



Do patients' expectations influence their satisfaction with complete dentures?

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A thesis submitted in fulfilment of the requirements for the degree of Magister Scientiae (MSc) in the Department of Restorative Dentistry of the University of Western Cape.

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Keywords

Edentulism

Complete dentures

Undergraduate dental student

Patient Expectation

Denture satisfaction

Locus of control

Denture quality

Quality of life

Functional limitations

Physical disability

Psychological discomfort

Physical pain

Psychological disability

Social disability

Handicap



Abstract

Background

Most edentulous patients have expectations regarding complete dentures that are not only dependant on past experiences but also the information they received from others. These expectations may impact on the level of satisfaction the patient would have when receiving their complete dentures. When determining levels of satisfaction, factors such as comfort, speech, aesthetics, mastication, retention, fit / stability and occurrence of pain should be assessed. The dental student should be able to clinically apply theoretical knowledge to provide the patient with a stable and retentive denture that fulfils their expectations on function and aesthetics. Not much has been written regarding this link between patients' expectations and satisfaction with complete dentures at the University of the Western Cape, thus it warranted further investigation.

Aim:

The aim of this study was to determine whether patients' expectations influence their satisfaction with new complete dentures constructed by undergraduate dental students.

Objectives:-

1. To determine the expectations of the edentulous patients prior to receiving new complete dentures.
2. To determine if patients' expectations influences satisfaction with new complete dentures.
3. To investigate the influence of socio-demographic factors on patients' satisfaction wearing complete dentures.
4. To determine if the level of experience of the undergraduate student influences patient satisfaction.

Methodology

This was an observational study using two questionnaires for data collection namely the Patient Expectation Questionnaire and the Oral Health Impact Profile-20. Socio-demographic data was collected as part of the first questionnaire. Each participant was given an individual case number that corresponded on both questionnaires. This facilitated correlation between the expectations and satisfaction results of individual patients.

Results

The age range for the majority of the patients was between 56-65 years. Females made up 72% of the sample with 85% of the sample of coloured ethnicity. Statistical analysis included reliability testing of the Patient Expectation Questionnaire and the Cronbach's Alpha of **.773** was recorded, which indicates good reliability. Results following analysis of the Oral Health Impact Profile-20 showed high levels of satisfaction in most domains. The correlation between patients' expectations and satisfaction with new complete dentures was not proven using Pearson correlation. However, the comparison between the expectations questionnaire and Oral Health Impact Profile-20 frequency distribution showed positive results and most expectations of the patient were met or even exceeded for certain domains.

Conclusion

Once analysis of both questionnaires was completed high levels of expectations were recorded and these expectations were met in most domains. Even though the statistical relationship between patient expectations and satisfaction was not proven, analysis of the questionnaires yielded positive results. No association was found between pre-treatment expectation and patient satisfaction with complete dentures. Some socio-demographic factors influenced patient satisfaction with complete dentures. High levels of patient satisfaction were recorded regardless of the clinical experience of the undergraduate dental student.

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DECLARATION

I declare that this study

**“Do patients’ expectations influence their satisfaction with
complete dentures?”**

is my own work and has not been submitted before for any degree or
examination at any other university. All the sources used or quoted by
me have been referenced and indicated.

Rukshana Ahmed

Student Number: 2563534

Date: 11 March 2016



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Oh my Lord! Advance me in knowledge

[Quran 20:114]

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Abbreviations

CDs- Complete Dentures

UWC- University of the Western Cape

OHC- Oral Health Centre

PEQ- Patient Expectations Questionnaire

OHIP- Oral Health Impact Profile

WHO- World Health Organisation



P-DEQ- Patient Denture Expectation Questionnaire

LOC- Locus of Control

FAD- Functional Assessment of Dentures

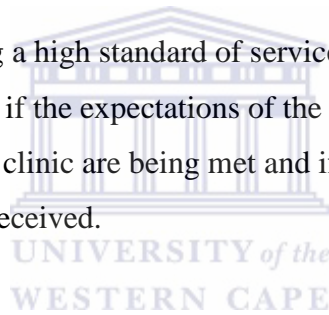
OHRQoL- Oral Health related quality of life

Chapter 1

Problem statement

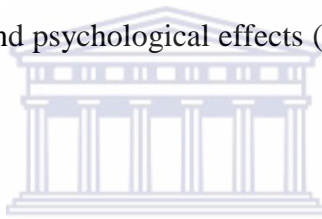
At the University of Western Cape's (UWC) Oral Health Centre (OHC) the Prosthetic Department is inundated with patients requesting Complete Removal Dentures (CDs). These patients are placed on a waiting list once they have been assessed by a dentist employed in the Prosthetic Department. There are different categories on the waiting list based on the clinical presentation of the patient. These categories vary in levels of complexity where some patients are selected to be treated in the prosthetic clinic by an undergraduate dental student under the supervision of a qualified dentist and the remaining patients are treated by the dentists employed in the Prosthetic Department.

On the basis of providing a high standard of service to the community this study was undertaken to assess if the expectations of the edentulous patients treated in the undergraduate dental clinic are being met and if the patients are satisfied with the treatment they have received.



Introduction

A large percentage of the population of South Africa is dependent on the Department of Health for oral health care services. The South African Oral Health system is divided into the private and the public sector. The public sector includes state clinics and clinics affiliated to universities that have dental schools. Oral health services provided in South Africa and developing countries via the public sector predominantly involves dental extractions and limited preventative procedures such as oral hygiene instructions and fluoride treatment (Thorpe, 2006; Van Wyk *et al*, 2004; Reid, 2002; Naidoo *et al*, 2001). This results in an increase in extractions and eventually the increase in both partial and complete edentulism (Emami *et al*, 2013; Van Wyk *et al*, 2004). The consequences of tooth loss and complete edentulism are well documented from poor self-image, nutritional deficiencies and psychological effects (Emami *et al*, 2013; Polzer *et al*, 2010; Carlsson, 2009).



The trends related to edentulism in South Africa are influenced by factors such as gender, socio-economic status and disease prevention (Russell *et al*, 2013; Thorpe, 2006; Hobdell *et al*, 1997). CDs are the most cost-effective treatment option for treating edentulous patients compared to other advanced treatment modalities (Carlsson, 2009; Ivanhoe *et al*, 2002).

CDs are relatively accessible to the vast majority of the population in the private sector, however no state clinics in the Western Cape offer this service to the public (Reid, 2002). Inadequate infra-structure in oral health services contributes to the waiting list that spans several years at the OHC. The patients treated at the OHC range from pensioners to the employed and unemployed South Africans that cannot afford the steep costs of dentures constructed privately. Most edentulous patients have expectations regarding CDs that are not only dependant on past experiences but also on the information they receive from others (Miranda *et al*, 2014; Divaris *et al*, 2012; Marachlioglou *et al*, 2010; de Souza e Silva *et al*, 2009;

Felton, 2009). These expectations may influence the level of satisfaction the patient would have when receiving their CDs.

Patient satisfaction with CDs encompasses multi-factorial aspects of dentistry that are related to the dentist and the patient. Patient factors include: age, demographics, residual ridge form and anatomy. The factors related to the dentist include: denture quality, accuracy of jaw relations, and experience. (Viola *et al*, 2013; Reissmann *et al*, 2011; Critchlow *et al*, 2010; Adam, 2007; Allen *et al*, 2003; Douglass *et al*, 2002; McGrath *et al*, 2001). More specifically, the factors that influence levels of satisfaction include: psychosomatic aspects of the patient, quality of the denture, comfort, speech, aesthetics, mastication, retention, fit/stability and occurrence of pain (Viola *et al*, 2012; Reissmann *et al*, 2011; Turker *et al*, 2009; Adam, 2007; Allen *et al*, 2003; Berg, 1988). Another parameter that influences levels of satisfaction is the level of experience hence the disparity in satisfaction perceived by patients treated by either junior or senior dental students (Kimoto *et al*, 2013; Wieder *et al*, 2013; Sachdeo, 2012).

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The importance of meeting patients' expectations will remain a core objective for edentulous patients and the vast amount of research in patient satisfaction and quality of life is an indication of the relevance of the topic. A study on the link between patients' expectations and satisfaction with CDs has not been done at UWC and warranted further investigation to shed light on whether the patients that are treated by undergraduate students are satisfied with the CDs they received and that their expectations were met.

Chapter 2

Aim

The aim of this study was to determine whether patients' expectations influence their satisfaction with new complete dentures constructed by undergraduate dental students.

Objectives:-

The objectives were:

1. To determine the expectations of the edentulous patients prior to receiving new CDs.
2. To determine if patient expectations are a predictor of patient satisfaction.
3. To determine if there is a correlation between socio-demographic factors (age, gender race, level of education, financial status and previous CD experience) of edentulous patients' and denture satisfaction.
4. To determine if the level of experience of undergraduate dental student influences patient satisfaction with CDs.

Null Hypothesis:

Patient's expectations do not influence their overall satisfaction with new complete dentures when constructed by undergraduate dental students.

Chapter 3

Literature Review

3.1. Edentulism

The oral health of edentulous patients has far reaching effects thus making it a key public health issue in developed countries (Govender *et al*, 2014; Petersen, 2010; Thorpe, 2006). However, in developing countries, oral health of edentulous patients is severely impacted by lack of resources, difficulty in accessing facilities and because low priority is given to oral health programmes (Petersen, 2010). The World Health Organisation (WHO) Oral Health Programme is being optimistic when they made oral health for older people a priority, hoping for a change in the approach to the rate of edentulism (Petersen, 2008).

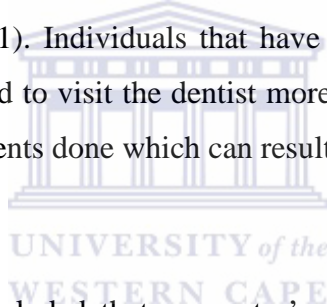
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3.1.1 Factors that influence Edentulism

Studies have shown that in developed countries a growing number of individuals retain their natural dentition into old age which has resulted in a decrease in edentulism over the past 20 years (Cooper, 2009; Felton, 2009; Van Wyk *et al*, 2004). The longevity of the population coupled with increase in sugar intake as well as a modernised lifestyle all contribute to the prevalence of edentulism in developed countries (Cooper, 2009). In these countries the treatment of choice for edentulism is implant-supported dentures and this decreases the request for CDs. The prevalence of complete edentulism in developing countries such as South Africa is still increasing and CDs are the most cost effective treatment option (Cooper, 2009; Friedling *et al*, 2007; Thorpe, 2006; Naidoo *et al*, 2001; Reisine, 2001; Douglass *et al*, 2000). In the study conducted by Naidoo *et al*, (2001) it is stated that the burden of oral diseases can be prevented and controlled with

proven interventions however patients seek treatment for pain and hardly ever for prevention. This opinion is echoed by other oral health researchers and strongly motivates for a change in the Oral Health sector (Petersen *et al*, 2010; Thorpe, 2003; Reisine, 2001).

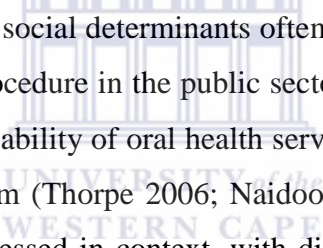
The epidemiological studies of edentulism found that factors such as gender, education, lifestyle, oral health knowledge, access to dental care, dentist-patient ratio and fluoridated water played a pivotal role in the understanding of prevalence and distribution of edentulism (Emami *et al*, 2013; Polzer *et al*, 2010; Divaris *et al*, 2010; Cooper, 2009; Butani *et al*, 2008). There is a higher incidence of edentulism in females in poorer communities, and more so in urban than rural areas and they are more likely to seek treatment for oral disease (Emami *et al*, 2013; Naidoo *et al*, 2001). Individuals that have higher levels of education and oral health education tend to visit the dentist more often and are more inclined to have preventative treatments done which can result in a decrease in tooth loss.



Polzer *et al*, (2010) concluded that a country's socio-economic status, cultural beliefs and psychosocial factors play an important role in determining the rate of edentulism. A key determinant in the oral health status of an individual is their socio- economic status. This is evident in cases where the individual of a higher socio-economic bracket will use a medical aid for treatment administered by a dental practitioner. Communities of lower socio-economic status and disadvantaged individuals mostly rely on public oral health clinics for dental treatment (Govender *et al*, 2014; Reisine *et al*, 2001). Limited access to dentists as a result of poverty and accessibility to clinics in the communities are factors that cause poor oral health status.

Poverty in South Africa is perhaps the most important factor that decisively affects health and ailing health. Individuals of lower socio-economic class are more likely to have an extraction done than any curative treatment due to the

severity of the disease. The influence of racial profiling should not be disregarded, since it is the result of this racial segregation that a disparity exists in the social determinants of tooth loss (Gilbert *et al*, 2003). Another social determinant of tooth loss is the cigarette and pipe-smoking which is rife in lower socio-economic communities (Albandar *et al*, 2000). The role of practitioners is greatly influenced by the cultural environment and often does not take into account how clinical decisions are influenced by these social determinants (MacEntee, 2010). A limitation in studies that investigate the influence of socio-economic status is recorded as the manner in which this is measured. The variables that are normally assessed are age, gender, education and income. It should be noted that something as simple as correct brushing of teeth is a behaviour that can also affect the influence socio-economic status has on oral health (Reisine, 2001).



As previously mentioned social determinants often results in extractions being the most frequent clinical procedure in the public sector (Naidoo *et al*, 2001; Jones *et al*, 2003). Access or availability of oral health services is an important contributor to this trend of edentulism (Thorpe 2006; Naidoo *et al*, 2001). Each community and region should be assessed in context, with different regions in South Africa requiring diverse interventions. In the study by Van Wyk *et al*, 2004, the South African population was divided by ethnicity and in so doing it showed a difference in the prevalence of edentulism amongst, for example, the ‘coloured’ population in the Western Cape. The lack of oral health awareness, use of fluoridated toothpaste paired with limited access to dentists could not explain the incidence of edentulism in the ‘coloured’ community. However in the study by Friedling *et al*, (2007) a strong link was found between the socio-economic status of inhabitants of Western Cape. The transition into adulthood, gangsterism, peer-pressure, fashion is the possible reasons for an increase in tooth loss. The acquisition of dentures in poor communities was seen as a status symbol and this often lead to requests for extraction of healthy teeth (Friedling *et al*, 2007).

According to Thorpe (2006), poverty and under development in Africa exposes the inhabitants to environmental determinants of oral disease. The population in Africa and sub-Saharan Africa is classified as poor with 80% of the continent falling in the low socio-economic category. Thorpe (2006), surmised that previous oral health interventions on the African continent was based on developed countries and did not taken into account the epidemiological priorities of the region and was thus unsuccessful in identifying suitable and consistent plans of action.

All the problems identified by Thorpe, (2006), are:-

1. Lack of national oral health policies and plans,
2. Inappropriately trained dentists,
3. Services that benefit only affluent and urban communities,
4. Services that is almost entirely curative,
5. Lack of equipment and materials, supplies and maintenance.

These findings (above) by Thorpe (2006) do not apply in totality to South Africa, but there are some that would equally refer to the situation here. The lack of emphasis being placed on oral health care in addition to a lack in preventative services is characteristically the challenges faced by the South African population. Moreover, the dental education programme in South Africa is accredited by a council that ensures the adherence to the highest ethical and professional best practice.

3.1.2 Effects of edentulism

Whilst edentulism is not life threatening, it has tremendous impact on the functional and social aspects of the individual's life, thus great emphasis should be placed on understanding this phenomenon. There is a strong correlation between the state of complete edentulism and the general health of patients (Emami *et al*, 2013; Polzer *et al*, 2010). In addition to the impact on *general health* there are specific *nutritional, oral health and functional* changes that are

noted in complete edentulous patients. Factors relating to the patient such as lifestyle, gender, age, diet, socio-economic status and levels of education may influence the severity of edentulism (Divaris *et al*, 2010; Petersen *et al*, 2010).

i. Impact of edentulism on general health

Having an effective functioning masticatory system is essential for any individual to maintain optimal health (Felton, 2009). The link between edentulism and poor general health is tenuous even though there is growing evidence that supports this negative relationship (Emami *et al*, 2013). Loss of natural teeth can result in limited food intake, with patients not meeting their dietary requirements and negatively influencing their nutritional state. However, the increase in the ageing population can greatly influence this trend of events. With aging, the increase in chronic systemic diseases is more prevalent and this would influence the state of nutritional health rather than the state of edentulism (Emami *et al*, 2013).



In a study conducted by Emami *et al*, (2013) the impacts of edentulism on general health were listed as follows:-

- Increased risk of cardiovascular diseases and gastrointestinal disorders due to reduced intake of fruits, vegetables, fibre and carotene.
- Increased incidence of chronic inflammatory changes of gastric mucosa, upper gastrointestinal and pancreatic cancer, and higher rates of peptic or duodenal ulcers.
- Increased risk of non-insulin dependent diabetes mellitus.
- Increased risk of electrocardiographic abnormalities, hypertension, heart failure, ischemic heart disease, stroke, aortic valve sclerosis and an increase in coronary heart disease.
- Decreased daily function, physical activity and physical domains of health related quality of life.
- Increased risk in chronic kidney disease.

- An association between edentulism and sleep disorder breathing, including obstructive sleep apnoea.

The role social isolation and depression plays in patients' general health as well as in the decision to remove teeth can greatly influence general health. Some patients may have an increase incidence of psychological, social problems and an increase in self-depreciation as a result of their edentulous state (Miranda *et al*, 2014, Smith *et al*, 2009).

ii. Impact of edentulism on nutrition

As discussed previously the nutritional impact from edentulism can be seen in the modified food choices and how it negatively influences diet and food selection for CD wearers due to their dental status (Deniz *et al*, 2013; Jones *et al*, 2003). Polzer *et al*, (2010) deduced from their research that CD wearers have a significantly lower intake of protein, calcium, iron, niacin and vitamin C. This can be explained by the reduced ability to bite, chew and swallow (Emami *et al*, 2013; Polzer *et al*, 2010).

Studies have shown that there is a decline in the enjoyment of food and the possibility of avoiding certain foods in edentulous individuals (Reissmann *et al*, 2011; Polzer *et al*, 2010). This could result in the edentulous individuals not meeting dietary requirements as a result of their sub-optimal diet and in conjunction with socio-economic status, thus negatively influencing general health. Weight gain is a result of this altered diet; however edentulous patients that do not have any dental intervention can become emaciated. Inevitably the high carbohydrate and highly processed diet results in an increase in non-communicable diseases.

CDs wearers use seven times more chewing force than dentate individuals for effective mastication and this coupled with the reduction in masseter muscle size

can greatly influence food choices (Emami *et al*, 2013). Malnutrition as a result of reduced chewing efficiency, a changed diet and nutrient ingestion may also contribute to the increased mortality in edentulous individuals (Emami *et al*, 2013; Polzer *et al*, 2010; Felton, 2009). As previously discussed the socio-economic status of an individual has far reaching effects. As regards the food choices that edentulous individual make, these are influenced by poverty and this fact cannot be ignored when assessing the nutritional status of CDs wearers.

iii. Oral functional impact of edentulism

Oral functional changes emphasise the impact edentulism has on oral health including modification of normal physiology and impaired mastication (Boucher 2004). Following the loss of teeth the alveolar bone starts remodelling (Zarb *et al*, 2004). This continual reduction of alveolar bone is more pronounced in the mandible than the maxilla (Cooper, 2009). The alveolar ridge loses vertical height and the size of denture bearing area is reduced as a result of the loss of a significant amount of alveolar bone. This is progressive and bone loss atrophy can take place up to 10 years post extraction (Zarb *et al*, 2004; Carlsson *et al*, 1997). This reduction of alveolar bone affects the facial appearance and the vertical dimensions of the edentulous patient. In addition, the loss of alveolar bone height and width causes soft tissue changes resulting in the protrusion of the lip and chin in the mandible (Emami *et al*, 2013; McGarry *et al*, 1999).

Residual ridge resorption occurs throughout the lifetime of the edentulous patient and results in bone remodelling due to the altered functional stimulus on the jaw bone (Zarb *et al*, 2004; Ivanhoe *et al*, 2002). The dramatic loss of bone in mandible often results in the difficulty patients experience to adapting to the lower denture (Cooper, 2009). Factors that can influence the rate in which residual bone resorbs vary and these range from gender, age, duration of edentulousness, number of dentures worn, para-functional habits, occlusal loading, denture quality and general health (Brunello *et al*, 1998). The degree of residual ridge resorption

is strongly linked to the duration of edentulism (Polzer *et al*, 2010). Interestingly, females are more likely to exhibit an increase in residual ridge resorption (Divaris *et al*, 2010). In cases with severely resorbed ridges pre-prosthetic surgery is a procedure that can be considered to improve the denture bearing capacity (Carlsson, 2009).

3.2. Expectation

Expectation can be defined as a feeling of hope, being in a state of expecting, anticipation with confidence of fulfilment, and in some cases apprehension (Oxford English Dictionary, British & World version 2013). All these emotions can be experienced by the prosthetic patient and in some cases it is the comparison to their existing CDs that greatly influences their expectations (Miranda *et al*, 2014; Marchlioglou *et al*, 2010). Many factors play an integral part in the psyche of the patient and the understanding of these factors which impacts on the effective management of the patient, is important (Zou *et al*, 2015; Cooper, 2009; McGarry *et al*, 2009). It is therefore significant when starting any treatment to build on to the dentist-patient relationship in order to gain a deeper understanding of the patient (Yamalick, 2005).

Pre-treatment expectations have the ability to affect the success of treatment outcomes and, failures can result from the misinterpretation of these perceptions and expectations of the patient. However, compromises with regards to treatment outcomes will easily be accepted by patients when they have been included in the diagnosis and decision-making. This approach cannot be over-emphasized as it would definitely improve patient satisfaction (Marchlioglou *et al*, 2010; de Souza e Silva *et al*, 2009; Ivanhoe *et al*, 2002).

Edentulism negatively affects self-image and self-esteem (Divaris *et al*, 2012; Felton, 2009). A major contributor for seeking treatment for edentulism is re-integration into society, seeking employment and to communicate with ease (Al

Mendilawi *et al*, 2006; Jones *et al*, 2003). Several studies have been conducted to gain insight into what contributes to the expectations patients have regarding CDs (Miranda *et al*, 2014; Gasper *et al*, 2013; Al Mendilawi *et al*, 2006; Smith *et al*, 2004; Fromentin *et al*, 2000).

Miranda *et al*, (2014) conducted a study on the premise that expectations are developed from past experiences and are influenced by patients' existing knowledge related to treatment. Perceptions are the manner in which patients understand the procedures or treatment and this greatly influences their expectations. This study found that perceptions regarding new CDs were not influenced by education or previous denture experience. This contrasts with the results from the study conducted by Leles *et al*, (2008) that investigated the influence of clinical variables on patients' perception. These expectations vary in individuals and can be influenced by age, gender, levels of education. One of the expectations is the need for the dentures to be like natural teeth and this often results in disappointment, since CDs cannot fulfil the loss of natural teeth (Gasper *et al*, 2013; Karydis *et al*, 2001; Davis *et al*, 1986).

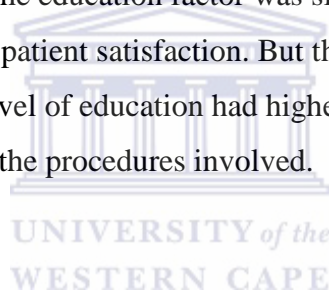
The following studies stated that patients can have expectations that relate to the new CDs being constructed by the dentist /student, and of the treatment they received (Mirander *et al*, 2014; Gaspar *et al*, 2013; Suresh *et al*, 2010; Felton, 2009; Smith *et al*, 2004):

1. These expectations linked specifically to the CDs are aesthetics, comfort, speech and mastication and past experiences with CDs. In a study conducted by Suresh *et al*, (2010), the expectation by edentulous males are more focused on wanting dentures for masticatory purposes while females placed more emphasis on dentures for aesthetic purposes. Miranda *et al*, (2014) found similar results regarding females having greater expectations for aesthetics and having greater health concerns than males. The patients' socio-cultural and economic variables

have an impact on patients' attitude towards treatment and should be noted during the examination stage.

2. The expectations related to the operator (dentist/student) and to the treatments received are: experience of the dentist or dental student; whether the treatment offered is in a teaching institution or at an established practice and if precautions were taken to prevent cross infections (Karydis *et al*, 2001; Douglass *et al*, 2000).

Gaspar *et al*, (2013) concluded that expectations exceeded the satisfaction score in a study on the correlation of previous denture experience, expectations and post-delivery adjustments of CDs. Previous denture experience could slightly influence satisfaction and this can be because of the developed neuromuscular control from wearing previous CDs. The education factor was significant; therefore expectation had a slight influence on patient satisfaction. But the authors argued that individuals with lower level of education had higher expectations mainly due to a lack of understanding of the procedures involved.



Suresh *et al*, (2010) conducted a study using a validated questionnaire which had four categories namely mastication, aesthetics, phonetics and comfort. This questionnaire was completed in the form of an interview, and concluded that pre-treatment expectations contributed to treatment outcomes and could result in treatment failure if these expectations were mismatched. Once again emphasis is placed on the need to take an extensive history of the patient and to do a thorough initial clinical examination. The mistaken belief that with dentures, mastication and speech will be similar to natural teeth is influenced by the explanation and description given by the dentists (Shonwetter *et al*, 2012; Suresh *et al*, 2010; Karydis *et al*, 2001). Patients should routinely be informed about the condition of their maxillary and mandibular ridges, especially the latter since it is more challenging with regards to obtaining retention and stability of CDs (Fukai *et al*, 2012; de Souza e Silva *et al*, 2009).

Patients want CDs to be similar in form and function to natural dentition. Based on this argument Al Mendilawi *et al*, (2006) posed a questionnaire to edentulous patients to assess their expectations regarding fit, function, comfort and aesthetics. Patients exhibited high expectations regarding aesthetics and function. Patients also had high expectations regarding denture stability and fit, and this result was seen by the large percentage of first time denture wearers (Al Mendilawi *et al*, 2006). Smith and Mc Cord, (2004), stated that the expectations of edentulous patients were high regarding mastication, speech and aesthetics.

In the study by Marachioglou *et al*, (2010) questions were posed to the patient, dentist and the dental technician regarding the expectations they had for the new CDs. The results of the study were similar to the study by Gaspar *et al*, (2013) with the patient expectation exceeding that of the dentist and technician. This could be explained by the dentist making a decision based purely on the clinical presentation of the patient and not the psycho social factors involved in denture acceptance. Patient expectations were not influenced by gender and age but rather by their previous CD experiences (Marachioglou *et al*, 2010). When making dentures for patients, their clinical and psychological makeup should be given due consideration as it impacts on the steps in making these CDs for them. The treatment plan should be detailed to suite their specific individual needs, emphasising the limitations identified for each specific patient (Fromentin *et al*, 2000). The use of visual aids and pre-treatment discussions serve as a good source of information for the patient, but it does not necessarily influence the patient's expectation or satisfaction (Marachioglou *et al*, 2010; de Souza e Silva *et al*, 2009).

From a different perspective, Shonwetter *et al*, (2012), also identified some softer skill requirements of the operator that influences patient expectations. These include: sharing of information, tending to the patients' comfort, being caring and respectful, interacting with team members and professionalism. In a study by

Karydis *et al*, (2001), the general expectations patients have regarding dental health care was investigated by using questionnaires. Four dimensions were assessed namely assurance, empathy, reliability and responsiveness. The results of this study showed that patients had high expectations regarding empathy and the manner in which the dentist interacted with them. This was followed by assurance of a safe environment where the dentist adheres to rules of infection control. The third significant outcome was the responsiveness of the practitioner and willingness to work. The qualification of the practitioner which is covered by the reliability dimension had the lowest expectation score (Karydis *et al*, 2001).

The Patient Denture Expectation Questionnaire (P-DEQ), a validated questionnaire formulated by Smith *et al*, (2004) was used in a study to determine patient expectations of CDs. They focused on the five clinical features related to the success of CDs as stipulated in standard prosthodontic textbooks (Zarb *et al*, 2004). These included the assessment of pain, ease of chewing, looseness, appearance and the effects dentures have on speech (Smith *et al*, 2004). Other factors, related to denture expectation that were assessed in the study by Smith *et al*, (2004) included: CDs stability, retention, comfort, pain, taste and ease of denture cleaning. Selection of teeth and oral care were identified as areas that needed more attention (Smith *et al*, 2004).

In addition to patient expectations, the participants in the study by Smith *et al*, (2004) were also asked questions relating to requirements for information regarding denture construction. The study found that patients attending a teaching dental clinic affiliated to a hospital usually had less of a need for further information regarding denture construction in comparison to patients attending a private practice (Smith *et al*, 2004; Fromentin *et al*, 2001). The teaching environment is an opportunity for patients to actively participate in their treatment and question the stages that they are uncertain or unfamiliar with (Smith *et al*, 2004). The importance of developing a mutually satisfying relationship between

dental student/dentist and patient is well documented and has been scrutinized in the literature (Al Mendilawi *et al*, 2006; Douglass *et al*, 2000).

In a study by Zou *et al*, 2015 the same questionnaire was used before and after treatment to assess expectations and satisfaction. Higher levels of expectations were recorded than satisfaction when assessing phonetics, chewing, comfort and aesthetics and no statistical correlation was found between expectations and satisfaction. These expectations were not influenced by gender and previous denture experiences which are similar to previously mentioned studies.

3.3. Satisfaction

Successful prosthodontic treatment entails a pain-free, retentive, supportive prosthesis that fulfils the aesthetic, function and speech requirements of the patient (Viola *et al*, 2013; Reissmann *et al*, 2011; Critchlow *et al*, 2010; Adam *et al*, 2007; Allen *et al*, 2003; Roessler, 2003; Douglass *et al*, 2002; McGrath *et al*, 2001) In order to achieve this an undertaking by the dentist to assess expectations, good theoretical knowledge and clinical expertise is required. The understanding of patient expectation relies on the ability of the dentist to establish in advance what can realistically be achieved and to identify whether or not these expectations can be met by constructing CDs (Douglass *et al*, 2002). It is therefore imperative to set objectives and goals that the patient is made aware of. In addition to this the dentist should have an understanding of cultural diversity and the influences both religion and cultures may have on the patients' opinions on health care (Butani *et al*, 2008).

Satisfaction is defined as fulfilment of one's wishes, expectations or needs. (Oxford English Dictionary, British & World version 2013). The connection between expectation and succeeding satisfaction is by definition the fulfilment of that anticipation. The link between satisfaction with new CDs and quality of life

has been investigated previously at UWC (Adam *et al*, 2007). The researcher concluded that the provision of new CDs indicated a significant improvement in the quality of life of edentulous patients (Adam *et al*, 2007). This follows other studies that show how edentulous patients wanting to improve their quality of life, often seek CDs as one of the methods of attaining it (Viola *et al*, 2013; Allen *et al*, 2003; McGrath *et al*, 2001). Even though the procurement of CDs is relatively small in comparison to other medical interventions, the effect that CDs have on the perception of good health and quality of life is substantial enough to warrant treatment for edentulism (Reissmann *et al*, 2011). Successful denture therapy is based on factors that relate to the dentist, dental student, the edentulous patient and the CDs.

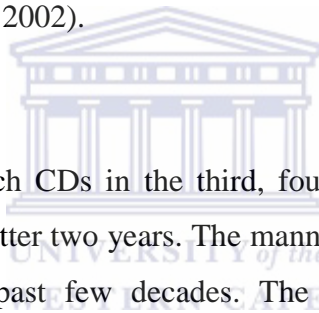
3.3.1. Factors related to dental student that influence successful denture therapy:

Prosthodontics is one of the divisions of dentistry pertaining to the restoration and maintenance of oral function, comfort, appearance, and oral health of the patient (Nitschke *et al*, 2004). This is sometimes achieved by providing the patient with removable prostheses. Undergraduate prosthetic dentistry involves the teaching and educating of dental students and developing their skill to treat an edentulous patient. The dental student should be able to apply theoretical knowledge clinically to provide the patient with stable and retentive CDs that fulfils the expectations on functional, aesthetic and emotional requirements and that leaves the patient satisfied with the end result. Edentulous patients treated by undergraduate students have varying opinions regarding the skill and professionalism of the operator and this can influence perceived satisfaction (Wieder *et al*, 2013; Sachdeo, 2012; Van Waas, 1990).

The provision of CDs will continue to be a pre-requisite of geriatric health care. There are studies that claim there is a reduction in the number of edentulous patients in developing countries like South Africa have a high percentage of ageing population and will continue to increase and so too the need for CDs. As

previously discussed, the treatment needs in SA vary in relation to first world countries, and state clinics offer referrals but complete denture services are not provided.

It is however important to note that there is more accessibility and interest in implant-retained dentures in developed countries and hence a reduction in patients available for CDs at teaching institutions. This could be one of the reasons dental schools in developed countries, has had to reduce the emphasis on the teaching of CDs (Wieder *et al*, 2013; Clark *et al*, 2010). South Africa however has a high percentage of edentulous patients and with no formal dental care plan for the elderly it will remain an important part of dental education (MacEntee, 2010). As previously discussed the treatment needs vary in South Africa in relation to first world countries and state clinics offer referrals but here no treatment is rendered (Narby *et al*, 2007; Reid, 2002).



Most dental schools teach CDs in the third, fourth and fifth year, with greater emphasis placed in the latter two years. The manner in which prosthetics is taught has changed over the past few decades. The literature refers to how most international dental schools have embraced e-learning and videos for certain stages of complete denture construction. Anecdotally it has been observed that this is happening at this institution where this study is being conducted as well (Petropoulos *et al*, 2005; Clark *et al*, 2004). The combination of practical and didactic education results in improved overall patient management (Nitschke *et al*, 2013).

Theoretical lectures, clinical teaching as well as laboratory techniques are structured so that the stages of CDs construction are easily understood by the undergraduate dental student. The laboratory component of the prosthetics course is an adjunct to the clinical theory course and one that has to be completed successfully before being allowed to do the clinical programme. Subsequently the clinical and laboratory coursework blend, thus allowing the student to complete

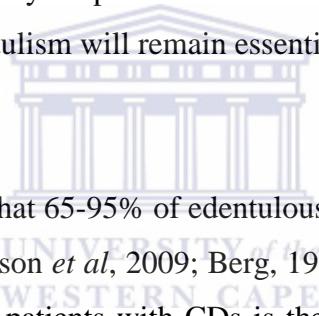
all stages of the denture-making process (Clark *et al*, 2002). The prosthetic course is extremely intense and often there is a struggle to balance clinical and technical teaching.

Another facet of the dentist-patient relationship that can influence patient satisfaction with CDs is discussed in a study conducted by Gurdal *et al*, (2000), where it was reported that patients responded positively to female dentists. Dentists and dental students tend to be influenced greatly by the clinical presentation of the patient and limit the input regarding patients' expectation and experiences to guide treatment decisions (MacEntee 2010). This could be related to the need for an established relationship between dentist and patient. This relationship allows the patient to express concerns, discuss medical history and expectations for the planned treatment. It also allows the dentist to communicate treatment, diagnosis and include the patient in the decision-making. The technical aspect of denture construction plays an instrumental part in acceptance of the denture, but recent studies show interpersonal skills like caring and pleasant dentists enhance the experience for the patient (Gurdal *et al*, 2000). Dissatisfaction of treatment received by undergraduate dental students can be influenced by technical and non-technical factors. These include waiting periods, inability to complete tasks in allocated times, lack of empathy and failure to complete bookings correctly (Sachedeo *et al*, 2012).

A challenge that faces the dental practitioners is the decline in research articles on complete denture Prosthodontics (Carlsson *et al*, 2009). The teaching of Prosthetics will continue to be a mainstay in dental education. A review conducted by Carlsson and Omar, (2009) on the future of complete dentures in oral rehabilitation concluded that:

1. A decline in prevalence and low incidence of edentulism in first world countries with reliable epidemiology data is noted, however many elderly edentulous patients need oral rehabilitation.

2. Based on the demographic data accumulated the rehabilitation of edentulous patients will remain a service requirement.
3. Whereas there are some patients that cannot adapt to dentures, CDs will remain the first treatment option for many edentulous patients in developing countries.
4. Implant-retained dentures are superior to conventional CDs, but the cost of this treatment option makes it inaccessible for most edentulous patients in the lower socio-economic groups.
5. An interest in implants has increased over the decade, but most edentulous patients are satisfied with conventional CDs, however this could be as a result of the cost factor rather than the treatment option.
6. The research and training in the field of complete denture prosthetics will continue to be very important in the future, and thus this treatment modality for edentulism will remain essential.



It is however significant that 65-95% of edentulous patients are satisfied with CDs (Bellini *et al*, 2009; Carlsson *et al*, 2009; Berg, 1988). This statistic reinforces the statement, that providing patients with CDs is the most cost effective option for oral rehabilitation. This has implications for the undergraduate dental education, specialist training and future research. Increasing the focus on Gerontology in the Prosthetic course will assist undergraduates' students to understand the management of the edentulous patient and in doing so complete the traditional topics for this course (Nitschke *et al*, 2013).

A study conducted by Gauthier *et al*, (1982), concluded that even though graduates used the skills and theoretical knowledge gained from complete denture prostodontics, they are privileged to attend courses and continuous education programmes to keep abreast with recent developments to improve their skills. In a study done by Lynch *et al*, (2007), dental education in the United Kingdom and Ireland were assessed and similarities can be drawn to the trends in South Africa

(Lynch *et al*, 2007; Petropoulos *et al*, 2005). The changes to contemporary education will best prepare today's students for clinical practice and in addition provide evidence to lever change in dental education programs at local and national levels (Aragon *et al*, 2010; Levin *et al*, 1985).

3.3.2. Factors specific to edentulous patients that influence successful denture therapy:

Factors that could influence satisfaction with CDs include (Kovac *et al*, 2012; Celebric *et al*, 2003; Van Waas, 1990):

- clinical presentation and quality of denture bearing areas,
- age of the patient,
- gender of the patient,
- previous denture experience,
- level of education,
- self-perception,
- socio-economic status,
- Patient-dentist relationship,
- patient's personality and psychosomatic profile,
- patient's ability in cleaning of CDs



i. The clinical presentation of the edentulous patient

The clinical presentation of the edentulous patient can influence the outcome of the treatment. This includes viscosity of saliva, adhesion and cohesion, resorption of alveolar ridge, quality and quantity of alveolar ridges, relationship between upper and lower alveolar ridge, neuromuscular coordination, condition of oral mucosa and resilience of soft tissue (Critchlow *et al*, 2010; Fenlon *et al*, 2008 Celebric *et al*, 2003). Clinical or anatomical features that can negatively influence the outcome of denture construction include ridge atrophy, mobility of the soft

tissues and enlarged anatomical features (Carlsson *et al*, 2009; Fenlon *et al*, 2008).

The adaptation of the patient to the denture is extremely subjective and some patients develop neuromuscular control more readily than others, regardless of the quality of the denture base or denture bearing tissue (Viola *et al*, 2013). There is a strong correlation with retention of the prosthesis and the accurate recording of jaw relation position (Carlsson *et al*, 2009). In addition to the correct recording of jaw relations the relationship between quality of residual alveolar ridges and quality of new dentures significantly influences masticatory function (Fenlon *et al*, 2008). More importantly, the adaptation of the denture to the denture bearing areas should be optimal, and this can be aided by the use of special impression techniques. Special impression techniques assist in the management of different residual ridge discrepancies such as ridge form and mobile soft tissue attachments. These changes pose challenges due to the continuous resorption of the residual ridge (Kawai *et al*, 2005; Mc Garry *et al*, 1999; Brunello *et al*, 1998).



The importance of correct diagnosis of maladaptive patients and adjusted treatment plans or options are imperative for a successful treatment outcome (Assuncao *et al*, 2010; Leles *et al*, 2008; Kawai *et al*, 2005). In instances where patients have a history of unsuccessful treatment and the inability to adapt to dentures, the option of implant-retained dentures should be discussed (Assuncao *et al*, 2009; Stern *et al*, 2000).

ii. The age of the edentulous patient

Studies have shown younger patients gave higher ratings of satisfaction when assessing retention in the maxillary denture, whereas older patients had that perception with the mandibular denture (Alfadda *et al*, 2015; Bilhan *et al*, 2013). Previous denture experience had similar ratings. In the case of mandibular denture

retention, the older more experienced denture wearers had a high rated level of satisfaction than the younger counterparts, even though the younger denture wearers may present with better residual ridge quality. This could be the result of the length of adaptation that is required for neuromuscular adaptation which is required for the muscles related to the tongue, lips and cheek to adapt to the flanges of the lower denture. The longer the patient wears the dentures, the greater the neuromuscular control and the greater the satisfaction with the denture. The complaints are often about the new mandibular rather than maxillary dentures (Turker *et al*, 2009; Fenlon *et al*, 2004; Celebric *et al*, 2003; Van Waas, 1990). This conflicting attitude regarding mandibular denture satisfaction could be related to anatomical structures, denture quality or patient acceptance. Incorrect denture extensions as a result of incorrect impression techniques and the amount of residual ridge resorption are all influencing factors. Patient neuroticism is another contributing factor. Older patients tend to be more psychologically stable and have less stress related to social activities than their younger counterparts. This could result in dissatisfaction of the denture regardless of above-mentioned factors (Al Omiri *et al*, 2010).



iii. Education

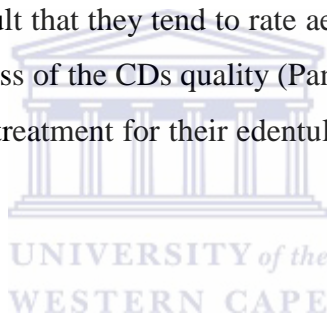
Levels of education and higher economic status had noticeably different effects on satisfaction. Patients with a higher level of education and higher economic status were less satisfied with speech, aesthetics, retention and cleaning of CDs (Kovac *et al*, 2012; Turker *et al*, 2009; Celebric *et al*, 2003).

iv. Gender

While edentulism affects both male and female, a larger percentage of edentulous patients are females (Leles *et al*, 2011). Edentulous females' rate ability to function, speak and aesthetics lower than their male counter parts (Turker *et al*, 2009). The study by Celebric *et al* (2003) concluded that gender had no significant

influence on denture satisfaction; however Pan *et al*, (2008) identified distinct differences in pain perception, aesthetics and masticatory function. This can be explained by females reporting pain more readily and having physical differences that differentiate their experiences with CDs from males. These differences range from hormonal, blood pressure, osteoporosis and the ability to discern changes to the oral cavity that are not obvious (Pan *et al*, 2008). A greater level of dissatisfaction with the mandibular denture after habituation is often reported and a lower rating of chewing ability as a result of being more sensitive to change in the oral cavity.

Another important factor is the psychological impact edentulism has on females. The loss of aesthetics, speech, and masticatory function impacts the individual's identity (Pan *et al*, 2008). Females tend to be less satisfied with their appearances and this supports the result that they tend to rate aesthetics lower in the evaluation of their dentures regardless of the CDs quality (Pan *et al*, 2008). Edentulous males are less inclined to seek treatment for their edentulism (Zou *et al*, 2015; Pan *et al*, 2008).



v. Self-perception and self-image

Quality of life and self-perception of a better quality of life also influence satisfaction with dentures (Celebric *et al*, 2003). Patients that perceive their quality of life in a positive manner have higher levels of satisfaction with masticatory function and aesthetics (Van Waas *et al*, 1990; Vallittu *et al*, 1996). Self-image and dental aesthetics requirements can influence the outcome of treatment. The selection of prosthetic teeth is related to numerous measurable factors. These include gender, age, shape of the face and the shape of the edentulous arch (Vallittu *et al*, 1996).

Male edentulous patients prefer square teeth whereas females prefer ovoid shaped teeth (Tin-Oo *et al*, 2011). The colour of the dentition is polychromatic and not

monochromatic and teeth darken significantly with age, with a gradation of shades and colour (Vallittu *et al*, 1996). The study by Valittu *et al*, (1996), found that with age the perception that ‘very white teeth are beautiful’ decreases though younger patients would prefer whiter teeth than their older counterparts. The notion that very white teeth are the most beautiful is associated with levels of education (Sato *et al*, 2000). Patients with low levels of education have a greater preference for white teeth than the ones that are more educated (Kovac *et al*, 2012). Most patients express satisfaction with aesthetics and ability of speech. This could be attributed to the acceptable arrangement of denture teeth and their appearance during speech and masticatory function (Sato *et al*, 2000).

In addition to these factors that influence the complexity of patient satisfaction in an academic environment, variables such as long waiting periods, treatment that is not properly planned, cost of treatment and knowledge of the dental student have the capacity to affect outcome of treatment received. Another integral factor in satisfaction with dentures is the patient’s attitude prior to receiving CDs, because existing negatively based opinions often results in unsatisfied patients and vice versa for the positive patients (Brunello *et al*, 1998).

vi. Psychosomatic factor

The *psychosomatic* phenomenon which is the combination of expectation, emotional factors and psychosocial factors play a pivotal role in the patient’s adaptation to his or her CDs. (Janowski *et al*, 2013; Al Omiri *et al*, 2010; Lee *et al*, 2008). Locus of control (LOC) is a theory in personality psychology which refers to the extent individuals believe that they can control events that causes positive or negative results in their lives (Marks, 1998). It is a measure of non-cognitive skills embedded in psychological literature. Due to the role the psyche of the patient inevitably plays in perception and levels of self-worth, it is necessary to explore the theory of locus control to complete this discussion (Kasilingam *et al*, 2010).

Rotter's theory on LOC is divided into Internal and External sources (Kasilingam *et al*, 2010; Rotter, 1990). The development of LOC originates from past experiences, family and culture (Kasilingam *et al*, 2010). The two types of LOC refer to the way the individual evaluates their responsibility for the events in their lives:

Internal Locus of control

Patients with an internal LOC see the events of their life primarily as a result of their own actions and behaviour. These individuals have better control of their behaviour, actively seeking knowledge concerning their situation and usually have great belief in their success (Kasilingam *et al*, 2010). People with an internal LOC believe in controlling their destiny and relying on their personal skills and efforts (Marks, 1998). Literature shows that these individuals with an internal LOC form part of families that place emphasis on education, responsibility and effort (Kasilingam *et al*, 2010).

External Locus of control

Patients with an external LOC see the same events of their life as circumstances out of their control. These individuals believe that fate, chance, luck or the influence of others are determining factors in their lives. People with an external LOC usually do not have high levels of expectations and lack persistence (Marks, 1998; Kasilingam *et al*, 2010). In comparison to patients with an internal LOC, those with external LOC come from low socio-economic backgrounds and situations where there is little or no control of how their lives turn out (Kasilingam *et al*, 2010).

According to Lee *et al*, (2008) there is a relationship between internal or external LOC and patient adjustment. Patients with an external LOC tend to be more

maladjusted than those in the internal groups. In the study Lee *et al*, (2008) used the Locus of Control scale which has proven to be a useful tool in the prediction of human behaviour. The study concluded that patients with internal LOC adapt faster and tend to cooperate with a treatment plan, and are vocal about complaints and dissatisfaction (Lee *et al*, 2008).

Auerbach *et al*, (2004) conducted a study to evaluate the effects of giving patients treatment options that are relevant and that may or may not influence dental treatment. Certain patients were given control regarding treatment outcomes and decision-making while others were not. The expectation of the study was that patients with an internal LOC would respond positively to being given autonomy in their treatment objectives and decision-making, while external LOC patients who theoretically have lower expectations would do better in the low control conditions. In addition to this objective the studies also evaluated inter personal relationship between patient, dental student and dentist. Inter personal relationship between patient and dentist once again played a pivotal role in satisfaction and agreement of treatment objectives in this study (Auerbach *et al*, 2004).



In a study conducted by Bellini *et al*, (2009) in which the effect of the type of LOC a patient exhibits and its influences on expectations as well as satisfaction was established. These different profiles are verified using a validated questionnaire that contains questions regarding patient beliefs about the control of their lives (Bellini *et al*, 2009). What was evident was that, patients with an external LOC would tend to blame the denture and the dentist for the dissatisfaction and would most likely request unnecessary adjustments.

The study conducted by Al Quran *et al*, (2001) supports these theories that patients with many complaints often have associated emotional problems. These patients are characteristically emotionally less stable, apprehensive and are more difficult to satisfy. It is however important to note that criticism regarding the validity and reliability of these psychological tests have been noted, but the

valuable contribution in patient management should not be disregarded (Zou *et al*, 2015; Al Quran *et al*, 2001). The correlation between psychological aspects and satisfaction with complete dentures has been assessed and a link between dissatisfied patients with characteristics such as pessimism, neurosis and egocentricity has been established. The complaints of the unsatisfied patient range from looseness, pain, poor masticatory function and aesthetics (Janowski *et al*, 2013; Bellini *et al*, 2009).

Another noteworthy result in the study by Bellini *et al*, (2009) was the high levels of expectations prior to treatment as well as satisfaction with the new CDs. This contradicts the findings in the study by Fomentin *et al*, (2001) that had a greater level of expectation in comparison to satisfaction post-denture therapy. It is important to note that, dentist-patient relationship could have influenced these differences if the expectation of the patient were not in an acceptable range according to literature (Karydis *et al*, 2001).

The studies on LOC with edentulous patients has shown that individuals with an external LOC tend to be dissatisfied with CDs regardless of the standard of treatment they received or the quality of the CDs. Neuroticism which includes depression, anxiety, hostility, self-consciousness, anger are personality dimensions that can be associated with patient dissatisfaction. This link between neuroticism and patient satisfaction is the basis of the relationship between satisfaction and patient personality profiles. The opposite is evident in patients with an internal LOC where denture satisfaction is achieved with the CDs regardless of the quality of the denture and the clinical experience of the dentist. Evaluation of patients personality profiles can aid in the manner treatment is decided upon and discussed in Dentistry (Al Omiri *et al*, 2010).

3.3.3. Factors related to CDs

i. Influence of occlusion on satisfaction in complete dentures

Mastication can be described as coordinated neuromuscular function involving efficient jaw movements with constant changes of force (Deniz *et al*, 2012). The ability to chew food and the enjoyment derived from it plays a vital role in the quality of life of edentulous patients (Abduo, 2013; Ribeiro *et al*, 2012; De Lucena *et al*, 2010; Boretti *et al*, 1995). Masticatory function decreases with the increase in the number of teeth lost (Hatch *et al*, 2001). In comparison with a dentate person an edentulous patient with complete dentures is approximately 10-20 % as efficient (Deniz *et al*, 2012; De Lucena *et al*, 2010; Veyrune *et al*, 2005). Age and dental status has an effect on masticatory ability (Hatch *et al*, 2001).

The factors that influence masticatory function are support, retention, height and shape of the residual alveolar ridge, salivary secretion, tongue motor skills and occlusion (Abduo, 2013; Deniz *et al*, 2012). Masticatory function is measured in edentulous patients with the use of electromyography (EMG) (De Lucena *et al*, 2010; Veyrune *et al*, 2005). EMG is a specialised technique used to measure activity of individual muscles and allows interpretation of the motor control system (Deniz *et al*, 2012; Veyrune *et al*, 2005).

Denture occlusion is critical in the construction of complete dentures. Aesthetics is determined by the occlusal scheme chosen, thus it influences the acceptance and satisfaction with CDs (Abduo, 2013). CD teeth exhibit different biomechanical characteristics than natural teeth (Ribeiro *et al*, 2012; De Lucena *et al*, 2011; Veyrune *et al*, 2005, Boretti *et al*, 1995). To assist in the management of this instability various occlusal schemes with a change in the posterior tooth morphology is used to minimise the forces on the residual ridge. The occlusal scheme chosen will assist in the stability and retention of the denture. Two popular schemes that are used in the construction of complete dentures are: balanced occlusion and lingualised occlusion (De Lucena *et al*, 2011; Phoenix *et al*, 2010).

ii. Denture Quality

Denture quality is defined in relation to a number of factors, such as retention, stability, fit, vertical dimension, occlusion, arrangement of teeth and aesthetics (Akeel, 2009; Fenlon *et al*, 2002). The quality of the denture-bearing tissue on the perception of denture quality is often not assessed collectively and studies have shown conflicting results regarding the influence denture quality have on masticatory efficiency (Akeel, 2009). In the study by Akeel (2009) patients completed a denture satisfaction questionnaire at the recall visit and this data was compared to the evaluation of the denture by an examiner. The new CDs were assessed in terms of extensions, aesthetics, occlusion, function, stability and retention. The researcher concluded that patients were satisfied regardless of the quality of the CDs. This result is contradicted by a similar study conducted by Alfadda *et al*, (2015) that found the CDs quality greatly influences the level of satisfaction of the edentulous patient. This could be explained by the clinical presentation of the patient. The stability of both the maxillary and mandibular denture is viewed as a denture quality parameter that greatly influences patient satisfaction.

The criteria used to assess denture quality were established by Sato *et al*, (1998). A quantitative clinical examination of CDs was constructed where these seven factors were evaluated: Anterior teeth arrangement; inter-occlusal distance; occlusion; articulation; retention, stability and border extension of the mandibular denture (Alfadda *et al*, 2015; Akeel, 2009; Sato *et al*, 1998). This development has clarified how each clinical factor contributes to the general assessment of the CDs. It makes the evaluation less subjective by using a quantitative method of CDs assessment.

Another method that can be used to examine dentures is the Woelfel's method (Corrigan *et al*, 2002). The denture is evaluated according to the following criteria: retention, stability and correspondence of the retruded jaw relationship with position of maximum intercuspation (Ribeiro *et al*, 2012; De Lucena *et al*, 2011; Fenlon *et al*, 2002; Corrigan, 2002). Fenlon *et al*, (2004) used the Woelfel's method in a study to investigate denture quality of new CDs after two years of wear. The Woelfel's method is used to grade dentures on their retention and stability and for the accuracy of the reproduction of the jaw relationship (Fenlon *et al*, 2004). This was done by means of questionnaires completed post-insertion, 3 months later and then finally 2 years later. The study concluded that the quality of the CDs at insertion was significant in determining patients' satisfaction with new CDs within the first 3 months. There were distinct changes in satisfaction with the maxillary and mandibular denture of the two-year period. Great improvements in comfort and chewing ability of the mandibular denture were noted whereas satisfaction declines in relation to the maxillary denture (Fenlon *et al*, 2004). This change in perceived satisfaction could be related to length of time it requires for the edentulous patient to attain neuromuscular control after use of the mandibular denture.

Several studies have failed to show strong correlations between either patient satisfaction with their dentures and their quality or denture satisfaction and the quality of the denture supporting tissues (Ribeiro *et al*, 2012; Anastassiadou *et al*, 2006; Narain *et al*, 2010; De Baat *et al*, 1997). The disparity could be caused by oral factors that may lead to prosthesis incompatibility, for example, mechanical, thermal, biological, chemical or allergic irritations of the oral mucosa (De Baat *et al*, 1997; Sato *et al*, 1994).

In addition to this, the opinion of the dentist and the patient varies when it comes to successful denture treatment. Patient satisfaction with CDs does not mean that the denture fulfils all the necessary requirements for a technically satisfactory

denture. The technical requirements that the patients are usually asked to assess include aesthetics, masticatory function, speech, ability to taste food and comfort (Ribeiro *et al*, 2012; Anastassiadou *et al*, 2006).

In the study by De Lucena *et al*, (2011), it was found that efficient mastication is not based on the effective mastication but rather on comfort and stability. While some concluded that technically inadequate CDs have an effect on diet and mastication, others have shown that some patients were satisfied with inadequate dentures (Alfadda *et al*, 2014). This could be as a result of better adaptation and acceptance of the individual. The patient's final judgement of the denture quality is greatly influenced by expectations, number of previous dentures and the dentist-patient relationship. This phenomenon of acceptance once again supports the theory that acceptance and satisfaction of dentures cannot be predicted and the quality thereof plays a role in some cases and not in others. However in the study by Fenlon *et al*, (2002), it was concluded that patients are able to discriminate between dentures of different qualities and a positive association exists between patient assessment of dentures and the quality of dentures. On the other hand some patients that cannot accept foreign object in the oral cavity and will not accept dentures that are rated as technically satisfactory.

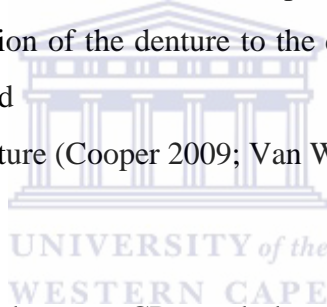
There is an association between the skills of the dentist or dental student during the construction of CDs and its clinical quality requirements. Akeel (2009), concluded that dentures constructed by junior dental students were less satisfactory with regard to quality in relation to CDs fabricated by senior students and qualified dentists (Akeel, 2009). The author also makes reference to the most common causes of poor quality CDs to poor aesthetics, over- or under-extended denture bases, inadequate peripheral seal, presence of occlusal interference and inadequate adaptation and retention, improper stability and the damage to oral structures (Akeel, 2009).

The functional assessment of dentures (FAD) tool was developed to aid in routine diagnosis investigating the relationship between denture qualities and the functional outcome of the new prosthesis. This tool assessed freeway space, occlusion, upper retention (resistance), tongue control, upper stability and lower stability (Anastassiadou *et al*, 2006; Corrigan *et al*, 2002).

3.4. Dissatisfaction with CDs

The most common reasons for dissatisfaction in CD wearers are:

- unsatisfactory retention and stability of the lower denture,
- occlusal factors,
- dissimilarities between the new and the previous dentures,
- incorrect adaptation of the denture to the denture bearing areas including peripheral seal and
- quality of the denture (Cooper 2009; Van Waas 1990)



Dissimilarities between the new CDs and the previous set can lead to great disappointment and often adaptation is a slow process. This mal-adaptation can be the result of a change in occlusal scheme, anterior-posterior arch shape, and drastic vertical dimension modifications. The other possible causes are inappropriate occlusal loading resulting in trauma to denture bearing tissues (Lewis, 2000). Once again, the relationship between an unrealistic expectation and dissatisfaction with dentures should be taken into account. This reinforces the importance of a detailed, concise history and initial examination. The need for a clinical quality assurance is important, which will allow both laboratory and clinical staff to adhere to strict standards (Laurina *et al*, 2006; Lewis, 2000).

Critchlow and Ellis (2010) performed a literature review on the prognostic indicators for conventional CD and concluded:

1. There is a weak correlation between acceptances of well-constructed and poorly constructed CDs.
2. Patients with a history of neuroticism are not likely to adapt to CDs.
3. A minority of patients will not adapt to any CDs irrespective of the quality thereof.
4. Prognostic indicators for conventional CD construction such as: age, demographics, previous denture experience, method of construction has weak correlations, but the residual ridge form and the accuracy of jaw relations were deemed important.
5. Successful prothodontic therapy has been determined by many aspects as mentioned previously.

Once the denture has been delivered there are a series of post-insertion complications that the patient might present with. In a review of the literature Jethlia *et al*, (2013), broadly described these complications or problems:

- 1. Looseness of the new dentures.**

The most common complaint of the edentulous patient in relation to their CDs is usually associated with the mandibular denture. It could be associated with a decrease in the retentive forces and can be explained by a lack of peripheral seal because of an under extended denture border. Inappropriate impression techniques and material used can result in inadequate fit resulting in over extended borders or a warped denture. Lack of occlusal balance and excessive overjet are also factors that influence retention. The other causative factor that can result in looseness of the denture is an increase in displacing forces. Retention is negatively influenced by xerostomia and should be managed by the dentist accordingly.

- 2. Discomfort with new dentures**

These can be associated with occlusal interferences such as premature contact between teeth, lack of incisal overjet, excessive vertical dimension leading to pain and discomfort. There are other systemic factors that can

cause discomfort as well, for example, burning mouth syndrome, herpetic ulcers, and allergies to denture material and denture stomatitis.

3. Support

Resorbed ridges, bony prominences, fibrous displaceable ridge can cause the denture to either sink or rock thus causing pain and discomfort due to compromised areas of support.

4. Retention

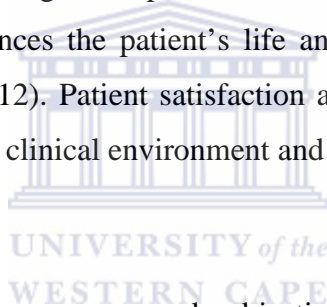
‘Retention is the resistance offered to a force directed at right angles to the seating surface which tends to lift the denture from the supporting surface of the tissues. Stability refers to the maintenance of equilibrium and to the resistance to displacement when masticatory forces act towards the seating surfaces’ (Zarb 2004; Jacobson *et al*, 1983). Lack of either of these will cause dissatisfaction for patients with regards to function.

5. Other complications that can occur post-insertion include:

Excessive vertical dimensions results in a lack of freeway space. The edentulous patient will present with teeth contacting during speech and function, unable to masticate efficiently, unusual appearance, gagging and an altered taste sensation. In a study by John *et al*, (2006) the association between depression and dissatisfaction with CDs was investigated and a possible association was found. There are great clinical implications from studies like these. The symptoms of depression are not always visible and often it does not come up routinely in examination and treatment planning, however awareness of this association is important. Depression can result in treatment failure regardless of the quality of the CDs or the clinical prowess of the dentist (John *et al*, 2006).

3.5. Measuring Patient Satisfaction

In recent years, studies focusing on patient-related outcomes have increased in popularity in Dentistry. The assessment of the denture bearing areas by the dentist is a poor predictor of satisfaction; and a weak correlation exists between the clinical variables and the satisfaction of the patient (Ellis *et al*, 2007). Patient satisfaction with CDs is an important outcome in Dentistry and is directly associated with the treatment they received. Factors such as patient-personality and the dentist-patient interaction can greatly influence the outcome of treatment. The link between patient satisfaction with CD and quality of life is a tenuous one; however complications or dissatisfaction can influence patients' quality of life. Oral health-related quality of life (OHRQoL) is based on the influence the treatment has on the patient's perception of oral health (Michaud *et al*, 2012; John *et al*, 2009). The concept of OHRQoL introduced by Gift and Redford (1992) to capture social and psychological impacts of oral disease, measures the degree to which oral health influences the patient's life and social functioning (AlBaker, 2013; Michaud *et al*, 2012). Patient satisfaction and OHRQoL instruments were developed to assist in the clinical environment and for research (John *et al*, 2009).



When patient based measures are used subjective assessment by the patient is more reliable than functional measures (AlBaker, 2013). This evolution in patient management where emphasis is placed on the effect the treatment has on the patient as a whole has moved to a more holistic approach (Carr *et al*, 2001). There have been great strides in the development of tools measuring OHRQoL in the elderly such as GOHAI, SOHSI, OHIP-49 and OIDP (Hebling *et al*, 2007). After a review of the literature, Locker *et al*, 2007, concluded that the following tools are noteworthy.

Oral health outcome measures developed to date

Pre-1997-

- Social Impacts of Dental Disease
- General (Geriatric) Oral Health Assessment Index (GOHAI)
- Dental Impact Profile (DIP)
- Oral Health Impact Profile (OHIP)

- Oral Impacts on Daily Performances (OIDP)
- Subjective Oral Health Status Indicators (SOHSI)
- Oral Health-Related Quality of Life Measure
- Dental Impact on Daily Living (DIDLS)
- Oral Health Quality of Life Inventory
- Rand Dental Questions

Post-1997

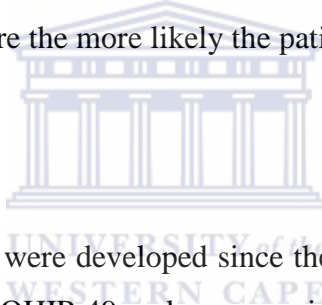
- OHQoL-UK
- Child Oral Health Quality of Life Questionnaire (COHQoL)
- Child OIDP
- OHRQoL for Dental Hygiene
- Orthognathic QoL Questionnaire

In the study by Michaud *et al*, (2012), the association between OHRQoL and patient's satisfaction with CDs was proven and this supports findings by other researchers. (Al Omiri *et al*, 2009). The use of validated instruments such as OHIP to investigate the influence of CDs and implants treatment on the patient satisfaction and OHRQoL has been popular in recent studies. OHIP is one of the preferred tools that measures OHRQoL in the literature (Stober *et al*, 2010; Ellis *et al*, 2007; John *et al*, 2004).

The OHIP is a subjective tool developed and validated by Slade and Spencer using the WHO framework to classify disabilities, handicaps and impairments. The effects of changes in oral conditions such as disability discomfort and dysfunction is measured using the OHIP. This tool has been found to be reliable, consistent and sensitive to change (Al Omiri *et al*, 2010; Slade, 1997). The significant quality of OHIP is that the statements used in the instrument were derived by patient representatives and not dental professionals. This makes the instrument highly sensitive to social impacts of oral conditions that the patients deem important (Al Omiri *et al*, 2009). This also makes the OHIP a refined

instrument to use as a socio-dental indicator to measure the impact oral health has on the patient's life.

The original OHIP-49 was developed to measure patient satisfaction and OHRQoL (Slade, 1997). The OHIP-49 consists of 49 items grouped into 7 subscales. These subscales are functional limitations, physical discomfort, psychological discomfort, physical disability, psychological disability, social disability and handicap (Pommer 2013). The responses are based on a Likert-type scale ranging from 0 to 4, and recorded as 'never' to 'very often'. The OHIP score is calculated by either adding the responses or by categorically scoring of 0 versus 1-4. The internal consistency of the instrument was measured by recording Cronbach's alpha and it ranges between .70 and .83 indicating a good reliability. The higher the OHIP score the more likely the patient has a poor oral health status (Pommer 2013).



Many indicators or tools were developed since the original OHIP-49. The OHIP-20 is a derivative of the OHIP-49 and comprises of 20 statements grouped in seven subscales and involves questions concerning functional limitations, the physical and psychological discomfort, the physical and psychological disability, the social effect of denture wearing on the individual's everyday life, and the degree of handicap (Alfadda *et al*, 2015; Ellis *et al*, 2007). In a study by Montero *et al*, (2012) OHIP-20 was used to measure oral impact and satisfaction in the Spanish edentulous community. The results when using this tool has shown to have exceptional psychometric properties in comparison to OHIP-14 and the Oral Impacts on Daily Performance (OIDP) (Montero *et al*, 2012). The latter two studies failed to address certain effects of oral health on edentulous patients. OHIP-20 has descriptive capacity and hence it can accurately reflect the state of well-being of the edentulous patient.

The principal researcher chose to use the OHIP-20 for its simplicity and easy administration and the fact that it is a multi-dimensional tool. It has been used in many studies showing reliability and has decisively shown insight in patient perception of CDs and OHRQoL. OHIP-20 was ideal because it a validated patient satisfaction instrument has been developed by asking both patients and prosthodontists to list and rank factors they felt determined the success of complete dentures. The OHIP-20 questionnaire is a concise, range of questions that is used to meet a particular requirement for research information about a particular topic. When choosing a tool to assess the OHQoL of geriatric patients it seemed more advantageous to use shorter questions thus aiding compliance, and using OHIP-20 ensured that the specific domains were examined. The OHIP-20 had psychometric properties that made it ideal for the use in the clinical environment. The facilitation of the questionnaire is uncomplicated and easy to understand thus making it ideal in the South African context.

OHIP-14 is a shorter variation of the OHIP-49, and it has been validated. It also retained the original conceptual dimensions but it was found to be unable to detect clinical meaningful changes (Allen *et al*, 2002). The OHIP- Edent is formulated for edentulous patients and has outcomes comparable to the OHIP-49 it was used at UWC in a previous study (Adam *et al*, 2007). However, the OHIP-20 was not used at UWC before and would give a different interpretation of the perceptions of edentulous patients treated in the undergraduate clinic.

Chapter 4

Research Methodology

Introduction

This chapter focuses on the methodology used for this study. It includes a description of the study, sampling and data collection methods as well as the explanation of the data analysis. This was an observational study using two questionnaires for data collection. The questionnaires encompassed two specific fields based on the topic of study namely: patient expectations and satisfaction. Each participant was given an individual case number that corresponded on both questionnaires. This facilitated correlation between the expectations and satisfaction results of individual patients. In addition the principle researcher indicated the year of study of the student treating the patient. This was done to analyse if there was any difference in satisfaction between patients' treated by fourth and fifth year dental students.

4.1. Study design

4.1.1. Sampling

A convenience sample was used in this study from patients that were being treated for CDs by undergraduate students. These patients were sourced from the existing waiting list of the Prosthetics Department at UWC OHC. Edentulous patients were screened by a permanent staff member and placed on a waiting list. The screening process included a brief medical history, an oral examination and a preliminary diagnosis to assess suitability for third fourth or fifth year undergraduate dental students. Residual ridge and anatomical factors that

influence the difficulty of the case were assessed by the dentist thereby ascertaining suitability for undergraduate training. Once the patient had been allocated to a student, a treatment file was opened for the patient, in which the patient's personal details age, address, income was noted and the patient was classified into a category based on monthly income.

The principal researcher then approached the edentulous patients being treated in the undergraduate dental clinic and sought their consent to be participants in this study (Appendix 1& 2). A sum of 100 edentulous patients agreed to participate in this study. The undergraduate dental students followed theoretical and clinically applied knowledge obtained from standard prosthetic teachings and protocols to construct CDs under the supervision of qualified dentists.

4.1.2. Inclusion criteria for this study were: -

- Edentulous patients with healthy oral mucosa,
- Patients that required conventional CDs construction,
- Edentulous patients that have worn complete dentures before. The inclusion of patients that have worn CDs before restricts the comparison or expectations to a previous CDs and not natural dentition.

4.1.3 Exclusion criteria for this study were: -

- First time denture wearers. These patients were excluded because studies have shown that first time denture wearers have high levels of expectations because they compare their CDs to their natural dentition.
- Infected or inflamed oral mucosa,
- Oral pathology,
- Temporomandibular joint dysfunction,
- Neuro -muscular disorder,
- Patients that cannot attend the clinic for the number of sessions required for a CD construction,
- Psychiatric and psychological condition that will influence the understanding and answering of the questionnaire/s.

4.2. Data collection

Data collection was completed from March–December 2014

- Questionnaire 1: PEQ was completed in the undergraduate clinic (Appendix 3).
- Three months after the delivery of CDs Questionnaire 2: OHIP-20 (Allen and Locker, 2002) which measures OHRQoL was completed telephonically by the principal researcher (Appendix 4).
- All the results were coded and entered into a spread sheet by principal researcher.

4.3. Questionnaire 1: Patient Expectation Questionnaire – PEQ

The initial interview was conducted in the clinical area by the principle researcher in order to eliminate inconsistencies in the manner the questionnaires were presented to the participants and lasted for 20 minutes. The first questionnaire which is divided into two sections was completed by a structured interview in which all the questions were directed and asked in the same manner to every respondent which was based on their expectations for the planned treatment.

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Section A

The first part of Questionnaire 1 contained a series of questions that aided data collection on socio-demographic information (age, gender, employment status and ethnicity), socio economic factors (education, employment, and monthly income) and previous denture experience.

Demographic details

The demographic data variables were chosen after taking into account what the literature had used in descriptive studies on patient satisfaction. This allows for parallels to be drawn and to place the South African population in context with international data.

Socio-economic Factors

Education

Subjects were grouped according to the level of education reached:

- No formal education,
- Primary (up to and including Grade 7),
- Secondary up to and including Grade 12 and,
- Tertiary education.

Employment

Four categories were created:-

- Employed,
- Self-Employed,
- Unemployed,
- State Pensioners or grant recipient

Monthly income

Patients were categorised into four groups

- R0- R3500,
- R3500-R 8500,
- R8500 and more,
- State Pensioner

Previous denture experience

Patient's previous denture experience was divided into 3 categories:

- Less than five years denture experience,
- More than five years denture experience.



Section B

This section comprises of questions relating to the patients' expectations. These questions were formulated by the principal researcher by using the framework of the OHIP-20 and creating questions relating to patient's expectations of CDs. In doing so, it allowed for some correlations between the specific variables between this questionnaire and the follow up OHIP-20. These expectation questions are based on conceptual subscales that relate to; functional limitation, physical disability, physical pain, psychological disability and handicap of the patient. The participants were instructed to record their responses in one of five categories with the use of a Likert scale.

Table 1. Patient Expectation Questionnaire (PEQ)

FL	1.	Do you expect to have difficulty chewing because of problems with your dentures?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
FL	2	Do you expect to have food catching underneath your dentures?	Very Often	Fairly Often	Occasionally	Hardly Ever	Never
PD2	3	Do you expect to avoid eating some foods because of problems with your new dentures?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
PD2	4	Do you expect your diet to change/ be unsatisfactory because of problems with your new dentures?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
PD2	5	Do you expect that you will be unable to eat with your new dentures?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
PD2	6	Do you expect to interrupt your meals because of problems with your new dentures?	Very Often	Fairly Often	Occasionally	Hardly Ever	Never
PP	7	Do you expect pain in your mouth as a result of your new dentures?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
PP	8	Do you expect to have sore spots/ ulcers in your mouth because of your dentures?	Very Often	Fairly Often	Occasionally	Hardly Ever	Never
PP	9	Do you expect your new dentures to be uncomfortable? (if not applicable, please mark Never	Very often	Fairly Often	Occasionally	Hardly Ever	Never
PD1	10	Do you expect to be self-conscious because of problems with your dentures?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
FL	11	Do you expect your dentures to fit retentively/ properly?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
H	12	Do you expect your dentures to affect your Quality of Life?	Very Often	Fairly Often	Occasionally	Hardly Ever	Never
H	13	Do you expect you will be satisfied with your new dentures?	Very often	Fairly Often	Occasionally	Hardly Ever	Never

4.4. Questionnaire 2: OHIP-20

Three months after delivery of the CDs the Questionnaire 2: OHIP-20 was completed telephonically by the principal researcher. This was used to assess the Oral Health related Quality of life (OHRQoL) in relation to satisfaction with dentures constructed by undergraduate dental students. A validated patient satisfaction instrument measuring OHRQoL was developed by asking prosthodontists and edentulous patients to list and rank factors they felt determined the success of CDs (Michaud *et al*, 2012). OHIP-20 is a shortened version of the original OHIP-49 (Slade, 1997). It includes 20 statements that are grouped into seven conceptual subscales. The questions relate to:

- functional limitations,
- physical and psychological effects,
- physical and psychological disability,
- social effect of denture wearing on the patient's daily life,
- degree of handicap perceived by the patient (Ellis *et al*, 2007).

The participants of the study answering the questionnaire were asked to record their responses in one of five categories of a Lickert scale. The five categories of response per item were 1) never, 2) hardly ever, 3) occasionally, 4) fairly often and 5) very often. They were 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 (Montero *et al*, 2012).

Table2. Oral Health Impact Profile -20

	1.	Have you had difficulty chewing because of problems with your teeth/ dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
FL	2.	Have you had food catching in your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
FL	3.	Have you felt that your dentures have not been fitting properly?	Very often	Fairly often	Occasionally	Hardly ever	Never
PP	4.	Have you had painful aching in your mouth?	Very often	Fairly often	Occasionally	Hardly ever	Never
PP	5.	Have you found it uncomfortable to eat some foods because of problems with your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
PP	6.	Have you had sore spots in your mouth	Very often	Fairly often	Occasionally	Hardly ever	Never
PP	7.	Have your dentures been uncomfortable? (if not applicable, please mark Never)	Very often	Fairly often	Occasionally	Hardly ever	Never
PD1	8.	Have you been worried by dental problems	Very often	Fairly often	Occasionally	Hardly ever	Never
PD1	9.	Have you been self-conscious because of problems with your teeth or dentures	Very often	Fairly often	Occasionally	Hardly ever	Never
PD2	10.	Have you avoided eating some foods because of problems with your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
PD2	11.	Has your diet been unsatisfactory because of problems with your teeth, mouth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
PD2	12.	Have you been unable to eat with your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
PD2	13.	Have you had to interrupt meals because of problems with your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
PD3	14.	Have you been upset because of problems with your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
PD3	15.	Have you been embarrassed because of problems with your teeth or dentures	Very often	Fairly often	Occasionally	Hardly ever	Never
SD	16.	Have you avoided going out because of problems with your teeth or dentures	Very often	Fairly often	Occasionally	Hardly ever	Never
SD	17.	Have you been less tolerant of your spouse or family because of problems with your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
SD	18.	Have you been irritable because of problems with your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
H	19.	Have you been unable to enjoy other people's company because of problems with your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
H	20.	Have you found life less satisfying because of problems with your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never

Subscale Description of OHIP-20

Questions related to Functional Limitations (FL);

Questions related to Physical Pain (PP);

Questions related to Psychological Discomfort (PD1);

Questions related to Physical Disability (PD2);

Questions related to Psychological Disability (PD3);

Questions related to Social Disability (SD);

Questions related to Patient Handicap (H)

4.5. Data Analysis

4.5.1. Analysis of Questionnaire 1: PEQ

Section A which included the socio demographic details as well as previous denture experience of the patients was collected and it was grouped in order to make meaningful deductions. Frequency distribution was done in order to ascertain the distribution of variables amongst specified intervals.

Section B which included the questions on patients' expectations was collected and a frequency distribution was done on the data. This section of the PEQ was a new tool formulated by the principal researcher and a series of statistical tests was done to assess the validity and reliability of it.

Reliability tests were done on the series of questions that form the PEQ. Reliability is the degree to which an assessment tool produces stable and consistent results by analysing the scale's internal consistency. This was determined by using Cronbach's Alpha. Cronbach's Alpha between 0.7- 0.8 indicates acceptable α value, therefore the findings reveal that the scale was very reliable.

A factor analysis was conducted as a data reduction technique to summarise the items loading under factors summarising the research instrument. Factor analysis removes redundancy or duplication from a set of correlated variables.

All the data collection using Excel and statistical tests were done using the SPSS software.

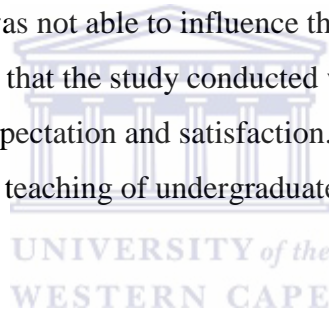
4.5.2. Analysis of Questionnaire 2: OHIP-20

The OHIP-20 is a validated questionnaire therefore reliability and validity tests were not required. Frequency distributions were done on the data collected from the OHIP-20 and a Pearson correlation coefficient was computed to assess the relationship between patient expectation of CDs and patient satisfaction with CDs. A correlation analysis measures the strength of the linear relationship between the

two variables namely patient expectations and patient satisfaction with CDs. All the data collection using Excel and statistical tests were done using the SPSS software.

4.6. Ethical and legal considerations

Ethical clearance was obtained from the UWC Ethics Committee (Registration Number: 13/7/16). All participants signed a consent form (Appendix 5). The patient was informed that participation in this study was voluntary and information offered was strictly confidential. They had the option to refuse to participate in this study or to withdraw at any stage and their choice will not be held against them. The researcher did not play an active role in the treatment of the patient and thereby was not able to influence the outcome of treatment. The participant was informed that the study conducted will assist in identifying the link between patients' expectation and satisfaction. This study will assist the department in improving teaching of undergraduate students.



Chapter 5

Results

Introduction

This chapter includes the analysis of the data obtained in relation to the research questions listed in the aims and objectives of the study. The questionnaires were analysed using statistical software packages, SPSS and Microsoft Excel as discussed in the methodology chapter. Tables and figures are used to illustrate the findings and to complement the interpretation of data analysed. This facilitates the easy identification of areas that require further investigation.



5.1. Analysis of Data

The sample size was calculated and the exclusion criterion was applied and missing post treatment data was taken into account. The initial sample size was 100 patients, at the post treatment follow up questionnaire 2 patients had died and 8 patients were not contactable. Quantitative analysis was used for this study and survey questionnaire. The findings are presented in three main sections for the areas covered within this study namely:

1. Questionnaire 1: PEQ- Section A
2. Questionnaire 1: PEQ- Section B
3. Questionnaire 2: OHIP-20

5.1.1. Statistical Analysis of Questionnaire 1: PEQ-Section A

The PEQ as described in the methodology chapter consisted of a socio demographic section and a patient expectation section was statistically analysed and yielded the following results.

Socio -Demographic details

Data on age, gender, race, was collected. The categorisation based on 'population group' as defined in the Population Registration Act.

Table 3. Demographic Data

Demographic Factor	Frequency	Percentage
Age		
56 – 65	41	45.6
65 +	29	32.2
Gender		
Male	25	27.8
Female	65	72.2
Race		
Coloured	77	85.6
White	7	7.8
Other		

Majority of the sample was in the age category 56-65 years with the second largest percentage 32 %, in the age category 65 years and older. Females made up 72 % of the sample. Eighty five percentage of the sample was Coloured, with Blacks, Whites and Indians completing the sample.

Table 4. Socio-economic Data

	Frequency	Percentage
Education		
Primary	17	18.9
Secondary	67	74.4
Tertiary	2	2.2
No education	4	4.4
Employment		
Unemployed	32	35.6
Pensioner	53	58.9
Monthly income		
Pensioner	50	55.6
Other-(grant recipient)	21	23.3

The data on education: The highest percentage (74.4%) of the sample had some secondary education with the next significant group, 18.9 % that had attended primary school. Pensioners made up 58.9 % of the sample, and 23.3 % were grant recipients.

Table 5. Denture experience

	Frequency	Percentage
Previous denture experience		
Less than 5 years' experience	14	15.5
More than 5 years' experience	76	84.4

A valuable result for this study in Table 5 was that 84% of the sample had more than 5 years denture experience.

Table 6. Student Year

Student year	Frequency	Percentage
IVth	68	75.6
Vth	22	24.4

Table 6 indicates that majority of the sample 75 % was treated by fourth year dental students.

5.1.2. Statistical Analysis of Questionnaire 1- PEQ Section B

The second aspect to be discussed under analysis is related to the expectations questions of the PEQ. For the questions on the PEQ with responses very often and fairly often, never and hardly ever were combined into one group as ‘often’ and ‘never’ to assess the impact on all variables. The descriptive statistics which includes the mean and standard deviation for the PEQ is attached (Appendix 7).

The results for the PEQ include:

1. Cronbach’s Alpha equalled to **.773**, which indicates a good reliability. Cronbach’s Alpha between 0.7- 0.8 indicates acceptable α value, therefore the findings reveal that the scale was very reliable.
2. A factor analysis was conducted as a data reduction technique. (Table 7) In the process of validation a factor analysis yielded a four factor solution (Eigen values of extracted factors >1). The total variance of the four factors was 64.4%. Reliability for two of the identified factors yielded was conceptually stronger than the latter two and was disregarded from the analysis. These two factors were related to functioning (mastication) and pain. (Tables 8 &9).

Reliability would increase if the following items were dropped:-

Q10. Do you expect to be self-conscious because of problems with your dentures?

Q12. Do you expect your dentures to NOT affect your Quality of Life?

The reasons for inconsistency in answers could be due to the lack of understanding and interpretation of the statements.

Table 7. Factor Analysis of Patient Expectations Questionnaire (PEQ)

Scale items	Component			
	Factor 1	Factor2	Factor3	Factor4
Q1. Do you expect to have difficulty chewing because of problems with your dentures	.668			
Q2. Do you expect to have food catching underneath your dentures	.732			
Q3. Do you expect to avoid eating some foods because of problems with your new dentures	.789			.364
Q4. Do you expect your diet to change/be unsatisfactory because of problems with your new dentures	.811			
Q5. Do you expect that you will be unable to eat with your new dentures	.755			
Q6. Do you expect to interrupt your meals because of problems with your new dentures	.750			-.300
Q7. Do you expect to have pain in your mouth as a result of your new dentures		.902		
Q8. Do you expect to have sore spots/ulcers in your mouth because of your dentures		.855		.309
Q9. Do you expect your new dentures to be uncomfortable				.776
Q10. Do you expect to be self-conscious because of problems with your dentures				.344
Q11. Do you expect your dentures to NOT fit retentively/properly		.454	.434	
Q12. Do you expect your dentures to NOT affect your Quality of Life			.811	
Q13. Do you expect you will be NOT satisfied with your new dentures			.810	

Table 7 indicates the loading of each statement during factor analysis of the PEQ.

Reliability tests

Reliability tests were conducted on the two factors identified from the factor analysis. The internal consistency estimates of reliability of the scale measuring patient expectations.

Table 8. Factor 1 – Mastication

Factor 1- MASTICATION	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q1. Do you expect to have difficulty chewing because of problems with your dentures? (FL)	.616	.840
Q2. Do you expect to have food catching underneath your dentures?(FL)	.655	.830
Q3. Do you expect to avoid eating some foods because of problems with your new dentures? (PD2)	.708	.820
Q4. Do you expect your diet to change/be unsatisfactory because of problems with your new dentures? (PD2)	.710	.820
Q5. Do you expect that you will be unable to eat with your new dentures? (PD2)	.610	.838
Q6. Do you expect to interrupt your meals because of problems with your new dentures? (PD2)	.578	.844

Table 8 contains the questions and domains identified that formulate the first factor -Mastication.

Table 9. Factor 2 – Pain

Factor 2- PAIN	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q7. Do you expect to have pain in your mouth as a result of your new dentures? (PP)	.684	.315
Q8. Do you expect to have sore spots/ulcers in your mouth because of your dentures? (PP)	.668	.349
Q11. Do you expect your dentures to NOT fit retentively/properly?(FL)	.213	.887

Table 9 contains the questions and domains identified that formulate the second factor - Pain

5.2. Description of the frequency distribution of PEQ

As discussed in the methodology chapter, the questions were grouped into subsections.

Questions relating to Functional Limitations (FL)

- Majority of the sample indicated that they never expected to encounter difficulty with chewing or have food catching as a result of the new CDs.
- A large portion of the sample (87 %) did not expect their CDs not to fit properly.

Questions relating to Physical Disability (PD 2)

- Majority (66.6%) of the sample felt that they would never avoid certain foods or feel that their diet would be unsatisfactory because of CDs.
- In addition the largest part of the sample expressed an expectation to never be unable to eat or to interrupt their meals because of problems with the new CDs.

Questions relating to Physical Pain (PP)

- About half of the sample expected to experience pain as a result of the new CDs but this was not evident in relation to the satisfaction scores for this question. More than two thirds (64%) of the sample felt that their new CDs would never be uncomfortable.

Questions relating to Psychological Discomfort (PD1)

- Less than half of the sample (44.5%) felt they would be self-conscious because of problems with their CDs.

Questions relating to Handicap (H)

- The greater part of the sample (95.5%) felt that their dentures would impact on their Quality of life and (97.8%) felt they would be satisfied with their new CDs.

5.3. Statistical analysis of OHIP-20

5.3.1. Description of the frequency distribution of the OHIP-20

As discussed in the methodology chapter, the questions were grouped into subsections.

Questions related to Functional Limitations (FL)

- More than one third (37%) of participants never encountered difficulty chewing with one third of the sample (32.2%) experiencing food catching underneath their new CDs and 43.4% of the sample felt their CDs were not fitting properly.

Questions related to Physical Pain (PP)

- Majority of the sample 40% had pain due to CDs.
- The largest portion of the sample, 38% did not find it uncomfortable to eat certain foods; however 35.6% had sore spots in their mouth because of their new CDs. Less than half of the sample 33.3% felt their CDs have never been uncomfortable.

Questions related to Psychological Discomfort (PD1)

- Less than one third of the sample (28.9 %) has been worried about dental problems with a similar percentage (26.7%) of the sample being self-conscious because of problems with their CDs.

Questions related to Physical Disability (PD2)

- Just about half of the sample (51.1 %) never avoided eating some foods with the same amount of participants (51.1%) feeling their diet was never unsatisfactory because of problems with their CDs.
- A third of the participants (31.1 %) felt they were unable to eat with their new CDs, and less than a third (28.9%) of the sample had to interrupt meals because of problems with their CDs.

Questions related to Psychological Disability (PD3)

- Two thirds of the sample felt they were never upset or embarrassed because of problems with their CDs.

Questions related to Social Disability (SD)

- Majority of the sample (82.2%) never avoided going out because of problems with their CDs and similarly 83.3% were never intolerant with their spouse and family. A very small percentage (8%) of the sample felt irritable because of problems with their CDs.

Questions related to Patient Handicap (H)

- A minority of the sample (4.4%) often felt they were unable to enjoy other peoples' company because of problems with their CDs, and (13.3%) the sample felt that life was less satisfying because of problems with their CDs.

5.4. Comparison of the PEQ and OHIP-20

A Pearson correlation coefficient was computed to assess the relationship between patient expectation of CDs and patient satisfaction with CDs.

Table 10. Correlation of Expectations and satisfaction

	Satisfaction
Expectation	.112
Pearson correlation Sig (2-tailed)	.295 N = 90
Expectation Factor1 Mastication	.092
	.389
	N=90
Expectation	.141
Factor2	.186
Pain	N=90

If Pearson correlation $r = +.70$ it indicates a positive relationship. However since $r = .11$ there was no correlation between the two variables namely expectation and satisfaction. This means that it is statistically not significant and no positive relationship exists between these two variables.

5.5 Graphic representation of PEQ and OHIP frequency distribution comparison

The following graphs illustrate the various responses to the corresponding questions by the participants in the domains identified in the questionnaires discussed in the methodology chapter.

Functional Limitations

In the domain of functional limitations the high expectations regarding retention and mastication is noteworthy where the negative result would be the small percentage of participants that experienced discomfort with the new CDs.

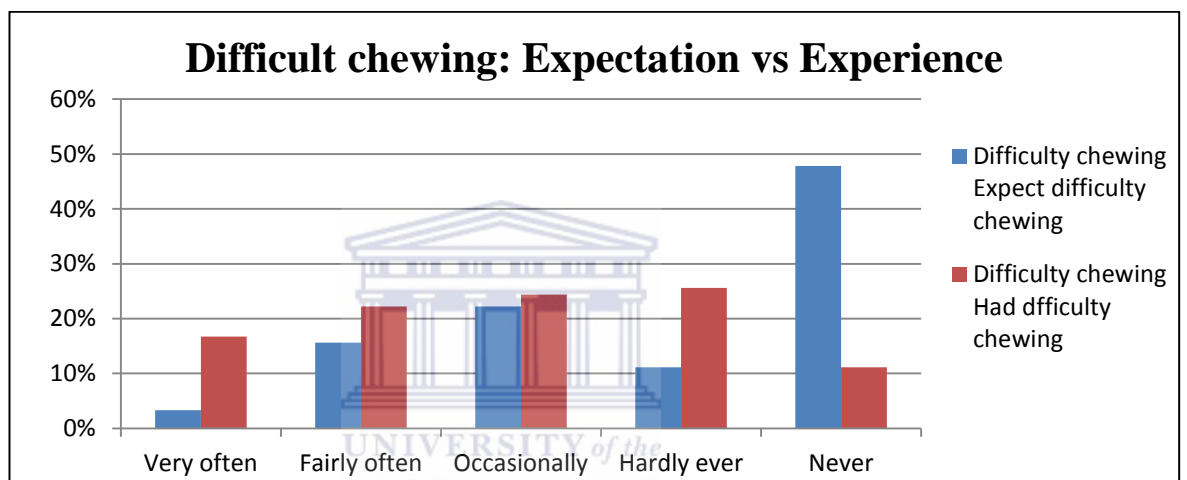


Figure 1. This graph depicts the expectation to have difficulty chewing because of problems with the new CDs in relation to difficulty experienced.

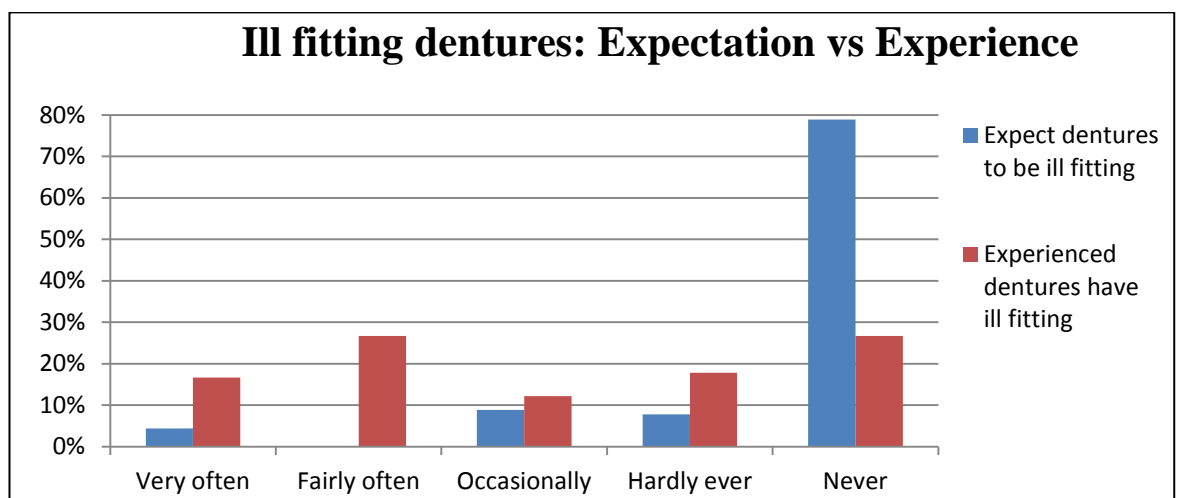


Figure 2. This graph depicts the expectations that the new CDs will not be retentive in relation to having experienced retention problems.

Physical Disability

High expectations were found in the questions related to unsatisfactory diet and the avoidance of certain foods. This comparison between what the participants expected and perceived did however show that a fair amount of food avoidance occurred.



Figure 3. This graph depicts the expectation to avoid eating certain foods because of problems with the new CDs in relation to having avoided certain foods?

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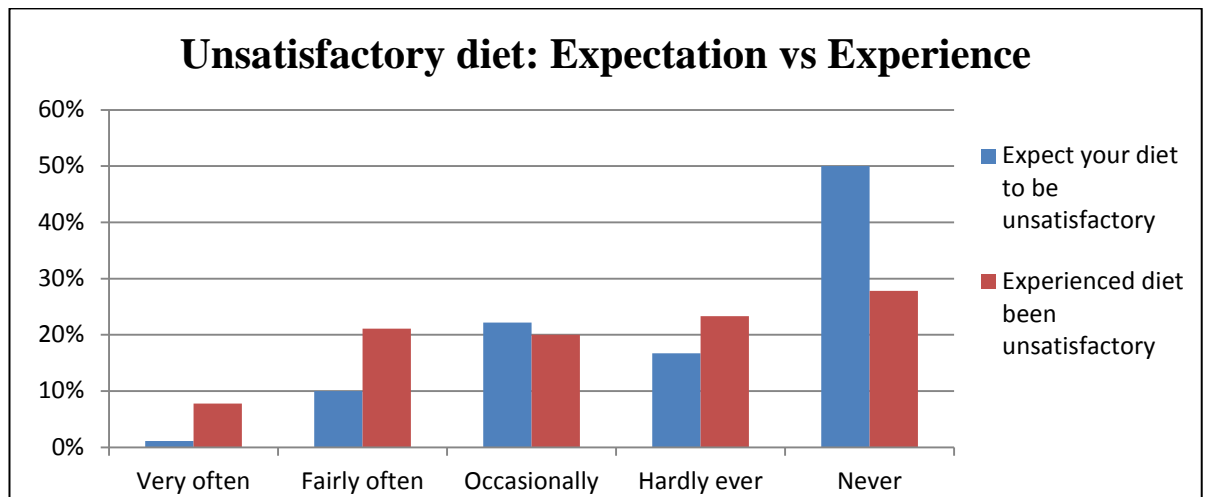


Figure 4. This graph depicts the expectation to have an unsatisfactory diet because of problems with the new CDs in comparison to having experienced a change in diet.

A significant result is noted in Figure 4, where a high percentage of the sample anticipated their diet to be unsatisfactory.

Physical Disability continued:

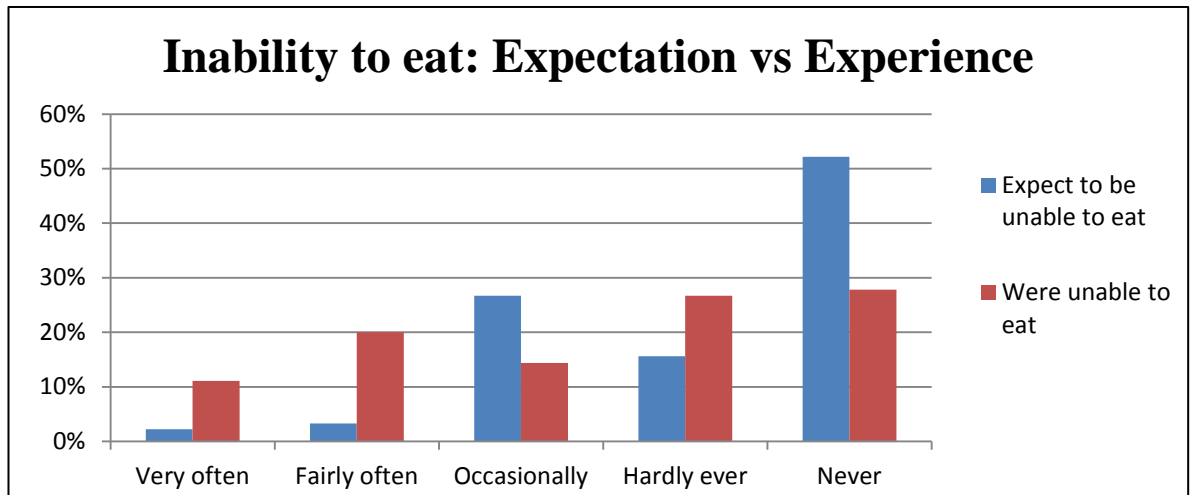


Figure 5. This graph depicts the expectation to be unable to eat with new CDs in relation to having experienced an inability to eat.

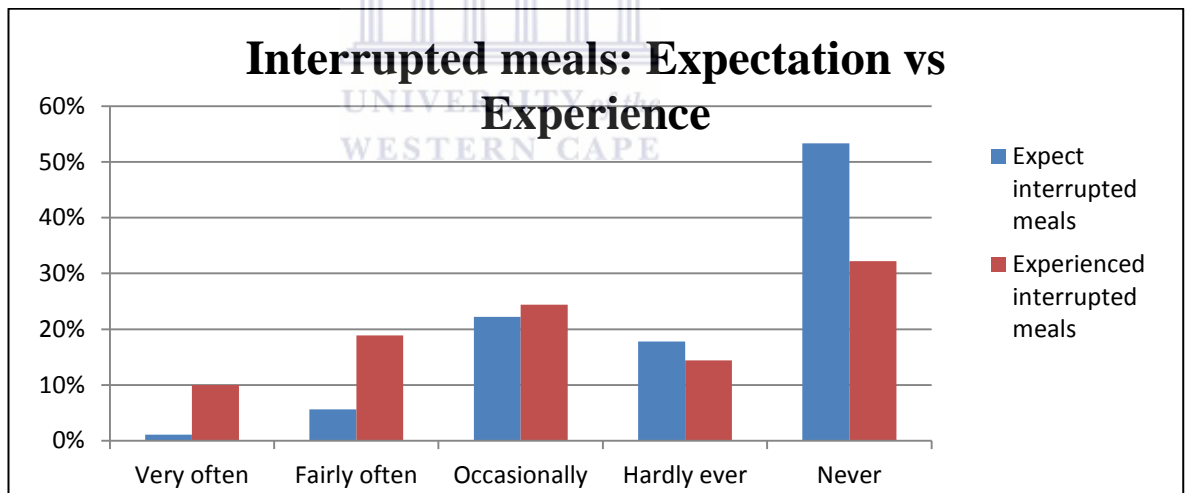


Figure 6. This graph depicts the expectation to interrupt meals because of problems with new CDs in comparison to having experienced meal interruption?

High levels of expectations were noted in relation to diet and meal interruption in the physical disability domain. These factors relating to mastication is impacted by the construction of retentive CDs.

Physical Pain

Majority of the participants did not expect pain and discomfort with sore spots in their mouths and significantly this was not experienced in the physical pain domain.

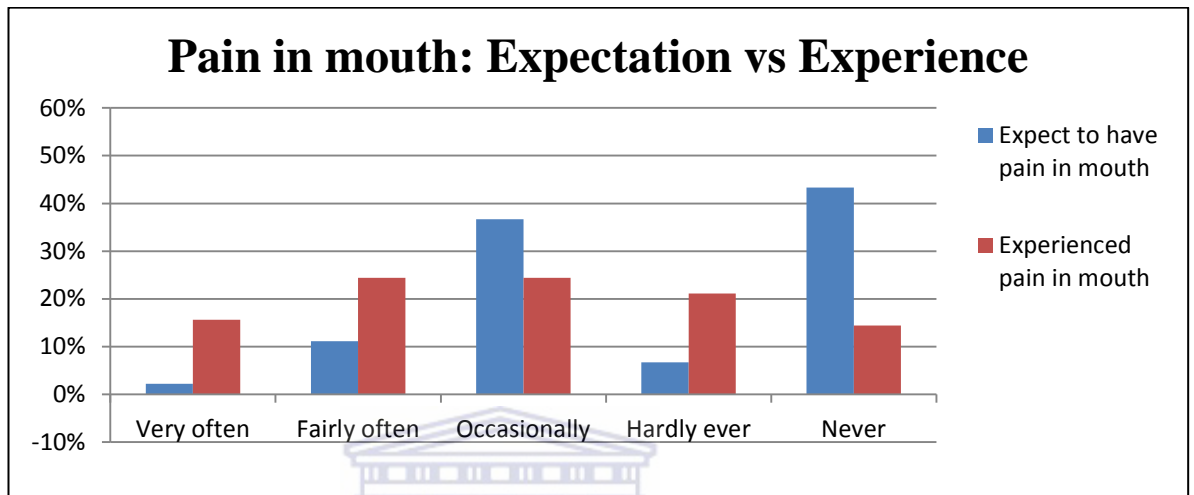


Figure 7. This graph depicts the expectation to experience pain because of the new CDs in relation to pain experienced.

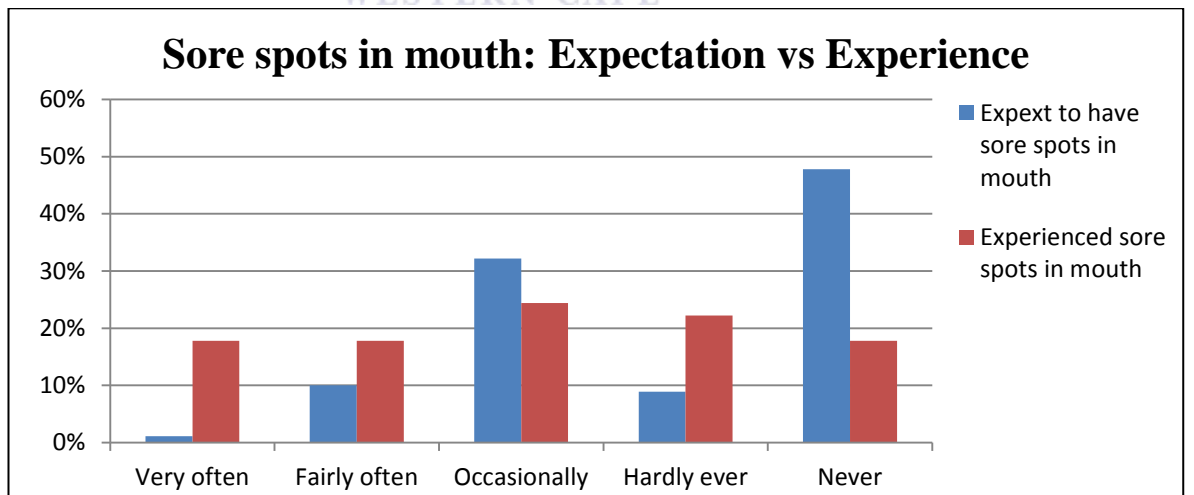


Figure 8. This graph depicts the expectation to have sore spots due to new CDs in relation to having had sore spots as a result of dentures.

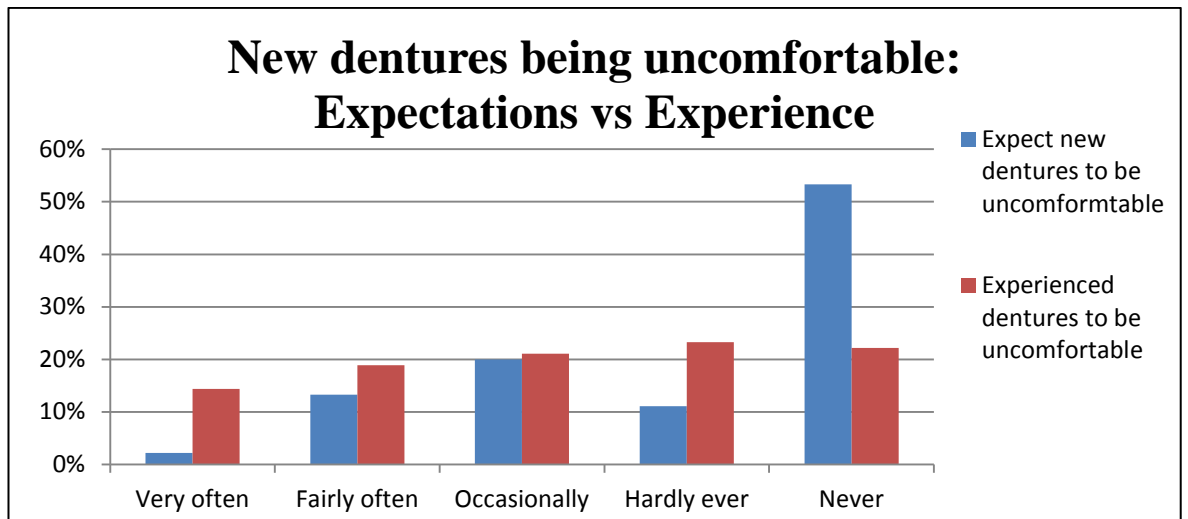


Figure 9. This graph depicts the expectation that the new CDs will be uncomfortable in relation to having experienced discomfort.

A noteworthy result in Figure 9 was the majority of the sample anticipated the new CDs never to be uncomfortable and post treatment a small percentage actually experienced discomfort.

Psychological Discomfort

A positive result in the psychological discomfort domain was the minimal impact CDs constructed by the dental students had on patients emotional well-being.

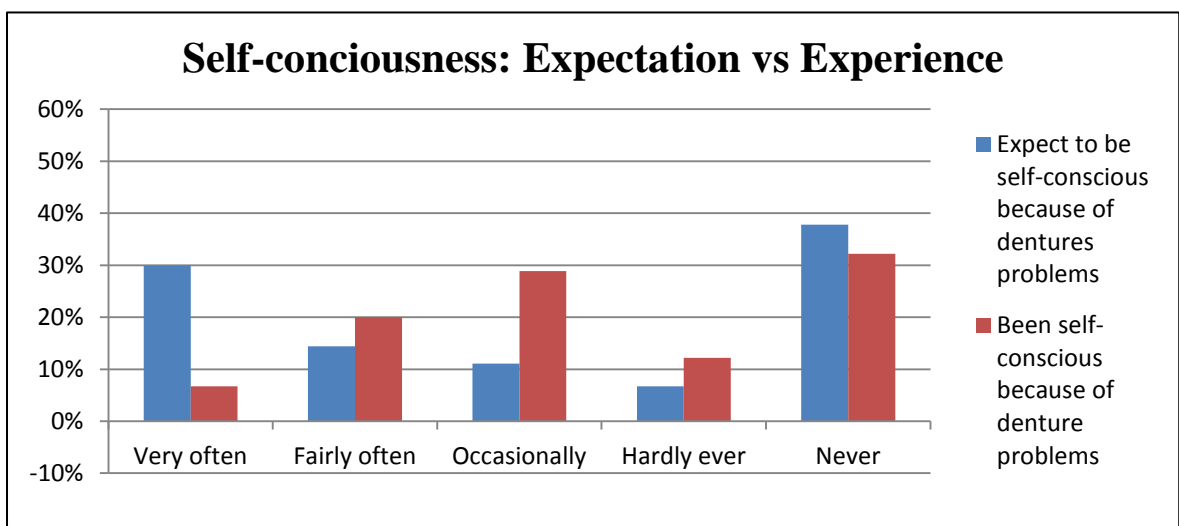


Figure 10. This graph depicts the expectation to be self-conscious because of the new CDs in relation to having been self-conscious.

Chapter 6

Discussion

This chapter provides an interpretation of the results obtained in this study on expectations and satisfaction with CDs constructed by the dental students at UWC.

The null hypothesis as stated in the introduction of this study was that patient's expectations do not influence their overall satisfaction with their complete dentures when constructed by undergraduate dental students. This hypothesis was accepted in the interpretation of the Pearson correlation that showed there was no significant correlation between the two variables namely expectation and satisfaction. The analysis of the frequency distribution of both questionnaires supported this finding with high levels of expectation and satisfaction noted in all domains. The discussion of this study will be divided into three sections based on the questionnaires discussed in the methodology chapter.

6.1. Discussion of PEQ- Section A

Socio -demography of the Sample

Age, gender and ethnicity of the sample

The majority of the sample was aged 56 years and older with a third of the sample being over 65 years and this is similar to results found in the literature (Emami *et al*, 2013; Van Wyk *et al*, 2004). Edentulism has been extensively investigated in South Africa and a high prevalence was found amongst the population (Thorpe, 2006; Van Wyk *et al*, 2004). Factors such as cultural influence, incorrect oral hygiene practices, lack of water fluoridisation, inadequate infrastructure of the oral health sector and less importance placed on oral health care can lead to early loss of teeth. This increases the risk of being edentulous earlier in life (Emami *et al*, 2013; Polzer *et al*, 2010; Carlsson, 2009; Friedling *et al*, 2007).

Females made up the largest gender component in the study. This follows the trend that females lose their teeth earlier and hence can become edentulous before their male counterparts (Kovac *et al*, 2011; Pan *et al*, 2008; Celebric *et al*, 2003). Females tend to be less satisfied with their edentulous state and are most likely to seek out methods to improve their appearance whereas males are less inclined to seek treatment for edentulism (Suresh *et al*, 2010). In the frequency analysis of the data a high level of satisfaction was perceived amongst the sample and this too is indicative of a bigger female component.

Patients of coloured ethnicity formed the largest part of the sample. This is supported by studies that found the coloured community has a higher prevalence of edentulism (Friedling *et al*, 2007; Van Wyk *et al*, 2004). This disparity in edentulism amongst ethnicity can be attributed to factors specific to the coloured community (Friedling *et al*, 2007). The possible reasons for this include acceptance into the community, lack of understanding of preventative measures and cultural beliefs. Another reason for this high incidence of coloured participants of the study is the geographic location of the Oral Health Centres. Both the Tygerberg OHC and Mitchell Plain OHC are the main oral health service providers for a vast feeder area where the majority of the community is of coloured ethnicity.

Socio Economic Factors

Secondary education was achieved by most of the participants. Studies have shown that levels of education play a fundamental role in the rate individuals become edentulous (Kovac *et al*, 2011; Turker *et al*, 2009; Celebric *et al*, 2003; Van Waas, 1990). The higher the rate of education, the less likely the individual will become edentulous. In this study 74 % of the sample has secondary school education but noting that 84 % was of coloured ethnicity raises a few questions. Does being part of a previously disadvantaged community play a role in the amount of exposure to oral health care education these individuals have and hence can result in an increase in the rate of tooth loss? The results of this study

corroborates early tooth loss in the coloured community resulting in edentulism, however the large percentage of the sample had secondary school education and that does not tie in with the literature that education can stall tooth loss (Kovac *et al*, 2011; Turker *et al*, 2009).

About two thirds of the sample was pensioners, and one third of the sample was unemployed. This can be explained by the fact that currently no state clinic constructs CDs for the public in the Western Cape Province. It also reflects the socio economic status of the areas surrounding the Oral Health centre. As discussed in literature review, oral health care for geriatrics should be a key performance area in Oral Health care (Govender *et al*, 2014; Petersen 2010; Thorpe, 2001).

The analysis of the socio demographic and socio economic data raises a question regarding the significant incidence of edentulism in the Western Cape. Should the dental faculty not have a more proactive role in the surrounding communities to elevate this burden of disease? The waiting list that is in place in the prosthetics department is evidence that there is a great demand for CDs. Based on the age of the patients that form part of the sample and socio economic status of the participants it is evident that majority of the patients that seek treatment for edentulism is dependent on state services for treatment and therefore require intervention on a national level.

The financial implications should not be over looked. Does the fact that there is no cost or minimal cost involved in being treated at the OHC influence their satisfaction? It is my opinion that it does influence the levels of satisfaction based on the levels of satisfaction perceived and taking into consideration the age of the sample participants. Previous denture experience has a role to play in perceived satisfaction with new CDs due to the adaptation the edentulous patient has achieved already. Majority of the sample (84 %) has more than 5 years'

experience and this was found in literature on factors that influence satisfaction (Kovac *et al*, 2011; Celebric *et al*, 2003; Van Waas, 1990).

The study sample was treated by either fourth or fifth year dental students. The level of satisfaction of the edentulous patient can be influenced when treated by undergraduate students (Wieder *et al*, 2013; Sachdeo, 2012; Van Waas, 1990). Majority of the sample (68%) were treated by fourth year dental students who can be classified as seniors in the undergraduate clinic. This can influence patient's perception of the competency of the student treating them hence the high rate of satisfaction. In relation to the levels of satisfaction it supports the results in studies conducted by Kimoto *et al*, (2001) that stated that patients treated in a teaching institution have high levels of satisfaction. This reflects positively with what the student are taught regarding management of edentulous patients in the Prosthetics Department.

6.2. Discussion of PEQ Section B

The statistical analysis of the patient expectations questionnaire as explained in the methodology chapter included a reliability test as well as factor analysis. Reliability tests using Cronbach's Alpha was required in order to validate the questionnaire formulated by the principal researcher. Once the reliability was ascertained factor analysis was completed on the questionnaire. These factors were related to mastication and pain and cover the functional limitations and physical disability domains. This result resonates with the study conducted by Smith *et al*, (2004) which concluded that edentulous patients have expectations regarding aesthetics, comfort, speech and mastication. In studies conducted on patient expectations the fear of a negative outcome is well documented and this can correlate with the findings of this study (Miranda *et al*, 2014; Marachlioglou *et al*, 2010).

The analysis of the frequency distribution of the PEQ yielded high expectations in all the sub sections of the questionnaire. Even though the high expectation that was recorded for the 2 factors, ease of mastication and lack of pain is noted in the literature it can be deemed unrealistic (Marachlioglou *et al*, 2010; de Souza e Silva *et al*, 2009; Smith *et al*, 2004).

A result that was noteworthy was that more than half of the sample felt they would be self-conscious as a result of problems with their new CDs. This is similar to studies that were done to investigate why edentulous people with new CDs are dissatisfied (Cooper, 2009; Waas, 1990). The item quality of life showed a high level of expectation and there was a great expectation regarding satisfaction with new CDs (Michaud *et al*, 2012). The high levels of expectations can also be explained by the high percentage of females in the sample and since females tend to have higher expectation than male counterparts for aesthetics and function and tend to seek treatment for edentulism more readily. (Suresh *et al*, 2010).

In addition to the above mentioned clinical aspects of patient expectations the fact that treatment was received at a teaching institution could influence the high levels of expectation perceived in this study. This finding is similar to studies conducted by Karydis *et al*, 2001 and Douglass *et al*, 2000.

6.3. Discussion of the OHIP-20

When analysing the OHIP-20, high levels of satisfaction were recorded in most of the domains of the OHIP-20. The most important factors that influence satisfaction is perceived pain, retention of the CDs, aesthetics, function and speech (Viola *et al*, 2012; Reissmann *et al*, 2011; Critchlow *et al*, 2010; Adam *et al*, 2007; Allen *et al*, 2003; Roessler, 2003; McGrath *et al*, 2001; Douglass *et al*, 2002).

In the functional limitations domain high levels of satisfaction was recorded. This can be interpreted as satisfaction with mastication with the new CDs and this

result ties in with literature that states mastication is linked to satisfaction (Critchlow *et al*, 2010; Roessler, 2003). Even though majority of the sample felt that their new CDs were fitting properly, it is concerning that such a significant percentage of the sample did not experience that. This could be explained by the difficulty the edentulous ridge, jaw relations and maladaptive patient's poses during construction of the CDs (Viola *et al*, 2013; Carlsson *et al*, 2009; Fenlon *et al*, 2008).

Majority of the sample encountered pain and ulcers, which can be interpreted as pain perceived as a result of the new CDs. This means that the expectation regarding pain was not met. Perception of pain is a subjective one and each individual's psychosomatic make up plays an integral role in it and should not be a reflection of denture quality (Janowski *et al*, 2013; Lee *et al*, 2008).

A large percentage of the sample was not concerned or self-conscious about dental problems or their new CDs in psychological discomfort sub section. This contradicts the findings in studies that concluded the patients did not expect to be self-conscious or concerned about dental problems however this outcome resonates with the study by Al Omiri *et al*, (2010) that concluded older patients have less stress related to conforming to society and this could be related to the individuals being more psychologically stable (Al Omiri *et al*, 2010; Van Waas *et al*, 1990; Vallittu *et al*, 1996).

An interesting result in the physical disability was that half the sample avoided certain foods, but two thirds of the sample did not feel their diet was unsatisfactory or that they were unable to eat. This contradicts the finding by Emami *et al*, 2013 that concluded edentulous patients change their diets as a result of inability to function adequately.

In the psychological disability subsection two thirds of the sample were never upset or embarrassed because of CDs. This concurs what studies have found regarding speech and aesthetics (Sato *et al*, 2000). The influence of neuroticism and patient personality traits could be the possible reason patients did not experience any embarrassment as a result of their oral health status. In addition to the aforementioned reason most of these patients have had varying levels of edentulism throughout their lives and the fact that the society they are a part of is accustomed to tooth loss could mean they are comfortable with their edentulous state.

Finally, the Pearson correlation that was conducted between PEQ and OHIP-20, showed no significance. This can be explained that expectation and satisfaction are two distinct variables. From the literature the patient factor could possibly explain the lack of significance. The psychosomatic factor that was extensively discussed in the literature, explains how each patient has an internal or external locus of control. This phenomenon could possibly be the factor that links expectations and satisfaction, and further investigation is required.



6.4. Discussion of the comparison between the PEQ and OHIP-20 frequency distribution.

When analysing the two questionnaires namely PEQ and OHIP in relation to one another, it was evident that the patient's expectations were met in most of the sub sections. The following was observed in the corresponding sub sections:

Functional Limitations (FL)

The expectation that the edentulous patient had regarding difficulty chewing was met but there was a significant percentage that encountered some difficulty and this can be explained by the complexity the edentulous patient presents with. The management of edentulous patients is multi factorial. Patients present with atrophic, mobile and fragile tissue. Most of the patients that are treated at the

faculty have been edentulous for a long period, and makes treatment a challenge. A positive outcome under the functional limitations subsection was the small percentage of the sample (32%) that had food catching underneath their new dentures.

Physical Pain (PP)

Even though more than half of the sample expected to experience pain or present with ulcers as result of their new CDs, only forty percent had experienced pain and ulcers. This can be explained by the numerous recall visits the patients have at their disposal. The same theory can be applied to the statement regarding the new dentures being uncomfortable, where the satisfaction rating was higher than the expectation. The advantage of being treated in a teaching institution is the amount of time spent on recall visit and adjustments of the new CDs.

Physical Disability (PD2)

The expectation that edentulous patients would not avoid certain foods, was met and this could be explained by the fact that majority (76%) of the sample had worn dentures before. So adaptation has occurred and diet would not be unsatisfactory. Function with CDs is dependent on occlusion and denture quality (Ribeiro *et al*, 2012; Anastassiadou *et al*, 2006; Narain *et al*, 2010). The implication is that clinical guidance given to students in the construction of CDs has positive results. A very small percentage interrupted their meals, due to problems with their CDs and this could tie in with unfavourable denture bearing areas that could have influenced the construction of the new CDs.

Psychological Discomfort (PD1)

45% of the sample expected to be self-conscious but only 26% of the sample was actually self-conscious as a result of their new CDs. This is an important outcome

because the psychological impact on a patient is long term, and can greatly influence patient satisfaction. This result contradicts research that found that a change in patients' oral health can negatively influence self-confidence and cause lower morale and the ability of the individual to enjoy daily activities (Smith *et al*, 2009).



Handicap (H)

Ninety five percentage of the sample felt that their dentures would impact on their quality of life; however only 87% felt that their lives were more satisfying because of their new dentures. In the study conducted by Adam *et al*, 2007 similar results were found. There is evidence in the literature that directly links an increase quality of life to satisfaction with CDs (Michaud *et al*, 2012; Al Omiri *et al*, 2009).

The comparison between the two questionnaires has shown that patient satisfaction has been achieved. High expectations were evident, and were managed and this is a positive reflection on the undergraduate training at UWC.



Chapter 7

Conclusions

From the extensive results obtained for this study, the following conclusions related to the objectives of the study are:

1. The results indicate that patients have high levels of expectations prior to receiving new CDs.
2. No association was found between pre-treatment expectation and patient satisfaction with CDs.
3. Certain socio-demographic factors influenced patient satisfaction with CDs
4. High levels of Patient satisfaction were recorded regardless of the clinical experience of the undergraduate dental student.

This study supported findings by other researchers in which factors such as aesthetics, function and pain were identified as the areas where patients expressed high levels of expectations. This study concluded that patient expectations do not influence satisfaction with new CDs. Educating patients and spending sufficient time understanding the needs of patients play a fundamental role in meeting patient's expectations and a successful outcome.

OHIP-20 proved useful in assessing patient satisfaction and in determining the impact on OHRQoL. The results of the study were similar to previous studies conducted at UWC. Patient satisfaction studies will always be important and the data extracted from studies prove to be useful in the academic field. In this study the importance of providing CDs that allows for efficient, pain-free mastication in addition to fulfilling aesthetic requirements was the most important outcome patients desired. This conclusion supports studies in this field and reaffirms the validity of the OHIP-20 as a useful tool to ascertain what influences patients satisfaction with CDs.

Significant results in the socio-demographic section were that females were the majority in the sample. This can explain the high levels of expectation and satisfaction in certain domains. In addition there was negative relationship between income and education with levels of satisfaction. The age of the patient influences levels of satisfaction with the elderly more appreciative and satisfied with CDs. These associations show the influence socio-demographic data has on interpretation of results when assessing patient satisfaction and expectations.

The results of this study will assist in improving the approach to treatment planning of edentulous patients by firstly quantifying and elaborating on the importance patients' expectations are in the clinical environment and the various factors that influence satisfaction with CDs.

This study highlights the fact that CDs are the most cost effective treatment modality for edentulism in the community that uses state clinics for their primary source of oral health treatment that patients are satisfied with. The growing number of individuals that become edentulous and seek treatment therefore requires structured intervention on behalf of the Department of Health. Thus making provision of CDs a priority at the faculty and by continuing to service the community through the Prosthetic Department it will assist in the alleviation of this handicap.

Lastly this study showed high levels of satisfaction in the sample treated by undergraduate dental students. There are many positive deductions such as effective clinical teaching and patient management that can be made from this outcome and this study can be the basis for many studies on the treatment of edentulous patients in the Prosthetic Department.

Limitations of the study

A few limitations were identified:

1. Different socio-economic groups and their denture needs

It was not specified for this study. Reflecting on the inclusion criteria, for this study the researcher did not divide patients according to old racial profiling as the socio-economic status follows this trend, thus their needs would have differed.

2. First time denture wearers

The intention was not to include them but in retrospect, determining their expectations maybe would have given the study a different picture all together. We are aware of the fact that these patients would have set their expectations against the natural teeth they had, and this would have been unrealistic. So, some consider the exclusion of these patients as a limitation, but the researcher wanted to reduce the variables/ bias for the included sample.

3. The denture construction by undergraduate students

Even though the undergraduate student was supervised by clinical teachers, the CDs construction encompasses many other aspects of learning and clinical teacher and dental technician guidance and these may have masked some of the real issues that could have been addressed.

4. Lack of insight into the psychological aspects that affect expectations and subsequent satisfaction with CDs wearing. This could be achieved by determining the psychological or personality profile of the edentulous patient by using a questionnaire like Neuroticism Extraversion Openness Five-Factor Inventory (NEO-FFI).

5. The lack of reliable and comparable data on edentulism in the Western Cape.

Recommendations

A variation of this study would be to include patients treated by third year dental students. This study could determine if there is a difference in levels of satisfaction of edentulous patients treated by junior students and senior students. Third year dental students complete all laboratory procedures themselves whereas senior students have their laboratory work completed by laboratory technicians.

Future studies on CDs constructed by undergraduate students should include an examination of the denture quality/ functioning with dentures/ aesthetics and measuring thereof in order to ascertain the impact it has on patients' satisfaction

In addition to aforementioned recommendations delving into the impact that the psychosomatic characteristic of the edentulous patient has on treatment will give clinicians greater insight into successful management of patients. There are significant implications for the teaching of CDs in the undergraduate dental clinic and the importance of attaining patient satisfaction by meeting expectations should be reinforced

The results of this study have implications for the management of geriatric and those edentulous patients dependent on the state for their primary health care. Little or no priority is placed on providing CDs to the public and active engagement between State clinics, Universities and the Department of Health will aid in meeting the demand. By doing a cost analysis it can be determined whether the state owning laboratories or outsourcing facilities to complete laboratory work for public employed dentists will aid in reducing the burden.

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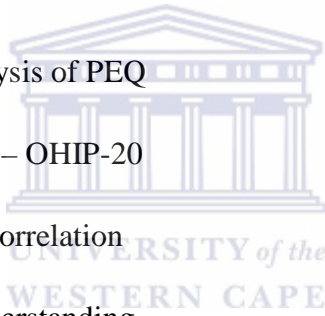
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Appendices

1. Information to Participants
2. Consent form
3. Patient Expectation Questionnaire (PEQ)
4. OHIP-20
5. Ethic Registration
6. Socio Demographic Raw Data
7. Descriptive Statistics – PEQ
8. Cronbachs Alpha
9. Raw Data Factor Analysis of PEQ
10. Descriptive Statistics – OHIP-20
11. Raw Data -Pearson Correlation
12. Memorandum of Understanding
13. Abstract of Internal Association for Dental Research (IADR)
14. Poster IADR 2015





RESTORATIVE DENTISTRY

Information for clinical research

The aim of this study is to investigate whether patient's expectations influence satisfaction with complete removable dentures constructed by undergraduate dental students. The study will assist in identifying the links between expectation and satisfaction, and the factors that influence it.

This research project will be conducted by, Dr R Ahmed a lecturer in the Restorative Cluster of the Dental Faculty of the University of the Western Cape. This study will coincide with the construction of complete dentures by undergraduate dental students that will be supervised in the prosthetic clinic by qualified dentists employed by UWC.

As a patient of the Prosthetic department, you will be required to answer 2 questionnaires. The initial questionnaire will relate to your expectations regarding the complete removable denture, as well as questions pertaining to your socio demographic status. The second questionnaire, which can be completed telephonically will relate to levels of satisfaction in relation to the new dentures you have received.

Your personal and medical information provided will be strictly confidential and your identity will be protected. Your decision to participate in this study will not influence the outcome of your treatment. No monetary compensation will be offered and no extra costs will be incurred by you the patient. The results of this study will assist in the teaching of undergraduate dental students and facilitate greater understanding in patient's expectations and satisfaction in prosthetic dentistry.

If you have any further questions regarding this research project, please contact me on the details provided.

Thanking you in anticipation

Dr R Ahmed

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RESTORATIVE DENTISTRY

Informed consent for this study on expectations and satisfaction with complete dentures constructed by undergraduate dental students

I would appreciate your participation in this Research Project as explained to you at the initial clinical visit. There are no known risks associated with participating in this study. Your personal information will be strictly confidential and your identity will be protected at all times. You have the option to refuse to participate in this study and your choice will not be held against you. If you would like to withdraw from the Research Project at any stage, please feel comfortable to inform me as such. If you have any further queries, comments, suggestions or want any more information about this Research Project, please contact:

Dr R. Ahmed: Tel (w) 021 9373115, Fax: 021 931 2287 or E-mail: rahmed@uwc.ac.za.

Thanking you in anticipation.

Dr R. Ahmed



IF YOU WANT TO WILLINGLY PARTICIPATE IN THIS RESEARCH PROJECT,
Please complete and sign the form below and return to the Researcher.
Alternatively, e-mail the completed form to the above e-mail address.

I agree to participate in this Research Project:

Name: _____

Address: _____

Tel Number: _____

Cell Number: _____

Fax Number: _____

E – Mail: _____

Signature: _____

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SOCIO DEMOGRAPHIC AND EXPECTATION QUESTIONNAIRE

(Where applicable mark your answer with an X)

1. Age: >40 40-55 yr 56-65 65yr Gender: M F

2. Race: Black White Coloure Indian Other

3. Education: Primary Secondar Tertiary No Other
Education

4. Employment: Employed
 Self-employed
 Unemployed
 Pensioner

5. Monthly Income: Category 1: R0-
 Category 2: R3500-
 Category 3: > R8500
 State Pensioner
 Other

6. Previous denture Experience: Never worn dentures before
 Less than 5 year experience
 More than 5 years' experience

Please answer the following questions regarding expectations you may have with your dentures constructed at the Prosthetic Clinic at UWC

Patient Expectations Questionnaire

1.	Do you expect to have difficulty chewing because of problems with your dentures?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
2	Do you expect to have food catching underneath your dentures?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
3	Do you expect to avoid eating some foods because of problems with your new dentures?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
4	Do you expect your diet to change/ be unsatisfactory because of problems with your new dentures?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
5	Do you expect that you will be unable to eat with your new dentures?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
6	Do you expect to interrupt your meals because of problems with your new dentures?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
7	Do you expect to pain in your mouth as a result of your new dentures?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
8	Do you expect to have sore spots/ ulcers in your mouth because of your dentures?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
9	Do you expect your new dentures to be uncomfortable? (if not applicable, please mark Never	Very often	Fairly Often	Occasionally	Hardly Ever	Never
10	Do you expect to be self-conscious because of problems with your dentures?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
11	Do you expect your dentures to fit retentively/ properly?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
12	Do you expect your dentures to affect your Quality of Life?	Very often	Fairly Often	Occasionally	Hardly Ever	Never
13	Do you expect you will be satisfied with your new dentures?	Very often	Fairly Often	Occasionally	Hardly Ever	Never

Oral Health Impact Profile

Please answer the following questions regarding the following problems that you may have had with your teeth during the last three months.

DURING THE LAST THREE MONTHS, HOW OFTEN...

1.	Have you had difficulty chewing because of problems with your teeth/ dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
2.	Have you had food catching in your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
3.	Have you felt that your dentures have not been fitting properly?	Very often	Fairly often	Occasionally	Hardly ever	Never
4.	Have you had painful aching in your mouth?	Very often	Fairly often	Occasionally	Hardly ever	Never
5.	Have you found it uncomfortable to eat some foods because of problems with your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
6.	Have you had sore spots in your mouth	Very often	Fairly often	Occasionally	Hardly ever	Never
7.	Have your dentures been uncomfortable? (if not applicable, please mark Never)	Very often	Fairly often	Occasionally	Hardly ever	Never
8.	Have you been worried by dental problems	Very often	Fairly often	Occasionally	Hardly ever	Never
9.	Have you been self-conscious because of problems with your teeth or dentures	Very often	Fairly often	Occasionally	Hardly ever	Never
10.	Have you avoided eating some foods because of problems with your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
11.	Has your diet been unsatisfactory because of problems with your teeth, mouth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
12.	Have you been unable to eat with your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
13.	Have you had to interrupt meals because of problems with your teeth or dentures	Very often	Fairly often	Occasionally	Hardly ever	Never
14.	Have you been upset because of problems with your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
15.	Have you been embarrassed because of problems with your teeth or dentures	Very often	Fairly often	Occasionally	Hardly ever	Never
16.	Have you avoided going out because of problems with your teeth or dentures	Very often	Fairly often	Occasionally	Hardly ever	Never
17.	Have you been less tolerant of your spouse or family because of problems with your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
18.	Have you been irritable because of problems with your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
19.	Have you been unable to enjoy other people's company because of problems with your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never
20.	Have you found life less satisfying because of problems with your teeth or dentures?	Very often	Fairly often	Occasionally	Hardly ever	Never



**Office of the Deputy Dean
Postgraduate Studies and Research**
Faculty of Dentistry & WHO Collaborating Centre for Oral Health



UNIVERSITY OF THE WESTERN CAPE
Private Bag X1, Tygerberg 7505
Cape Town
SOUTH AFRICA

Date: 30th August 2013

For Attention: Dr R Ahmed
Restorative Dentistry

Dear Dr Ahmed

STUDY PROJECT: Does patient expectation influence satisfaction with complete dentures constructed by undergraduate dental students?

PROJECT REGISTRATION NUMBER: 13/7/16

ETHICS: Approved

At a meeting of the Senate Research Committee held on Friday 30th August 2013 the above project was approved. This project is therefore now registered and you can proceed with the study. Please quote the above-mentioned project title and registration number in all further correspondence. Please carefully read the Standards and Guidance for Researchers below before carrying out your study.

Patients participating in a research project at the Tygerberg and Mitchells Plain Oral Health Centres will not be treated free of charge as the Provincial Administration of the Western Cape does not support research financially.

Due to the heavy workload auxiliary staff of the Oral Health Centres cannot offer assistance with research projects.

Yours sincerely

Professor Sudeshni Naidoo

Raw Data -Frequency Demographic details

Student Year

	Frequency	Percent	Valid Percent	Cumulative Percent
IV_th Year	68	75.6	75.6	75.6
Valid V_th year	22	24.4	24.4	100.0
Total	90	100.0	100.0	

Age

	Frequency	Percent	Valid Percent	Cumulative Percent
40-55 yrs	20	22.2	22.2	22.2
Valid 56-65 yrs	41	45.6	45.6	67.8
65+ yrs	29	32.2	32.2	100.0
Total	90	100.0	100.0	

Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Male	25	27.8	27.8	27.8
Valid Female	65	72.2	72.2	100.0
Total	90	100.0	100.0	

Race

	Frequency	Percent	Valid Percent	Cumulative Percent
Black	2	2.2	2.2	2.2
White	7	7.8	7.8	10.0
Valid Coloured	77	85.6	85.6	95.6
Indian	4	4.4	4.4	100.0
Total	90	100.0	100.0	

Education

	Frequency	Percent	Valid Percent	Cumulative Percent
Primary	17	18.9	18.9	18.9
Secondary	67	74.4	74.4	93.3
Valid Tertiary	2	2.2	2.2	95.6
No education	4	4.4	4.4	100.0
Total	90	100.0	100.0	

Employment

	Frequency	Percent	Valid Percent	Cumulative Percent
Employed	3	3.3	3.3	3.3
Self-employed	2	2.2	2.2	5.6
Valid Unemployed	32	35.6	35.6	41.1
Pensioner	53	58.9	58.9	100.0
Total	90	100.0	100.0	

Monthly Income

	Frequency	Percent	Valid Percent	Cumulative Percent
R0 - R3500	16	17.8	17.8	17.8
R3501 - R8500	3	3.3	3.3	21.1
Valid State Pensioner	50	55.6	55.6	76.7
Other	21	23.3	23.3	100.0
Total	90	100.0	100.0	

Previous denture experience

	Frequency	Percent	Valid Percent	Cumulative Percent
Never wore dentures before	13	14.4	14.4	14.4
Less than 5 years experience	1	1.1	1.1	15.6
Valid More than 5 years experience	76	84.4	84.4	100.0
Total	90	100.0	100.0	

Descriptive Stats- PEQ

	Count	Minimum	Maximum	Median	Mean	Standard Deviation
Q01 Do you expect to have difficulty chewing because of problems with your dentures	90	1	5	4	3.8	1.3
Q2 Do you expect to have food catching underneath your dentures	90	1	5	4	3.9	1.1
Q3 Do you expect to avoid eating some foods because of problems with your new dentures	90	2	5	4	4.0	1.1
Q4 Do you expect your diet to change/be unsatisfactory because of problems with your new dentures	90	1	5	5	4.0	1.1
Q5 Do you expect that you will be unable to eat with your new dentures	90	1	5	5	4.1	1.1
Q6 Do you expect to interrupt your meals because of problems with your new dentures	90	1	5	5	4.2	1.0
Q7 Do you expect to have pain in your mouth as a result of your new dentures	90	1	5	4	3.8	1.2
Q8 Do you expect to have sore spots/ulcers in your mouth because of your dentures	90	1	5	4	3.9	1.1
Q9 Do you expect your new dentures to be uncomfortable	90	1	5	5	4.0	1.2
Q10 Do you expect to be self-conscious because of problems with your dentures	90	1	5	3	3.1	1.7
Q11 Do you expect your dentures to NOT fit rententively/properly	90	1	5	5	4.6	1.0
Q12 Do you expect your dentures to NOT affect your Quality of Life	90	1	5	5	4.8	.7
Q13 Do you expect you will be NOT satisfied with your new dentures	90	3	5	5	4.9	.4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Q7.01 Do you expect to have difficulty chewing because of problems with your dentures	49.31	44.734	.603	.734
Q7.02 Do you expect to have food catching underneath your dentures	49.22	46.287	.582	.739
Q7.03 Do you expect to avoid eating some foods because of problems with your new dentures	49.18	46.328	.612	.737
Q7.04 Do you expect your diet to change/be unsatisfactory because of problems with your new dentures	49.11	45.898	.629	.734
Q7.B1 Do you expect that you will be unable to eat with your new dentures	49.03	48.033	.508	.748
Q7.05 Do you expect to interrupt your meals because of problems with your new dentures	48.99	48.618	.482	.750
Q7.B2 Do you expect to have pain in your mouth as a result of your new dentures	49.38	47.339	.481	.749
Q7.06 Do you expect to have sore spots/ulcers in your mouth because of your dentures	49.23	47.484	.496	.748
Q7.07 Do you expect your new dentures to be uncomfortable	49.16	51.234	.223	.777
Q7.08 Do you expect to be self-conscious because of problems with your dentures	50.08	48.342	.223	.791
Q7.13_r Do you expect your dentures to NOT fit retentively/properly	48.59	53.144	.174	.777
Q7.14_r Do you expect your dentures to NOT affect your Quality of Life	48.33	56.067	.007	.784
Q7.15_r Do you expect you will be NOT satisfied with your new dentures	48.26	55.383	.198	.774

Cronbach's Alpha		N of Items			
.773		13			
	Mean	Std. Deviation	N		
Q1 Do you expect to have difficulty chewing because of problems with your dentures	3.84	1.271	90		
Q2 Do you expect to have food catching underneath your dentures	3.93	1.140	90		
Q3 Do you expect to avoid eating some foods because of problems with your new dentures	3.98	1.091	90		
Q4 Do you expect your diet to change/be unsatisfactory because of problems with your new dentures	4.04	1.111	90		
Q5 Do you expect that you will be unable to eat with your new dentures	4.12	1.058	90		
Q6 Do you expect to interrupt your meals because of problems with your new dentures	4.17	1.030	90		
Q7 Do you expect to have pain in your mouth as a result of your new dentures	3.78	1.188	90		
Q8 Do you expect to have sore spots/ulcers in your mouth because of your dentures	3.92	1.144	90		
Q9 Do you expect your new dentures to be uncomfortable	4.00	1.218	90		
Q10 Do you expect to be self-conscious because of problems with your dentures	3.08	1.717	90		
Q11 Do you expect your dentures to NOT fit retentively/properly	4.57	.984	90		
Q12 Do you expect your dentures to NOT affect your Quality of Life	4.82	.680	90		
Q13 Do you expect you will be NOT satisfied with your new dentures	4.90	.369	90		

Descriptives Stats- OHIP-20

	Count	Minimum	Maximum	Median	Mean	Standard Deviation
Q1 Have you had difficulty chewing because of problems with your teeth/dentures	90	1	5	3	2.9	1.3
Q2 Have you had food catching underneath in your teeth or dentures	90	1	5	3	2.9	1.3
Q3 Have you felt that your dentures have not been fitting properly	90	1	5	3	3.1	1.5
Q4 Have you been worried by dental problems	90	1	5	3	2.9	1.3
Q5 Have you found it uncomfortable to eat some foods because of problems with your teeth or dentures	90	1	5	3	3.0	1.3
Q6 Have you had sore spots in your mouth	90	1	5	3	3.0	1.4
Q7 Have your dentures been uncomfortable	90	1	5	3	3.2	1.4
Q8 Have you been worried by dental problems	90	1	5	3	3.2	1.2
Q9 Have you been self-conscious because of problems with your teeth or dentures	90	1	5	3	3.4	1.3
Q10 Have you avoided eating some foods because of problems with your teeth or dentures	90	1	5	4	3.4	1.3
Q11 Has your diet been unsatisfactory because of problems with your teeth, mouth or dentures	90	1	5	4	3.4	1.3

Q12 Have you been unable to eat with your teeth or dentures	90	1	5	4	3.4	1.4
Q13 Have you had to interrupt meals because of problems with your teeth or dentures	90	1	5	3	3.4	1.4
Q14 Have you been upset because of problems with your teeth or dentures	90	1	5	4	3.7	1.3
Q15 Have you been embarrassed because of problems with your teeth or dentures	90	1	5	4	3.9	1.1
Q16 Have you avoided going out because of problems with your teeth or dentures	90	2	5	5	4.4	.9
Q17 Have you been less tolerant of your spouse or family because of problems with your teeth or dentures	90	1	5	5	4.5	.9
Q18 Have you been irritable because of problems with your teeth or dentures	90	1	5	5	4.3	1.1
Q19 Have you been unable to enjoy other people's company because of problems with your teeth or dentures	90	1	5	5	4.4	1.0
Q20 Have you found life less satisfying because of problems with your teeth or dentures	90	1	5	4	3.9	1.0

Correlations: Expectations x Satisfaction

Correlations

		Satisfaction Scale_t (total score) [20 - 100]	Expectations Scale_t - (total score) [13 - 65]	Expectations Scale_tm - Masticatory - total score	Expectations Scale_tp - Pain - total score
Satisfaction Scale_t (total score) [20 - 100]	Pearson Correlation	1	.112	.092	..141
	Sig. (2-tailed)		.295	.389	.186
	N	90	90	90	90
Expectations Scale_t - (total score) [13 - 65]	Pearson Correlation	..112	1	.873	..635
	Sig. (2-tailed)	.295		.000	.000
	N	90	90	90	90
Expectations Scale_tm - Masticatory - total score	Pearson Correlation	.092	.873	1	..342
	Sig. (2-tailed)	.389	.000		.001
	N	90	90	90	90
Expectations Scale_tp - Pain - total score	Pearson Correlation	.141	.635	..342	1
	Sig. (2-tailed)	.186	.000	.001	
	N	90	90	90	90

University of the Western Cape
Division of Postgraduate Studies

Appendix A: Memorandum of Understanding between the Supervisor and the Postgraduate Student¹

The supervisor	The student	I confirm that I have read and understood this Memorandum of Understanding and agree to use it as a guide.
<ul style="list-style-type: none"> Promotes the successful completion of research-based masters and doctoral programmes within the required time period and the production of high quality output. Fosters the development of the postgraduate student as an independent professional researcher, helping him/her to achieve excellent research skills and general transferable skills that will equip him/her to make a continuing and valuable contribution to his/her field of study and to society. Provides the necessary academic guidance and support throughout all stages of the research and writing. Assists the masters student to demonstrate his/her ability to competently handle a substantial 	<ul style="list-style-type: none"> Takes principal responsibility for conducting an individual research project leading to a degree and strives to achieve completion within the regulated period of time prescribed by the University. Exercises critical and independent thought in the design and execution of his/her research and attends workshops and seminars organized by the Division for Postgraduate Studies designed to support postgraduate study. Abides by the rules of the University and takes responsibility for ensuring that all administrative procedures pertaining to registration, the payment of fees, and other regulations governing his/her enrolment are completed timeously. Respects all ethical and legal issues in the execution of his/her research, including seeking ethical clearance through the 	<p>Name of student: <u>Rukshana Ahmed</u></p> <p>Student registration number: <u>2563534</u></p> <p>Name of supervisor: <u>Dr S. Khan</u></p> <p>Name of co-supervisor (if app): <u>Prof A. Beerts</u></p> <p>The broad area of study is: <u>patient satisfaction with dentures constructed by students</u></p> <p>Provisional submission date is: <u>October 2015</u></p> <p>Degree: <u>MSc</u> Dept: <u>Resorative dentistry</u></p> <p>Faculty: <u>Dentistry</u></p>

¹ Adapted from "Principles for Postgraduate Supervision", University of the Witwatersrand. Available at www.wits.ac.za

ABSTRACT IADR 2015

Objective

To determine the expectations of edentulous patients wanting new complete dentures (CDs) constructed by undergraduate dental students

Methods

A convenience sample of edentulous patients (n = 100) agreed to participate in this study. A consent form was prepared and completed by each participant. The undergraduate dental student constructed the CDs. These patients completed a questionnaire reflecting on their expectations with CDs, including some demographic data. The series of 13-questions (modified from the OHIP-20 EDENT) and with responses based on a Likert-type format was used to address the objectives of the study.

Results

Forty five percent of participants were between 56-65 years, with 72% being female. With regards to education, 74% had some secondary and 2 % tertiary education. Majority (84%) were pensioners and had more than five year's denture experience (84%). The expectation questions were statistically validated with the Cronbach's Alpha (.773) indicating a good reliability.

With regards to functioning with CDs, 59 % indicated that they never or hardly ever expect to encounter difficulty with chewing, 60% have food catching underneath the denture, whilst 87 % did not expect their dentures not to fit properly. With regards to denture pain, 50 % expected to experience pain, whilst 56.7 % did not expect spots or ulcer in their mouths with new CDs. Comfort was regarded positively with 64.4 % felt that their new CDs would never/ hardly ever be uncomfortable and 55% indicated they would be self-conscious due to problems with CDs.

Conclusion

It can be concluded that edentulous patients have expectations regarding sufficient masticatory ability and pain experienced with new CDs.



Expectations and the Edentulous Patient

R Ahmed, S Khan

Department of Restorative Dentistry,
University of the Western Cape, Cape Town, South Africa



Introduction

Edentulism is not life threatening, but it has tremendous impact on the functional and social aspects of the individual's life. Conventional Complete Removable Dentures (CRDs) are the most cost-effective treatment option for treating completely edentulous patients compared to other advanced treatment modalities. The patient's pre-treatment expectations can affect treatment outcomes and as such treatment failures can be the result of misinterpretation of perceptions and expectations of the patient. These expectations vary in individuals and can be influenced by age, gender, levels of education, and the need for the dentures to be like natural teeth is the most important.

Objective

To determine the expectations of completely edentulous patients wanting new complete removable dentures constructed by undergraduate dental students.

Method

A convenience sample of completely edentulous patients (N=100) agreed to participate in this study. The CRDs were constructed by undergraduate fourth and fifth year dental students. The included patients completed a questionnaire reflecting on their expectations of their new CRDs, including some demographic data. A series of 13-questions (modified from the OHIP-20 EDENT) and with responses based on a Likert-type format was used to address the objectives of the study (Table 1).

Table 1: Patient Expectation Questionnaire

Q.No	Question	Very Often	Fairly Often	Occasionally	Hardly ever	Never
1	Do you expect to have difficulty chewing because of problems with your dentures?					
2	Do you expect to have food catching underneath your dentures?					
3	Do you expect to avoid eating some foods because of problems with your new dentures?					
4	Do you expect your diet to change/be unsatisfactory because of problems with your new dentures?					
5	Do you expect that you will be unable to eat with your new dentures?					
6	Do you expect to interrupt your meals because of problems with your new dentures?					
7	Do you expect the pain in your mouth as a result of your new dentures?					
8	Do you expect to have sore spots/ulcers in your mouth because of your dentures?					
9	Do you expect your new dentures to be uncomfortable? (if not applicable, please mark NEVER)					
10	Do you expect to be self-conscious because of problems with your dentures?					
11	Do you expect your dentures to fit retentively / properly?					
12	Do you expect your dentures to affect your quality of life?					
13	Do you expect you will be satisfied with your new dentures?					

Results

Consent was obtained from each participant. The Patient Expectation Questionnaire was statistically validated with the Cronbach's Alpha (.773) indicating a good reliability.

Results for the questionnaire included the following results:-

Questions relating to functional limitations

- ❖ Majority of the sample (59 %) indicated they never expected to encounter difficulty with chewing food or have food catching underneath their new dentures.
- ❖ A large portion of the sample (87%) did not expect their CRDs not to fit properly.

Questions relating to Physical Pain

- ❖ Half of the sample (50%) expected to experience pain as a results of the new CRDs.
- ❖ Majority of the sample (56%) did not expect any sore spots or ulcers as a result of their new CRDs.

In addition more than two thirds (64%) of the sample felt that their new CRDs would never be uncomfortable and 55% indicated they would be self-conscious due to problems with CRDs.

The demographic data collected in this study yielded the following results:

- ❖ More than half of the sample was pensioners (58%), with the majority being female.
- ❖ Largest part of the sample (74%) had some secondary school education.
- ❖ Majority of the sample (85.6%) was of coloured ethnicity in the age group 56- 65 years of age.

Conclusions

Edentulous patients have expectations regarding sufficient masticatory ability and pain experienced with new CRDs.

References are available on request