The Impact of New Complete Dentures on Oral Health-related Quality of Life

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SUMMARY

Objective: To investigate the relationship between complete dentures and oral health-related quality of life (OHRQoL).
Method: Seventy-six patients were conveniently selected from the waiting list for complete dentures. At the first visit (pre-treatment) the patients were interviewed using the Oral Health Impact Profile for Edentulous Patients (OHIP-EDENT). Sixty-three of these patients were interviewed telephonically 2 to 3 months after receiving their new complete dentures (post-treatment).
Results: Mean domain scores were significantly lower post-treatment for psychological discomfort and disability, social disability and handicap.
Conclusion: This study shows that after the provision of a new set of complete dentures the OHRQoL of patients improved significantly on four of the seven domains for the first 2 to 3 months post-insertion.
Key words: complete dentures; oral health; quality of life

INTRODUCTION

The World Health Organization (WHO) defines health as a state of complete physical, mental and social well-being, not merely the absence of disease or infirmity[1]. Traditionally, clinical outcomes have been used in oral health research[2]. More recently, the importance of psychosocial variables like patient satisfaction and oral health-related quality of life (OHRQoL) has been recognised[3]. These patient-based outcomes are now also used to screen for dental care needs and measure the impact of dental treatment[4]. Edentulousness is a worldwide phenomenon[5]. In many developing countries access to oral health services is limited and teeth are often left untreated or are extracted. While in some industrialized countries there is a reduction in tooth loss among adults, in other countries the proportion of edentulous adults aged 65 years and older is still high[5]. A national survey in South Africa showed the national prevalence of edentulousness to be 13,5% for age group 15+ years and 29% for age group 65+ years[6]. The Western Cape Province had the highest rate of edentulousness, with a prevalence of 33% among those over the age of 15 years. Loss of natural teeth is a serious life event that can result in functional disability[7-8]. Tooth loss also has an impact on psychosocial behaviour such as self-confidence and participation in social activities[7-15]. Subjects with considerable tooth loss without recourse to a denture are among those with the poorest OHRQoL[15]. For edentulous denture wearers, replacing existing conventional dentures has been shown to either have no influence[16] or a positive influence on quality of life parameters[4,17]. Studies assessing the impact of prosthetic treatment on OHRQoL have shown that subjects who received conventional dentures improved in the physical pain and psychological discomfort domains only, while subjects who received implant-supported dentures improved in all the domains of the Oral Health Impact Profile (OHIP)[18-20]. Implant-supported dentures, however, are beyond the financial means of most people globally. Using a cross-sectional analytical study design, this study assessed changes in OHRQoL in patients who received a new set of complete dentures. The use of the OHIP-EDENT has not been reported previously in South Africa.

The Oral Health Impact Profile (OHIP) is a 49-item profile that describes the impacts of oral health conditions on aspects of function, daily living and social interactions in seven domains, including functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap[21]. The OHIP constituted 49 lengthy questions and partly for this reason there was a need to develop a shorter derivative, the OHIP-14[22]. The OHIP–14 proved to have good statistical properties and validity[22] . The benefit of using the OHIP-14 is that data can be collected using less fieldwork and respondent burden. However, statements relevant to denture-wearing were excluded in the OHIP–14. Allen and Locker[23] found that improvements following clinical intervention could not be measured and that the shortened version did not include an item related to perceived chewing difficulty - a common problem for patients wearing removable dentures. As a result another shortened version of the OHIP was developed to be used in the prosthodontic setting, namely the Oral Health Impact Profile for Edentulous Patients (OHIP-EDENT)[23]. The

OHIP-EDENT consists of 19 statements derived from the OHIP using an item impact method.

The OHIP-EDENT consists of a series of statements or questions (see Table 1), belonging to the same seven domains as the OHIP. These statements must be responded to according to a Likert scale: 0 = never, 1 = hardly ever, 2 = occasionally, 3 = fairly often and 4 = very often. Lower scores represent a better OHRQoL. This study used the OHIP-EDENT to measure treatment outcomes because the population group is exclusively edentulous, reliability and validity of the instrument has been proven elsewhere, cross-cultural consistency of the instrument has been reported and the instrument is short and encompasses all issues affecting edentulous patients[24]. The objectives of the study were to investigate the relationships between gender, age and socio-economic status and oral health-related quality of life, and the relationship between oral health-related quality of life and complete dentures.

MATERIALS AND METHODS

A sample of 76 edentulous denture-wearing patients requiring new conventional complete dentures, was selected from the waiting list in the prosthetic clinic in the Faculty of Dentistry at the University of the Western Cape. All patients requiring new conventional complete dentures were included in the sample. The exclusion criteria included subjects requesting and expecting implant-stabilised dentures and those patients without a contact number as the follow-up interview was conducted telephonically. The Research and Ethics Committee of the University of the Western Cape approved the protocol. Patients completed a written informed consent form and were assured of confidentiality. The participants were further assured that the research worker was not involved in their treatment and that their participation would not influence the outcome or cost of their treatment. The OHRQoL was measured using the OHIP-EDENT[23]. In addition, socio-demographic data were collected, namely, age, gender, employment status and ethnicity. The patients were interviewed at the first visit (pre-treatment) and 2 to 3 months post-treatment. The first interview was conducted in the clinical area and asked about current oral health-related quality of life. The same interviewer conducted the second interview telephonically. Thirteen patients did not participate in the second interview due to loss of contact (n=8), not wearing the new dentures (n=2), relocation (n=2) and postponement of treatment (n=1). All the analyses, therefore, are based on a sample of 63 patients. Undergraduate students under the supervision of staff, following a standard departmental treatment protocol, provided the treatment.
The five categories of response per item are: 1) never, 2) hardly ever, 3) occasionally, 4) fairly often and 5) very often. They are scored from 0 for never to 4 for very often, with lower scores representing a better OHRQOL. The coded responses for each of the items were multiplied by the corresponding Australian weightings[23] and then summed within each of the seven dimensions to give seven sub-scale scores. For example: Functional limitation = (1.253 x question 1 score) + (1.181 x question 2 score) + (1.472 x question 6 score).

For ease of interpretation, high impact frequencies (represented by codes 3 and 4), neutral impacts (represented by code 2) and low impact frequencies (represented by codes 0 and 1) were compared for each question pre- and post-treatment. Significance was assessed using the Chi-square test. The domain mean scores were also compared using the Wilcoxon Matched-Pairs Signed-Rank test. Relationships between the demographic variables and OHIP-EDENT (pre- and post-treatment) scores were explored by comparing mean scores and applying ANOVA tests. For all significance tests a p-value <0.05 was considered as statistically significant.

RESULTS

The majority of the participants were female (81%). The mean age of the participants was 58 years with an almost equal distribution above and below 60 years of age. Fifty-one percent of the sample had had secondary or tertiary education, while 49% had had no formal or only primary education. Forty-one percent of the sample were pensioners, 31% were employed and 28% were unemployed. Seventy-seven percent of the patients participating in the study reported a medical condition, the most prevalent condition being hypertension (37%). More than a quarter (27%) had been edentulous for more than 30 years, 44% for 16 to 30 years and 22% for less than 16 years.

The mean domain scores were similar by gender both at the pre- and post-treatment interviews, except psychological disability at follow-up, which was significantly higher in females (4,34 compared to 0,96). Participants aged < 60 years reported significantly higher mean domain scores than those aged > 60 years pre-treatment, except for functional limitation. At post-treatment the mean domain scores were no longer significantly different, except psychological disability (3,68 compared to ,68). At pre-treatment the domain scores were similar for those with either no or only primary school education compared to those with secondary and tertiary education. At post-treatment those with higher education reported higher scores for functional limitation and physical disability. At pre-treatment employed persons reported higher mean domain scores compared to pensioners and unemployed persons. At post-treatment these differences were no longer significant. Table 1 compares the percentage frequency distribution of impacts pre- and post-treatment. The items with high impact pre-treatment included difficulty chewing foods and avoiding some foods, dentures not fitting properly, uncomfortable to eat with the dentures and being self-conscious. The items that occurred substantially less often post-treatment included being self-conscious because of teeth, mouth or dentures, being worried about dental problems, avoiding certain foods, and being upset or embarrassed because of problems with teeth, mouth or dentures. The impact of a few items was greater post-treatment, such as sore spots in the mouth and uncom-

Table 1: Percentage frequency distributions of impacts pre-treatment and post-treatment							
Domain	OHIP-EDENT Questions	Pre-tratment			Post-treatment		
		Low impact	Neutral impact	High impact	Low impact	Neutral impact	High impact
FL	Difficulty chewing any foods?	32	14	54	38	10	52
FL	Food catching in your dentures?	49	19	32	51	16	33
FL	Dentures not fitting properly?	57	9	33	59	3	38
P1	Painful aching in your mouth?	59	18	24	62	8	30
P1	Uncomfortable to eat any foods?	38	21	41	49	11	40
P1	Sore spots in your mouth?	65	16	19	57	13	30
P1	Uncomfortable dentures?	62	16	22	56	8	37
P2	Worried by dental problems?	52	16	32	71	5	24
P2	Self-conscious?	44	11	44	73	11	16
D1	Avoid eating some foods?	35	19	46	52	13	35
D1	Unable to eat?	68	13	19	57	13	30
D1	Interrupt meals?	52	16	32	62	8	30
D2	Upset?	52	16	32	67	13	21
D2	A bit embarrassed?	60	13	27	81	3	16
D3	Avoided going out?	68	10	22	87	2	11
D3	Less tolerant of partner or family?	79	5	16	89	2	10
D3	Irritable with other people?	76	10	14	89	3	8
H	Unable to enjoy other peoples company as much?	73	14	13	92	2	6
H	Felt that life in general was less satisfying?	70	14	16	87	2	11

FL=Functional limitation, P1=Physical pain, P2=Psychological discomfort, D1=Physical disability, D2=Psychological disability, D3=Social disability and H=Handicap. Low impact = never or hardly ever (score 0 and 1); Neutral = occasionally (score 2); High impact = fairly often or very often (score 3 and 4)

Table 2: Comparison of mean OHIP-EDENT domain scores pre- and post-treatment			
Domains	Mean score pre-treatment	Mean score post-treatment	p-value*
Functional limitation	7.28	6.94	0.828
Physical pain	6.16	7.27	0.438
Psychological discomfort	6.65	3.70	0.002
Physical disability	5.51	5.55	0.979
Psychological disability	3.94	2.57	0.029
Social disability	5.33	2.54	0.011
Handicap	2.57	1.09	0.013

* Wilcoxon Matched-Pairs Signed-Rank test

fortable dentures. Table 2 compares the mean domain scores pre- and post-treatment. At pre-treatment the domains most impacted were functional limitation, physical pain and psychological discomfort. At post-treatment functional limitation and physical pain remained the most impacted domains. The domains that scored significantly lower post-treatment were psychological discomfort and disability, social disability and handicap. Physical pain and disability scored slightly higher at the follow-up interview. The handicap domain scored low pre- and post-treatment.

DISCUSSION

This is the first study providing data about OHRQoL in edentulous patients seeking prosthodontic treatment and receiving conventional complete dentures in South Africa. Statistically significant improvements were observed in the psychological discomfort, psychological disability, social disability and handicap domains. Improvements in these domains suggest that patients were significantly less worried, upset, embarrassed and self-conscious about their oral/denture problems post-treatment. The quality of the subjects' social life improved as indicated by an improved social disability and handicap score, with patients more outgoing, less irritable and edgy with family and friends, and in general enjoying life more. The lowest scores were recorded in the psychological and social disability and handicap domains both at baseline and post-treatment (Table 2). The "real-life" implications of these impacts, therefore, may be negligible. The low impacts of these domains may be explained by the fact that the majority of these patients had had previous denture experience, had probably adapted to being edentulous and were more familiar with what to expect regarding a new complete denture. The low impact scores may also be explained due to the high prevalence of edentulism and people becoming edentulous at a relatively young age in the Western Cape. Edentulism and denture wearing might be seen as part of the normal course of life and be more psychologically and socially acceptable compared to other regions or parts in the world. There was no improvement in the physical pain and physical disability scores. This may be attributed to the presence of pressure spots and pain routinely associated with new dentures. It can be speculated that minor changes in individual scores continue to take place after 2 to 3 months, for example, lower impacts in the physical pain domain may be expected as post-insertion complications are resolved and patients continue their adaptation process. Post-insertion problems were not recorded for the purpose of this study. A longer follow-up period than the 2 to 3 months may be necessary to assess further developments in these two domains. At pre-treatment, younger people (<60 years) reported higher impacts than older people in all domains except for functional limitation. This suggests that problems with dentures negatively affect the quality of life of younger people more

than that of older people, although younger people seem to cope better with the functional limitations of problematic dentures.

It must be kept in mind that external validity for this study was based on the widespread use of the OHIP-EDENT in other parts of the world and its proven good cross-cultural reliability. However, no internal validity was assessed in this study and should be accepted as a limitation of the study. Providing complete dentures to the many edentulous people in the Western Cape would improve their OHRQoL significantly in respect of four of the seven domains of the OHIP-EDENT. However, for many the costs of purchasing complete dentures in the private sector is difficult as the majority of the population is not covered by medical insurance[25] and/or is poor[26].

The public sector, therefore, needs to play a significantly more important role in providing this type of care. Research, however, suggests that in the last 10 years the number of complete dentures provided by the public dental sector in the Western Cape has decreased by 80%, from 1605 units in 1994 to 261 in 2003. (Personal communication, Dr R Barrie). The prevention of oral diseases, however, must be prioritised to avoid the future problems of edentulousness.

In summary, this study shows that significant improvements were recorded in more than half of the domains of the OHIP-EDENT 2 to 3 months post-insertion. Therefore, it can be concluded that new complete dentures can improve the OHRQoL of patients. These results are relevant for clinicians in drawing on evidence about the potential benefits of prosthetic treatment when counseling patients about their expectations on oral function, social and psychological comfort.

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REFERENCES

1. World Health Organization. Constitution of the WHO. Geneva: World Health Organization, 1948.
2. Locker D, Jokovic A. Using subjective oral health status indicators to screen for dental care needs in older adults. *Community Dent Oral Epidemiol* 1996; **24**: 398-402.
3. Awad MA, Feine JS. Measuring patient satisfaction with mandibular prostheses. Comm Dent Oral Epidemiol 1998; 26: 400-405.
4. Veyrune JL, Tubert-Jeannin S, Dutheil C, Riordan PJ. Impact of new prostheses on the oral health related quality of life of edentulous patients. *Gerodontology 2005;* **22**: 3-9.
5. World Health Organization. The World Oral Health Report 2003. Geneva: World Health Organization, 2002; p4-5.
6. Naidoo S, Chikte UM, Moola H, Steyn K. Perceptions of oral health: the South African Demographic and Health Survey of 1998. *SADJ* 2001; **56**: 505-510.
7. Bergendal B. The relative importance of tooth loss and denture wearing in Swedish adults. *Comm Dent Health* 1989; **6**: 103-111.
8. Allen PF, McMillan AS. The impact of tooth loss in a denture wearing population: an assessment using the Oral Health Impact Profile. *Comm Dent Health* 1999; **16**: 176-180.
9. Allen PF, McMillan AS, Walshaw D. A patient-based assessment of implant-stabilized and conventional complete dentures. *J Prosthet Dent* 2001; **85**: 141-147.
10. Fiske J, Davis DM, Frances C, Gelbier S. The emotional effects of tooth loss in edentulous people. *Br Dent J* 1998; **184**: 90-93.
11. Davis DM, Fiske J, Scott B, Radford DR. The emotional effects of tooth loss: a preliminary quantitative study. *Br Dent J* 2000; **188**: 503-506.
12. Fiske J, Davis DM, Leung KC, McMillan AS, Scott BJ. The emotional effects of tooth loss in partially dentate people attending prosthodontic clinics in dental schools in England, Scotland and Hong Kong: a preliminary investigation. *Int Dent J* 2001; **51**: 457-462.
13. Scott BJ, Leung KC, McMillan AS, Davis DM, Fiske J. A transcultural perspective on the emotional effect of tooth loss in complete denture wearers. *Int J Prosthodont* 2001; **14**: 461-465.
14. John MT, LeResche L, Koepsell TD, Hujoel P, Miglioretti DL, Micheelis W. Oral health-related quality of life in Germany. *Eur J Oral Sci* 2003; **111**: 483-491.
15. McGrath C, Bedi R. Can dentures improve the quality of life of those who have experienced considerable tooth loss? *J Dent* 2001; **29**: 243-246.
16. Forgie AH, Scott BJ, Davis DM. A study to compare the oral health impact profile and satisfaction before and after having replacement complete dentures in England and Scotland. *Gerodontology* 2005; **22**:137-142.
17. Allen PF, McMillan AS, Locker D. An assessment of sensitivity to change of the Oral Health Impact Profile in a clinical trial. *Community Dent Oral Epidemiol* 2001; **29**: 175-182.
18. Awad MA, Locker D, Korner-Bitensky N, Feine JS. Measuring the effect of intra-oral implant rehabilitation on health-related quality of life in a randomized controlled clinical trial. *J Dent Res* 2000; 79: 1659-1663.
19. Awad MA, Lund JP, Shapiro SH, Locker D, Klemetti E, Chehade A, Savard A, Feine JS. Oral health status and treatment satisfaction with mandibular implant overdentures and conventional dentures: a randomized clinical trial in a senior population. *Int J Prosthodont* 2003; **16**: 390-396.

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