Measuring the Impact of Oral Health on Quality of Life in Britain Using OHQoL-UK(W)©

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Abstract

Objectives: *This study assessed the impact of oral health on quality of life (OHQoL) in Britain and identified disparities in OHQoL among subgroups of the population.* ***Methods:*** *A national survey involved a random probability sample of 2,667 households. Participants were interviewed about their oral health status and sociodemographic information was collected. The impact of oral health on life quality was measured utilizing the OHQoL-UK(W)©.* ***Results:*** *The response rate was 68 percent. Most people in Britain (73%) claimed their oral health did affect their life quality, most frequently through physical influences rather than social or psychological. Disparities in perceived influences of oral health on life quality among subgroups of the population were apparent by age, sex, and social class; OHQoL also was influenced by oral health status (self-reported).* ***Conclusion:*** *Most Britons claim their oral health affects their life quality and OHQoL was associated with sociodemographic and oral health factors. [J Public Health Dent 2003;63(2):73-77]*

Key Words: oral health, quality of life, social impact.

Traditionally, clinical "objective" oral health status measures have been utilized in assessing oral health (1). There are concerns that these clinical measures alone may not be adequate for assessing the public's oral health needs or for planning services because they provide little information about the consequences of oral health (2). Moreover, there is increasing agreement among many clinicians and health service researchers that patients' views should be measured when assessing outcomes from oral health care (3). Not only is such measurement important in understanding the value of oral health to people's lives, it is also of use in evaluating the quality and effectiveness of oral health care services (4,5).

Initially, attempts were made to utilize generic health-related quality-of-life measures to assess the impact of oral health on quality of life; however, these instruments were regarded as not sensitive enough to capture the subtle changes in oral health status (6). Subsequently, numerous oral health-specific quality-of-life measures were developed and tested in a number of industrialized and developing nations (7). While these instruments vary in terms of the dimensions, domains, and number of items they contain, it is generally accepted that at present no one indicator is better than another (8).

Much of the work in this field has focused on older adults, particularly on the burden of older disease in later life, because quality-of-life issues are acknowledged as important in aging research (9,10). Information on the impact of oral health among younger age groups or from national perspectives is less readily available (11). It is also important to document the impact of oral health on life quality at points in time, to identify variations in impact among subgroups of the population in planning and evaluating care, and also to provide national norms to facilitate international comparisons (12).

The aim of this study was to assess the impact of oral health on life quality in Great Britain utilizing the UK oral health-related quality-of-life instrument OHQoL-UK(W)©. In addition, this study sought to identify variations in oral health-related quality of life in relation to sociodemographic and self-reported oral health status factors and to determine important predictors of oral health-related quality of life in Britain.

Methods

Study Group. The vehicle for this study was the Office for National Statistics (ONS) Omnibus survey in Great Britain. The sampling frame was the entire Postcode Address File (PAF), which is the most complete list of addresses in Britain. One hundred postal sectors were selected randomly from the PAF, from which 30 household addresses were selected randomly throughout the country. Only residential addresses were included in the study: 2,667 of the 3,000 selected addresses. Thirty interviewers were trained and calibrated by the ONS to standardize the interview process and a quality check of field work was conducted during the study. Advance letters were sent to all addresses prior to the interview, giving a brief account of the survey. Interviewers sought to carry out a face-to-face interview with an English-speaking adult respondent privately at each household address selected during June 1999. Within households with more than one adult member, one person aged 16 or older was selected with the use of random number tables.

Data Collection. Participants were asked about their oral health status—number of teeth they pos-

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sessed and denture status. In addition, sociodemographic information was collected: age, sex, and social class. Social class was based on "Registrar's General Classification of Occupation," which categorizes an individual based on the occupation of the head of household into two broad groups: higher (higher and lower professional, and trained nonmanual workers) and lower (trained manual workers, semiskilled and unskilled workers). The impact of oral health on their quality of life was assessed utilizing the UK oral health-related quality-of-life measure, OHQoL-UK(W)©, which was developed based on the public's perception in the UK of how oral health affects life quality (13). OHQoL-UK(W)© consists of 16 key questions relating to 16 key areas of oral health-related quality of life—such as comfort, speaking, and social life—identified from the public's perception study. Respondents were first asked: "What effect does the condition of your teeth, gums, mouth, and/or denture have on your (1 of 16 key areas)? Good, none, or bad?" They were then asked: "How would you rate the impact of this effect on your overall quality of life? None, little, moderate, great, or extreme?" Summing up responses from individual questions can produce overall OHQoL-UK(W)© scores ranging from 16 (all bad effects of extreme impact) to 144 (all good effects of extreme impact). In addition, summing up responses to items in each domain (physical, social, and psychological) can produce subdomain scores. The psychometric properties of the instruments are reported to be good, demonstrating acceptable validity and reliability in a local survey (14).

Data Analysis. The response rate to the survey was calculated and frequency tables were produced to explore the prevalence of effects and their impact on life quality. Variations in OHQoL-UK(W)© scores and its subdomains (physical, social, and psychological) in relation to sociodemographic and oral health status (self-reported number of teeth possessed and denture status) were examined. The statistical tests chosen to identify variations in OHQoL-UK(W)© scores were the Mann-Whitney U and Kruskal Wallis tests (nonparametric alternatives to the *t*-test and ANOVA) and results were expressed as median OHQoL-UK(W)© values and interquartile ranges. OHQoL-UK(W)© scores were categorized into a binary dependent variable, "enhanced" oral health-related quality of life (1=above the median population value; 0=median value or below) and then forward

TABLE 1
Profile of Study Group

		Number (%)
Sociodemographic profile		
Age (years)	16–44	843 (47)
	45–64	541 (30)
	65 and older	417 (23)
Sex	Male	813 (45)
	Female	988 (55)
Social class	Higher (I, II, IIINM)	999 (56)
	Lower (IIIM, IV, V)	737 (41)
	Uncategorized	65 (4)
Self-reported oral health status		
Number of teeth	20 or more	1,256 (70)
	10–19	218 (12)
	Fewer than 10	327 (18)
Denture status	Wear full/partial dentures	557 (31)
	Do not wear dentures	1,244 (69)
WHO goal	More than 20 teeth without removable prosthesis	1,699 (94)
	Fewer than 20 teeth or more than 20 teeth with recourse to denture	102 (6)

TABLE 2
UK Public's Perception of Perceived Ways in Which Oral Health Affects Quality of Life

	Good Effect % (*n*)	No Effect % (*n*)	Bad Effect % (*n*)
Physical			
Eating/enjoyment of food	38 (688)	53 (948)	9 (165)
Appearance	45 (801)	46 (832)	9 (168)
Speech	27 (477)	70 (1,264)	3 (60)
General health	37 (674)	59 (1,055)	4 (72)
Comfort	39 (697)	55 (981)	7 (123)
Breath odor	33 (590)	60 (1,073)	8 (138)
Social			
Social life	25 (458)	72 (1,298)	3 (45)
Romantic relationships	26 (464)	72 (1,290)	3 (47)
Smiling or laughing	35 (638)	58 (1,039)	7 (124)
Work/ability to do usual jobs	17 (309)	82 (1,480)	1 (12)
Finances	7 (122)	87 (1,570)	6 (109)
Psychological			
Confidence	30 (543)	64 (1,158)	6 (100)
Sleep/ability to relax	15 (261)	83 (1,496)	2 (44)
Carefree manner	19 (338)	79 (1,414)	3 (49)
Mood	19 (334)	79 (1,418)	3 (49)
Personality	19 (348)	79 (1,422)	2 (31)

TABLE 3
UK Public's Perception of Impact of Perceived Oral Health Effects on Quality of Life

	Positive/Negative Influences	Little Impact % (*n*)	Moderate Impact % (*n*)	Great Impact % (*n*)	Extreme Impact % (*n*)
Physical					
Eating/enjoyment of food	+	7 (121)	10 (181)	19 (344)	2 (42)
	–	1 (11)	2 (33)	4 (71)	3 (50)
Appearance	+	7 (133)	14 (247)	21 (371)	3 (50)
	–	<1 (4)	2 (31)	3 (61)	4 (72)
Speech	+	2 (41)	7 (125)	15 (270)	2 (41)
	–	<1 (4)	1 (10)	2 (29)	1 (17)
General health	+	5 (85)	10 (188)	20 (357)	2 (44)
	–	<1 (5)	1 (22)	2 (30)	1 (15)
Comfort	+	5 (85)	11 (194)	20 (360)	3 (58)
	–	<1 (8)	2 (33)	3 (57)	1 (25)
Breath odor	+	4 (65)	7 (132)	18 (316)	4 (77)
		1 (17)	1 (20)	4 (68)	2 (33)
Social					
Social life	+	3 (45)	7 (117)	15 (262)	2 (34)
	–	<1 (5)	1 (12)	1 (21)	<1 (7)
Romantic relationships	+	2 (42)	5 (95)	15 (271)	3 (56)
	–	<1 (9)	1 (11)	1 (19)	<1 (8)
Smiling/laughing	+	4 (64)	8 (146)	20 (366)	3 (62)
	–	<1 (7)	1 (21)	3 (54)	2 (42)
Work/ability to do usual job	+	2 (35)	4 (76)	10 (172)	1 (26)
	–	<1 (3)	<1 (6)	<1 (3)	—
Finances	+	1 (23)	2 (36)	3 (53)	<1 (10)
	–	1 (14)	2 (30)	2 (33)	2 (32)
Psychological					
Confidence	+	2 (44)	9 (154)	16 (291)	3 (54)
	–	<1 (6)	2 (35)	2 (36)	1 (23)
Sleep/ability to relax	+	1 (25)	4 (64)	8 (145)	2 (27)
	–	<1 (2)	1 (17)	1 (15)	1 (10)
Carefree manner	+	2 (34)	5 (96)	10 (182)	1 (26)
	–	<1 (8)	1 (14)	1 (22)	<1 (5)
Mood	+	2 (30)	5 (88)	10 (186)	2 (30)
	–	<1 (6)	1 (11)	1 (24)	<1 (8)
Personality	+	2 (28)	6 (100)	11 (190)	2 (30)
	–	<1 (2)	<1 (7)	1 (15)	<1 (7)

stepwise logistic regression analysis (Wald) was carried out to identify predictors of oral health-related quality of life, having accounted for other factors in the model.

Results

Response Rate. The response rate to the survey was 70 percent, with 1,855 people participating in the study; a further 54 (2%) interviews were discarded because of incomplete assessments of oral health-related quality of life. The profile of the group is shown in Table 1.

Prevalence of "Effects" and their "Impacts" on Life Quality. The majority of the public (73%; 1,307) perceived that their oral health did affect their quality of life in one way or another. Across all of the 16 aspects of oral health-related quality of life, the group perceived more frequently that oral health had more positive than negative influences on life quality (Table 2). Oral health's influence on life quality was viewed more frequently as physical rather than social or psychological, although many did feel their smiling/laughing (42%; 762) and confidence (36%; 643) were affected by their oral health status (Table 2). Likewise, the "great" or "extreme" impact oral health effects had on life quality were through positive enhancing physical attributes (Table 3).

Variations in Oral Health-related Quality of Life. Bivariate analysis identified disparities in the impact oral health had on life quality in relation to sociodemographic factors, age group ($P<.01$), and social class background ($P<.01$). In addition, variations in oral health-related quality of life were apparent in relation to clinical oral health

TABLE 4
Variations in Oral Health-related Quality-of-life Scores: Sociodemographic and Self-reported Oral Health Status*

	Total OHQoL-UK (W)© Score	Physical OHQoL-UK (W)© Score	Social OHQoL-UK (W)© Score	Psychological OHQoL-UK (W)© Score
Age (years)				
16–44 (*n*=843)	82 (80–104)	32 (30–42)	25 (25–31)	25 (25–29)
45–64 (*n*=541)	81 (80–100)	31 (30–42)	25 (25–29)	25 (25–28)
65 and older	80 (80–92)	30 (30–37)	25 (25–27)	25 (25–27)
	χ^2=10.48, *P*<.01	χ^2=12.26, *P*<.01	χ^2=12.51, *P*<.01	χ^2=8.45, *P*<.05
Sex				
Male (*n*=813)	82 (80–101)	31 (30–42)	25 (25–30)	25 (25–29)
Female (*n*=988)	81 (80–99)	31 (30–41)	25 (25–29)	25 (25–28)
	Z=1.39, *P*>.05	Z=1.01, *P*>.05	Z=1.35, *P*>.01	Z=1.08, *P*>.05
Social class				
Higher (*n*=999)	83 (80–103)	32 (30–43)	25 (25–31)	25 (25–30)
Lower (*n*=739)	80 (80–87)	30 (30–35)	25 (25–28)	25 (25–27)
	Z=5.06, *P*<.01	Z=4.67, *P*<.01	Z=4.89, *P*<.01	Z=5.38, *P*<.01
Number of teeth				
20 or more (*n*=1,256)	83 (80–104)	32 (30–42)	25 (25–31)	25 (25–30)
Fewer than 20 (*n*=545)	80 (80–87)	30 (30–35)	25 (25–27)	25 (25–25)
	Z=7.84, *P*<.01	Z=7.83, *P*<.01	Z=6.87, *P*<.01	Z=6.42, *P*<.01
Denture status				
No denture	83 (80–104)	32 (30–42)	25 (25–31)	25 (25–30)
Partial/full	80 (80–88)	30 (30–36)	25 (25–27)	25 (25–26)
	Z=6.08, *P*<.01	Z=6.19, *P*<.01	Z=5.81, *P*<.01	Z=4.52, *P*<.01
WHO goal				
20 or more teeth & no recourse to denture	84 (80–105)	33 (30–43)	25 (25–31)	25 (25–30)
<20 teeth/>20 with denture	80 (80–88)	30 (30–36)	25 (25–27)	25 (25–26)
	Z=8.08, *P*<.01	Z=8.12, *P*<.01	Z=7.36, *P*<.01	Z=6.10, *P*<.01

*Results expressed as median (interquartile range).

TABLE 5
Findings from Logistic Regression Analysis

Enhanced OHQOL	Regression Coefficient	Standard Error	Odds Ratio	95% CI	*P*-value
WHO goal (0=no, 1=yes)	0.63	0.10	1.87	(1.53, 2.29)	<.001
Social class (0=lower, 1=higher)	0.34	0.10	1.40	(1.15, 1.71)	<.01
Sex (0=male, 1=female)	0.21	0.10	1.23	(1.01, 1.49)	<.05
Age group (0=<65, 1=65+)					.65

status (self-reported), number of natural teeth retained (*P*<.01), and denture status (*P*<.01) (Table 4).

The combined effect of sociodemographic and clinical (self-reported oral health status) factors on oral health-related quality of life was explored in the regression analysis (Table 5). Possessing 20 or more natural teeth without the use of a removable prosthesis emerged as an important predictor of the influence of oral health on quality of life. Those who claimed they had 20 or more natural teeth and didn't wear a partial denture were approximately twice as likely to have OHQoL-UK(W)© scores above the population's median value (median value=82), indicative of experiencing enhanced oral health-related quality of life (OR=1.87; 95% confidence interval [CI]=1.53, 2.29). Among the sociodemographic factors, social class was an important predictor; people from higher social class backgrounds were 40 percent more likely to be among those with high oral health-related quality of life (above the United Kingdom's median OHQoL-UK(W)© value) compared to those from lower social class backgrounds (OR=1.40; 95% CI=1.15, 1.70). Sex differences were also apparent: women fared better than men in terms of the influence oral health had on life quality (OR=1.23; 95% CI=1.01, 1.50).

Discussion

Thirty percent declined to participate in the survey, citing lack of time among other reasons. No sociodemographic (age, sex, or social class) information exists for these nonparticipants, which could have nonre-

sponse bias implications. However, the age, sex, and social class profile of the study group is similar to findings from the most recent UK census (15).

A common problem with oral health-related quality-of-life surveys is failure of participants to complete all sections of the questionnaire or interview, which subsequently affects generating an overall score of impact (11). In this study, the response rate to the quality-of-life questions was good both in terms of rating the "effects" and then rating the "impact" of each effect. Where interviews were incomplete, it was primarily because interviewees were unsure how to rate their perceptions ("don't know" categories). Only 2 percent (54) of interviews had to be discarded because of incomplete answers, where more than 3 of the 32 ratings (16 "effect" ratings and 16 "impact" ratings) were incomplete. This indicates good face validity of the instrument and suggests its applicability in national surveys. In cases where 3 or fewer of responses were incomplete average ratings were used for missing values.

The majority of people in Britain felt their oral health did affect their life quality; this supports earlier findings from a qualitative study in 1997–98, which also suggested most people in Britain do perceive that their oral health affects their life (13). It is also interesting that they perceive its impact to be largely a positive enhancing one. Far too often in assessing the impact of oral health, researchers have focused only on the negative burdening influences of oral health and have failed to consider its positive enhancing values to life quality (16). Assessing positive dimensions of oral health may be more appropriate in general population studies because many in the population have relatively good clinical oral health status and enjoy positive experiences as a result.

Sociodemographic differences in the impact oral health had on life quality were evident. Social class emerged as an important factor of oral health-related quality of life in bivariate and regression analysis. The social gradient in oral health-related quality of life has been suggested widely in the literature (17) and this study supports this finding from a national perspective. Interestingly, age variations were apparent in bivariate analysis, but not so in the regression model, suggesting that while older people have poorer oral health-related quality of life, it reflects their clinical oral health status rather than an aspect of aging per se. Sex, on the other hand, emerged in the regression model as a marginally significant factor, suggesting that women enjoy higher oral health-related quality of life compared to men. Conflicting evidence of the influence of sex on perceptions of how oral health impacts on life quality has been reported (17-19). Discerning sex differences in oral health is important and may facilitate understanding differences in oral health practices such as service utilization; this requires further investigation.

Self-reported oral health status (number of natural teeth and possessing a denture) were associated with the influences oral health had on life quality, as has been suggested in the literature (17,20). Interestingly, possessing 20 or more teeth and not having a removable prosthesis was a very important predictor of those enjoying the highest oral health-related quality of life in Britain. Some years ago the World Health Organization suggested the oral health goal for all was to retain "not fewer than 20 teeth and not require recourse to a prosthesis" (21). This recommendation and goal still appears to be an important target for oral health care providers in Britain today to ensure that the public can enjoy the positive contribution oral health makes to life quality.

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