	
D1	0.952	12.	Have you had to interrupt meals because of problems with your teeth, mouth or dentures?	
D2	1.393	13.	Have you been upset because of problems with your teeth, mouth or dentures?	
D2	1.437	14.	Have you been a bit embarrassed because of problems with your teeth, mouth or dentures?	
D3	1.572	15.	Have you avoided going out because of problems with your teeth, mouth or dentures?	
D3	2.555	16.	Have you been less tolerant of your partner or family because of problems with your teeth, mouth or dentures?	
D3	2.236	17.	Have you been irritable with other people because of problems with your teeth, mouth or dentures?	

H	1.545	18. Have you been unable to enjoy other peoples company as much because of problems with your teeth, mouth or dentures?	
H	1.567	19. Have you felt that life in general was less satisfying because of problems with your teeth, mouth or dentures?	

KEY

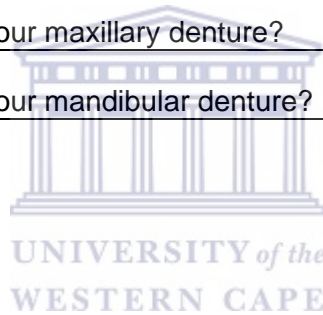
- FL = Functional limitation**
- P1 = Physical pain**
- P2 = Psychological discomfort**
- D1 = Physical disability**
- D2 = Psychological disability**
- D3 = Social disability**
- H = Handicap**

Global Rating of Satisfaction (post-treatment)

Response categories for questions:

1= totally satisfied, 2= very satisfied, 3= reasonably satisfied, 4= not very satisfied and 5= not at all satisfied

1.	Are you satisfied with your maxillary denture?	
2.	Are you satisfied with your mandibular denture?	



Appendix IV :

Table 9 :Summary of OHIP-EDENT (Baseline) scores

Domain	OHIP-EDENT (Baseline)Questions	Frequency					Mean	Std Dev	Frequency % Combined 2,3,4
		0	1	2	3	4			
FL	1. Have you had difficulty chewing any foods because of problems with your teeth, mouth or dentures?	18	2	9	9	25	2.33	1.68	68
FL	2. Have you had food catching in your teeth or dentures?	24	7	12	7	13	1.65	1.58	51
P1	3. Have you had painful aching in your mouth?	34	3	11	8	7	1.22	1.49	42
P1	4. Have you found it uncomfortable to eat any foods because of problems with your teeth, mouth or dentures?	17	7	13	9	17	2.03	1.57	62
P1	5. Have you had sore spots in your mouth?	36	5	10	3	9	1.11	1.5	35
FL	6. Have you felt that your dentures have not been fitting properly?	30	6	6	5	15	1.63	2	44
P1	7. Have you had uncomfortable dentures?	35	4	10	2	12	1.24	1.6	38
P2	8. Have you been worried by dental problems?	26	7	10	11	9	1.52	1.52	48
P2	9. Have you been self-conscious because of your teeth, mouth or dentures?	27	1	7	8	20	1.89	1.58	56
D1	10. Have you had to avoid eating some foods because of problems with your teeth, mouth or dentures?	17	5	12	10	19	2.14	1.6	65
D1	11. Have you been unable to eat with your dentures because of problems with them?	37	6	8	6	6	1.02	1.41	33
D1	12. Have you had to interrupt meals because of problems with your teeth, mouth or dentures?	29	4	10	10	10	1.49	1.58	48
D2	13. Have you been upset because of problems with your teeth, mouth or dentures?	31	2	10	9	11	1.48	1.61	48
D2	14. Have you been a bit embarrassed because of problems with your teeth, mouth or dentures?	34	4	8	5	12	1.32	1.62	40
D3	15. Have you avoided going out because of problems with your teeth, mouth or dentures?	40	3	6	7	7	1.02	1.49	31

D3	16. Have you been less tolerant of your partner or family because of problems with your teeth, mouth or dentures?	45	5	3	1	9	0.79	1.45	21
D3	17. Have you been irritable with other people because of problems with your teeth, mouth or dentures?	44	4	6	4	5	0.76	1.32	24
H	18. Have you been unable to enjoy other peoples company as much because of problems with your teeth, mouth or dentures?	43	3	9	3	5	0.79	1.31	27
H	19. Have you felt that life in general was less satisfying because of problems with your teeth, mouth or dentures?	42	2	9	6	4	0.86	1.33	30



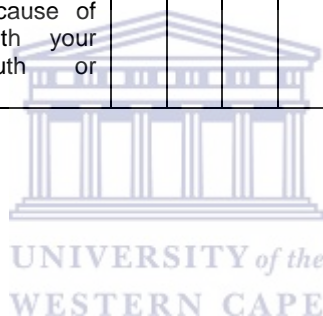
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Appendix V

Table 10: Summary of OHIP-EDENT (Post-treatment) scores

Domain	OHIP-EDENT Questions (Post-treatment)	Frequency					Mean	Std Dev	Frequency % Combined 2,3,4
		0	1	2	3	4			
FL	1. Have you had difficulty chewing any foods because of problems with your teeth, mouth or dentures?	17	7	6	10	23	2.24	1.67	63
FL	2. Have you had food catching in your teeth or dentures?	28	4	10	6	15	1.62	1.67	50
P1	3. Have you had painful aching in your mouth?	27	12	5	6	13	1.46	1.61	39
P1	4. Have you found it uncomfortable to eat any foods because of problems with your teeth, mouth or dentures?	19	12	7	5	20	1.92	1.67	51
P1	5. Have you had sore spots in your mouth?	29	7	8	4	14	1.60	1.96	41
FL	6. Have felt that your dentures have not been fitting properly?	35	2	2	7	17	1.51	1.80	41
P1	7. Have you had uncomfortable dentures?	29	6	5	10	13	1.56	1.66	45
P2	8. Have you been worried by dental problems?	44	1	3	4	11	1.00	1.62	29
P2	9. Have you been self-conscious because of your teeth, mouth or dentures?	41	5	7	3	7	0.89	1.40	27
D1	10. Have you had to avoid eating some foods because of problems with your teeth, mouth or dentures?	27	6	8	5	17	1.67	1.70	48
D1	11. Have you been unable to eat with your dentures because of problems with them?	27	9	8	4	15	1.54	1.64	43
D1	12. Have you had to interrupt meals because of problems with your teeth, mouth or dentures?	32	7	5	3	16	1.43	1.71	38
D2	13. Have you been upset because of problems with your teeth, mouth or dentures?	38	4	8	3	10	1.10	1.54	34
D2	14. Have you been a bit embarrassed because of problems with your teeth, mouth or	46	5	2	3	7	0.73	1.38	19

	dentures?								
D3	15. Have you avoided going out because of problems with your teeth, mouth or dentures?	51	4	1	1	6	0.52	1.24	14
D3	16. Have you been less tolerant of your partner or family because of problems with your teeth, mouth or dentures?	54	1	1	4	2	0.37	1.03	11
D3	17. Have you been irritable with other people because of problems with your teeth, mouth or dentures?	55	1	2	3	2	0.35	0.99	11
H	18. Have you been unable to enjoy other peoples company as much because of problems with your teeth, mouth or dentures?	56	2	1	2	2	0.29	0.91	7
H	19. Have you felt that life in general was less satisfying because of problems with your teeth, mouth or dentures?	55	0	1	4	3	0.41	1.12	13



Appendix VI

Table 11 : OHIP-EDENT (Baseline) and OHIP-EDENT(Post-treatment)

	Mean	Paired differences		
		Mean	Std deviation	Sig
Funclim	7.3	0.34	7.1	0.70
Funclim 2	7			
Phypain	6.2	-1.1	8	0.26
Phypain 2	7.3			
Psychdisc	6.7	2.9	7	0.00*
Psychdisc 2	3.7			
Physdisa	5.5	-0.04	7.3	0.96
Physdisa 2	5.5			
Psychdisa	4	1.4	5.2	0.04*
Psychdisa 2	3			
Socdisa	5.3	2.8	9.3	0.02*
Socdisa 2	2.5			
Handicap	2.6	1.5	4.5	0.01*
Handicap2	1			
Sumscore	37.24	7.58	36.79	0.10
Sumscore 2	29.66			

The shaded areas represent post-treatment scores.



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