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# Impact of oral health on the life quality of periodontal patients

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#### Abstract

**Objectives:** To assess the impact of oral health on the life quality of a periodontal patient group.

**Materials and Methods:** Two hundred and five patients attending a private periodontal clinic completed a questionnaire incorporating the16-item UK oral health-related quality-of-life measure (OHQoL-UK<sup>©</sup>), a check list of questions about their periodontal health over the past year and a comprehensive periodontal examination. **Results:** The effect of oral health on quality of life was considerable, with many individuals experiencing negative impacts across a broad range of physical, social and psychological aspects of life quality. OHQoL-UK<sup>©</sup> scores was associated with patient's self-reported periodontal health in the past year: experiences of ''swollen gums'' (p < 0.01), ''sore gums'' (p < 0.01), ''receding gums'' (p < 0.01), ''loose teeth'' (p < 0.01), ''drifting teeth'' (p < 0.01), ''bad breath'' (p < 0.01) and ''toothache'' (p < 0.01). In addition, OHQoL-UK<sup>©</sup> scores were correlated with the number of teeth with pocket depths of 5 mm or more ( $r_s - 0.42$ , p < 0.01). New patients had poorer oral health-related quality of life compared with the treated maintenance group (p < 0.01).

**Conclusions:** Periodontal status impacts on life quality. This has implications in understanding the consequences of periodontal health and in the use of patient-centred outcomes in periodontal research.

## lan Needleman<sup>1</sup>, Colman McGrath<sup>2</sup>, Peter Floyd<sup>3</sup> and Amanda Biddle<sup>3</sup>

<sup>1</sup>International Centre for Evidence-Based Periodontal Health (ICEPH), Department of Periodontology, Eastman Dental Institute, University College London (UCL), London, UK; <sup>2</sup>Department of Periodontology and Public Health, Faculty of Dentistry, Prince Philip Dental Hospital, University of Hong Kong, China; <sup>3</sup>Department of Periodontology, GKT Dental Institute, KCL, London, UK

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For decades, the importance of and need for periodontal care has largely been attributed to the high prevalence of periodontal disease in most societies. National clinical oral epidemiological studies from developed countries have repeatedly estimated that over 90% of the general population have some form of periodontal disease (Morris et al. 2001, Borrell et al. 2002). In addition, it has been reported that between 10% and 20% of the population in most countries have severe forms of periodontal disease (Albandar et al. 1999, Hugoson & Laurell 2000). However, despite the dramatic improvements in other oral health states in recent decades such as dental caries, periodontal disease has remained prevalent and with little signs of improvement in the severity of the disease (Downer 1998). In recent times, the importance of periodontal care has

also focused on associations between periodontal health and general health, such as cardiovascular disease, respiratory diseases and diabetes (Hujoel et al. 2000, Scannapieco & Ho 2001, Soskolne & Klinger 2001).

The impact of periodontal disease on an individual is usually characterised by clinical parameters such as probing depth and attachment level. However, periodontal disease, through inflammation and destruction of the periodontium, produces a wide range of clinical signs and symptoms, some of which may have a considerable impact on day to day life or life quality (Locker 1988). Little is known about this aspect.

With regard to assessing outcomes of therapy, considerable debate has emerged regarding the use of traditional clinical outcomes that are in fact surrogate measures (Hujoel et al. 1997). Recent studies have begun to explore wider issues of therapy and, in particular, have begun to gather additional data in the form of patient centred outcomes (Whitehead & Watts 1987, Kalkwarf et al. 1992, Mathews & McCulloch 1993, Fardal et al. 2002, Lee et al. 2002).

Greater understanding of the consequences of periodontal disease and the effects of therapy is important on many fronts: in understanding and embracing patient perceptions of the impact of their oral health on their lives, in planning periodontal care which addresses patient needs and key concerns, in evaluating outcomes from periodontal treatment from the patient's perspective and in drawing attention to the importance of periodontal care in society (McGrath & Bedi 1999). The aim of this study was to assess the impact of oral health on the life quality of a periodontal patient group. A further aim was to determine associations between patient's self-reported periodontal status, clinical periodontal findings, treatment phase and oral health related quality of life. We attempted to answer the following research questions: "can this generic oral healthrelated quality-of-life instrument differentiate between patients with different self-reported and clinical periodontal status, and is it sensitive to the phase of periodontal care?"

#### Methods

#### Sample

Two hundred and five patients attending a private specialist periodontal practice over a 6-month period were invited to participate in the study. A sample size of at least 200 was considered appropriate to provide a confidence interval of  $\pm 5\%$  with an estimated prevalence of oral health impact on life quality of 90%.

#### Data collection

The impact of oral health on the patients' life quality was assessed using the UK oral health-related quality-of-life measure (OHQoL-UK<sup>©</sup>). This measure was developed based on the UK public's perceptions of the key areas of oral health-related quality of life (McGrath et al. 2000). The instrument's psychometric properties, validity and reliability have been assessed and reported to be good (McGrath et al. 2001). National norms data for the OHQoL-UK<sup>©</sup> measure in Britain are available (McGrath & Bedi 2002).

Employing the OHQoL-UK<sup>®</sup> measures, patients were asked to rate the impact of their oral health on 16 key areas of oral health-related quality of life: "What effect do your teeth, gums, mouth and/or prosthesis have on each of the 16 key areas of life quality (i.e. your comfort, your speech)?" Possible response categories ranged form "very bad effect" to "very good effect". In addition, patients were asked about a checklist of signs and symptoms relating to their periodontal health in the past vear: experiences of "swollen gums", "sore gums", "receding gums", "loose teeth", "drifting teeth", "bad breath" and "toothache".

Each patient then underwent a comprehensive periodontal examination as part of his or her routine assessment. The examination included assessments of medical, social and dental factors as well as traditional periodontal measures such as probing depth, attachment levels, plaque and inflammation. For the study, basic periodontal information was extracted from the assessment including number of teeth with periodontal pockets equal to or exceeding 5 mm, number of teeth present and presence of removable denture prostheses. Periodontal examinations were conducted by three experienced periodontists.

#### Data analysis

Scores were derived from response categories to each question: "very bad (score 1), bad (score 2), none (score 3), good (score 4) to very good (score 5)". Summing up responses from each of the 16 items can therefore produce overall OHQoL-UK<sup>©</sup> scores ranging from 16 (representing poorest oral health-related quality of life possible) to 80 (best oral health-related quality of life possible). Equal weights were given to each question since weighting does not improve the psychometric performance of the measure (McGrath and Bedi 2002).

Variations in mean OHQoL-UK<sup>©</sup> scores and self-reported periodontal health (signs and symptoms of perio-

dontal disease) were explored through bivariate analysis employing *t*-tests for independent samples. Association between OHQoL-UK<sup>©</sup> scores and clinical periodontal health status (number of teeth with pocket depths of 5 mm or more) was examined through correlation analysis. Data was analysed using the statistical package SPSS 11.0 (SPSS Inc., 2002).

#### Results

The impact of oral health on the life quality of the patients was considerable with substantial physical, social and psychological influences (Table 1). Many individuals perceived their oral health conditions as detracting from their physical state (i.e. reporting bad or very bad effect), affecting their comfort (19%, 39 (percentage and number of responses)) and breath odour (18%, 37), and detracting from their appearance (18%, 37). Social impacts were also prevalent, with 32% (66) reporting an effect of oral health on their finances and 16% (33) that their oral health was detracting from their smiling/laughing. Psychological influences across certain aspects were prevalent; 15% (30) claimed it worried them, 13% (27) reported that it detracted from their mood and happiness and 12% (25) reported that it detracted from their confidence.

Table 1. Perceived ways in which oral health affects quality of life

OHQoL-UK <sup>©</sup> items	Very bad effect % (number)	Bad effect % (number)	No effect % (number)	Good effect % (number)	Very good effect % (number)
Symptoms					
comfort	1 (2)	18 (37)	41 (83)	21 (43)	20 (40)
breath odour	2 (3)	16 (33)	44 (91)	22 (44)	17 (35)
Physical aspects					
eating	0 (0)	14 (28)	49 (100)	24 (49)	14 (28)
appearance	<1(1)	18 (37)	35 (72)	29 (60)	18 (37)
general health	0 (0)	7 (15)	53 (108)	25 (51)	15 (30)
speech	0 (0)	3 (6)	69 (142)	15 (30)	13 (27)
smiling or laughing	0 (0)	3 (7)	66 (135)	21 (43)	10 (20)
Psychological aspects					
relax or sleep	0 (0)	7 (15)	75 (154)	12 (25)	5 (11)
confidence	2 (3)	10 (21)	58 (119)	20 (41)	10 (21)
mood	<1(1)	12 (25)	55 (112)	25 (51)	8 (16)
carefree manner	1 (2)	14 (28)	58 (119)	21 (42)	7 (14)
personality	<1(1)	5 (10)	66 (136)	21 (42)	8 (16)
Social aspects					
work	<1(1)	2 (3)	80 (163)	14 (29)	4 (9)
social life	0 (0)	3 (7)	66 (135)	21 (43)	10 (20)
finances	5 (11)	27 (55)	59 (120)	6 (12)	3 (7)
romantic relationships	1 (2)	3 (6)	67 (138)	18 (37)	11 (23)

OHQoL-UK<sup>©</sup>, UK oral health-related quality-of-life measure.

*Table 2.* Self-reported signs and symptoms associated with periodontal disease and quality of life: discriminative validity

	OHQoL-UK <sup>©</sup> scores		
	Mean (SD)	p-Value	
Swollen gums			
yes $(n = 32)$	48.2 (8.7)	0.006	
no $(n = 175)$	53.5 (10.2)		
Sore gums			
yes $(n = 56)$	49.1 (8.7)	0.002	
no $(n = 149)$	54.0 (10.3)		
Receding gums			
yes $(n = 59)$	49.0 (8.3)	< 0.001	
no $(n = 146)$	54.2 (10.4)		
Loose teeth			
yes $(n = 40)$	46.9 (8.1)	< 0.001	
no $(n = 163)$	54.1 (10.1)		
Drifting teeth			
ves $(n = 21)$	47.3 (8.7)	0.006	
no $(n = 184)$	53.3 (10.1)		
Bad breath			
ves $(n = 32)$	48.2 (10.1)	0.006	
no $(n = 173)$	53.5 (9.9)		
Toothache			
ves $(n = 45)$	48.7 (8.7)	0.003	
no (n = 160)	53.8(10.2)	0.005	
$n_0(n - 100)$	55.6 (10.2)		

OHQoL-UK<sup>©</sup>, UK oral health-related quality-of-life measure.

Patients' oral health-related quality of life was associated with patients' selfreported periodontal state over the past year. OHQoL-UK<sup>©</sup> scores were associated with patients experiences of "swollen gums" (p < 0.01), "sore gums'' (p < 0.01), ''receding gums'' (p < 0.01), "loose teeth" (p < 0.01), "drifting teeth" (p < 0.01), "bad breath" (p < 0.01) and "toothache" (p < 0.01) in the past year (Table 2). Furthermore, patients' OHQoL-UK<sup>©</sup> scores were moderately and significantly correlated with the number of teeth with pocket depths of 5 mm or more, as recorded in the patients' records ( $r_s - 0.42$ , p < 0.01). Patients with high numbers of probing depths  $\geq$  5 mm people had a tendency to have low (poorer) OHQoL-UK<sup>©</sup> scores.

Treatment phase was also associated with patients' OHQoL-UK<sup>©</sup> scores. New patients had lower OHQoL-UK<sup>©</sup> scores, indicative of poorer oral healthrelated quality of life compared with maintenance patients (p < 0.01) (Table 3).

#### Discussion

Understanding the consequences of oral ill health from the patient's perspective has emerged as an important research area (Buck & Newton 2001). This has resulted in an increase in the use of *Table 3.* Periodontal treatment phase and quality of life: sensitivity analysis

	OHQoL-UK <sup>©</sup> scores		
	Mean (SD)	<i>p</i> -Value	
Treatment phase	47.7 (8.1)	< 0.001	
(n = 77)	47.7 (0.1)	< 0.001	
maintenance patient $(n = 128)$	55.7 (10.1)		

OHQoL-UK<sup>©</sup>, UK oral health-related quality-of-life measure.

patient-centred oral health status measures, predominately seeking to measure the impact of oral health on quality of life (Birch & Ismail 2002). These measures have been used particularly in the fields of cariology, oral rehabilitation, and to some extent in oral surgery and oral medicine, although less so in periodontology (Low et al. 1999, Award et al. 2000, Goodey et al. 2000). For their more widespread use in periodontology, it is important that they demonstrate appropriate validity and sensitivity to treatment.

The impact of oral health on the life quality of this patient group was immense; 90% (185/205) perceived that their oral health status impacted on their life quality in one or more ways. Oral health status was frequently perceived as impacting on life quality because of the symptoms and physical effects it produced. This draws attention to the influence of periodontal diseases on day to day living and overall importance to life quality. Variations in oral healthrelated quality of life in relation to selfreported signs and symptoms associated with periodontal diseases were apparent. Experiences of "swollen gums", "sore gums", "receding gums", "loose teeth", "drifting teeth", "bad breath" and "toothache" were also associated with reduced life quality. Furthermore, clinical periodontal status was also associated with oral healthrelated quality of life. Those with a greater number of deep periodontal pockets had poorer oral health-related life quality. This suggests that the generic oral health-related quality-oflife measure is sensitive to periodontal health, both self-reported and clinically observed. Discriminative ability is an important attribute of patient-centred measures if they are to play a role in understanding the consequence of periodontal disease, identifying need and in treatment planning (Weintraub 1998).

Those who had undergone a course of periodontal care and were in the maintenance phase had better oral healthrelated quality of life compared with new patients. This suggests that the measure is sensitive in discriminating between phases of periodontal care, and possibly to periodontal therapy. Sensitivity of measures to treatment is important if such measures are to be used in outcome assessment to complement existing clinical measures when evaluating periodontal care (Allen et al. 2001). Clearly, a cross-sectional study such as this can be strong in suggesting hypotheses. Demonstrating that periodontal therapy improves life quality will, however, require a longitudinal study following a patient group before and after therapy. Since including an untreated group will not be ethical, such a study will have to be uncontrolled in design.

Finally, the population studied was a highly selected one. These are patients who seek referral to a periodontal specialty practice. How these relate to wider patient groups is not known and is a limitation to the generalisability of these results. Conducting similar studies in other settings would be helpful in addressing this issue.

In conclusion, when the impact of oral health on the quality of life was assessed using the UK oral health-related qualityof-life measure, the prevalence of impact was high. The instrument demonstrated discriminative validity in identifying those with self-reported symptoms associated with periodontal diseases and those with clinical evidence of periodontal destruction. In addition, the instrument was sensitive to periodontal treatment phase. These findings have implications in the use of patient-centred outcome measures in periodontology in need assessment and evaluation of care.

#### Declaration of interests

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Addrress:

Ian Needleman

International Centre for Evidence-Based Periodontal Health (ICEPH)

Department of Periodontology

Eastman Dental Institute for Oral Health Care Sciences

University College London (UCL)

256 Gray's Inn Road

London WC1X 8LD UK

Fax: +44 20 7915 2340 E-mail: I.Needleman@eastman.ucl.ac.uk This document is a scanned copy of a printed document. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material.