

Complete dentures and oral health-related quality of life – do coping styles matter?

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Abstract – Oral health-related quality of life (OHRQOL) in edentulous patients with complete dentures is often impaired. This paper investigates the effect of different coping styles on OHRQOL. Purpose: (a) To assess OHRQOL of edentulous patients with conventional complete dentures, and (b) to investigate if individual differences in these patients' styles of coping with stress affect their OHRQOL. Materials and methods: Data were collected from 249 fully edentulous patients with complete dentures (mean age: 66.0 years) who responded to a mailed survey (adjusted response rate: 48.8%). OHRQOL was measured with the 14-item short form of the oral health impact profile (OHIP). Ratings of coping strategies were obtained using the 28-item Brief COPE, an instrument measuring various styles of coping with stress. Linear regression analyses were used to explore the relationships between coping styles, background variables such as age, gender, income, and age of prosthesis, and the patients' OHRQOL. Results: About 35% of the respondents reported impacts from their oral conditions on their overall OHRQOL (OHIP-14 total score) occasionally, fairly often, or often. Physical pain was even more prevalent, with 53.3% of the respondents reporting pain impacts. The linear regression model (P < 0.0001) explained 31.1% of the variation in the OHIP-14 total score. The coping variables instrumental support, behavioral disengagement, substance abuse, denial, and religion were significant negative predictors of OHRQOL. Only emotional support was a significant positive predictor of OHRQOL. Conclusion: Wearing conventional complete dentures has a significant impact on OHRQOL. This impact is moderated by the styles a patient uses to cope with stress. Using emotional support has a positive effect on OHRQOL, while other coping styles, namely instrumental support, behavioral disengagement, substance abuse, denial, and religion are significant negative predictors of OHRQOL.

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Research on the quality of medical and dental treatment has mostly focused on patients' satisfaction with various aspects of their appointments or on treatment outcomes (e.g. 1–3). For example, such factors as the patient satisfaction with the access to dental treatment, with the personal encounter in the dental practice, and the quality of treatment have been identified as explanatory variables for overall ratings of dental treatment satisfaction (1, 2). Studies of patient satisfaction with specific aspects of certain dental treatments

such as satisfaction with certain types of dentures (4–7) complemented this general research. However, associations between patient ratings of treatment success, and clinical measures of oral conditions (7, 8), oral stereognosis (9, 10), patient experience with previous dentures, or the technical quality of complete denture treatment are mostly weak (7, 8, 11, 12). Similarly, socioeconomic factors (13, 14) and demographic variables (8, 11) do not appear to play a significant role for a patient's acceptance of removable dentures. Research has

also investigated the influence of psychologic factors on patients' satisfaction with dental treatment. The effects of personality traits such as neuroticism, fear and anxiety as well as depression have been discussed and extensively reviewed (15). In a number of articles, significant but only moderate negative influences of neuroticism on satisfaction with removable dentures have been reported (16, 17). Other authors reported low and nonsignificant correlations between these factors and dental patients' treatment satisfaction (15, 18).

More recently, oral health-related quality of life (OHRQOL) has been considered as an outcome variable in clinical studies to assess the impact of edentulism and available treatment options (7, 19-24). OHRQOL can be defined as the part of quality of life that is affected by a person's oral health. In particular, this term captures how oral health affects the person's ability to function (e.g. bite, chew, speak), psychologic states (such as selfesteem, and satisfaction with one's appearance), social factors, and pain/discomfort related to oral health (25). Allison (26) defined quality of life as a dynamic construct that is a function of a number of variables such as stress, depression, cognitive appraisal, and coping. OHRQOL can be measured using a questionnaire approach. Results can serve as an outcome measure; they allow insight into how a patient's oral health affects this person's well-being and quality of life at a given point in time. Prosthodontic research showed that patients' OHRQOL is also affected by the type of treatment used, in particular whether implant retained dentures or conventional dentures were placed in an edentulous patient (19-21, 27).

This study focuses on how having conventional complete dentures affects a person's OHRQOL. Additionally, it explores whether patients' styles of coping with stress will shape their OHRQOL after they received these dentures. The term 'coping' refers to cognitive and behavioral efforts that patients use to manage specific external or internal demands that they regard as stressful, and as taxing or exceeding their own resources (28). Individuals differ in their coping efforts (28). Two basic coping styles, namely problem-focused versus emotion-focused coping, have been described in the literature. Problem-focused coping is directed at managing or changing the problem that causes stress. Emotion-focused coping, however, aims at regulating the emotional response to the problem (29, 30). Some authors have argued that the distinction between these two coping styles may be too simple. They therefore suggested to study these two categories in more detail. For example, emotion-focused coping may involve denial that there is a problem, positive reinterpretation of an event, or it may involve seeking social support. Problem-focused coping can involve planning of solutions, taking direct action to change the situation, or forcing oneself to wait (31, 32).

Impaired health and chronic diseases are often accompanied by high levels of stress. An inability to cope well with stress and inadequate coping behaviors can increase stress over time and lead to negative long-term outcomes. A person's coping style can therefore have a significant moderating effect on the outcome of life crises (33) and on quality of life in medical settings (34). Coping behaviors also play a significant role for a person's oral health. Research showed that inadequate, emotion-focused coping behaviors that aim at merely reducing the emotional effects of experienced life stress are associated with a higher risk of severe periodontal disease (35), whereas problemfocused coping is related with higher levels of wellbeing (36), and a lower risk of periodontal disease (35).

Research also showed that impaired dental health and certain dental treatments cause severe stress in adults. Losing one or more teeth was ranked as requiring the same amount of coping effort as having 'trouble with relatives' in a study of 400 Norwegian adults (37). Getting dentures was rated even higher in severity, namely as causing stress comparable with the stress experienced when having 'trouble with a spouse' (37, 38). There is also empirical evidence that the impact of certain dental treatments is so severe that the patients' adjustment skills are not sufficient over time. For example, 12% of the patients who had received implant retained dentures reported that their implant treatment had affected their social life and had triggered psychologic problems (39).

This research shows that the stress of dental treatments can clearly affect an individual's OHRQOL (24). The central objectives of this study therefore are (a) to assess OHRQOL of dental patients with conventional complete dentures, and (b) to investigate if different coping strategies affect their OHRQOL. It was hypothesized that the more patients use emotion-focused coping mechanisms when adjusting to stressful life situations or daily hassles, the poorer their OHRQOL would be.

Materials and methods

Participants

Patient records at the University of Michigan School of Dentistry were used to identify completely edentulous patients who had received new sets of conventional complete dentures between July 1996 and June 2000. A sample of 600 patients was drawn from these patient records using a random numbers method. Addresses of the subjects were obtained from the billing records.

Procedure

All 600 subjects received an envelope with a letter describing the purpose of the study, the questionnaire, a consent form, and a stamped return envelope. The protocol was approved by the University of Michigan Institutional Review Board for the Health Sciences, and written informed consent was obtained from all participants. The study was designed as a three-wave mailing. Subjects who did not respond to the first mailing received a reminder postcard 2 weeks later. Those persons who had still not responded after another 2 weeks received a second complete package of materials.

Materials

The questionnaire included questions concerning the respondents' sociodemographic background (age, education, income, professional situation, and marital status), their coping style, and their OHRQOL. OHRQOL was measured using the 14-item short version of the OHIP (23, 40). This version of the OHIP possesses adequate psychometric properties while significantly reducing the burden on the respondent compared with the 49item original version (40-42). The OHIP-14 scores correlate well with other measures of OHRQOL and clinical findings (43, 44). The reference period was 1 month (...within the last month...) and items were scored on 5-point scales ranging from '1' ='never' to 5' = 5' very often'. Thus, higher scores indicate worse OHRQOL. Subscale and total scores were calculated by adding the item scores without weighting (45).

Coping styles were measured using the 'Brief COPE' (46). The Brief COPE is a shortened 28-item inventory based on the COPE instrument (32, 46). Again, this instrument was selected for its good psychometric properties in combination with its reduced number of items. The items of the COPE are derived from the Lazarus and Folkman model of coping (28). This instrument has 14 scales with two items each. The respondents are required to indicate how they would respond if they were confronted with difficult or stressful events in their lives. The answers to the items were given on 4-point-rating scales ranging from '0' = 'I haven't been doing this at all' to '3' = 'I've been doing this a lot'. Scale scores were calculated by simply adding the item scores.

Analyses

Response rates were calculated based on the total possible responses, excluding those persons who could not respond because their mail was undeliverable, or because of language deficiencies, cognitive impairments, or death. A level of P < 0.05 was set for significance for these and all further analyses.

Alpha coefficients (47) were calculated to check for the reliability of the subscales of the OHIP-14 and the Brief COPE. Data from the Brief COPE were analyzed using a factor analysis with oblique rotation and Kaiser normalization to check whether the original factor structure suggested by the authors (46) was also found in this study.

Frequency distributions of the responses on the OHIP-14 and the Brief COPE scales were provided. For this purpose, the responses to the items on a given subscale were averaged in order to be able to show the distribution of the responses on the original item response categories for each instrument (4-point scales for the Brief COPE, 5-point scales for the OHIP-14).

Stepwise linear regression analyses were used to explore the relationships between patient characteristics (e.g. age, gender, income), denture-related variables (time edentulous, age of the prosthesis), as well as the respondents' coping styles, and the OHIP-14 total scores.

Results

Response rate

Of the 600 mailed surveys, 137 were returned after the first mailing (22.8%). After reminder postcards were sent, another 46 questionnaires (7.7%) were received. Surveys were then mailed to the remaining nonresponding subjects in the sample for a second time, which resulted in another 66 responses (11%). Sixty-six of the 600 packages were undeliverable. In 18 cases, relatives responded that the recipient was deceased. In an additional six

Table 1. Demographic data and age of prosthesis

	n (%)
Gender	
Male	113 (45.2)
Female	136 (54.8)
Marital status	
Single	36 (14.6)
Married	127 (51.4)
Divorced	41 (16.6)
Widowed	43 (17.4)
Employment status	
Employed	49 (20.3)
Not employed	192 (79.7)
Income (US\$)	
<25 000	172 (77.8)
25 000-50 000	37 (16.7)
>50 000-100 000	11 (5.0)
>100 000	1 (0.5)
	Mean [years; SD; range]
Age	66.0 [12.0; 29–91]
Age of denture	3.2 [4.2; 0-45]
Time edentulous	19.8 [17.9; 1–66]

cases, cognitive impairment or language problems were reported. One person had lost the dentures and did not wear dentures at this point. The response from this person was excluded from the analysis. Ten subjects refused participation. Therefore, 261 persons (51.2%) remained as actual nonrespondents, and 249 respondents returned valid responses (adjusted response rate: 48.8%).

Demographic variables

The 249 former patients (male: n = 113 male; 45.2%; female: n = 136; 54.8%) ranged in age from 29 to 91 years (average age: 66.0 years). The age of the currently worn denture ranged from 0 (new) to 45 years (average denture age: 3.2 years). The respondents had been edentulous for 19.8 years on average (range: 1–66 years). The majority of

subjects were female (n = 136; 54.8%), and married (51.8%). Most patients were retired (n = 192; 79.9%), and had annual gross incomes below 25 000 US\$ (n = 172; 77.8%; see Table 1). A comparison of the respondents' and the nonrespondents' characteristics could not be performed, because the nonrespondents had not given written consent to analyze their chart review data, and the institutional review board did not grant permission to conduct these analyses without written consent.

OHIP-14

The reliability coefficients α for the OHIP-14 subscales ranged from 0.73 to 0.86, indicating that these subscales measure the various aspects of OHRQOL reliably (see Table 2). The frequency distribution of the answers on these subscales as well as the OHIP total score are presented in Table 2. The results showed that overall about 35% of the respondents had impacts from their oral conditions on their OHRQOL occasionally (20.3%), fairly often (10.0%), or very often (4.6%). Physical pain was the most prevalent OHRQOL impairment, with 8.3% of the respondents indicating that they had physical pain very often, 31.3% occasionally, and 13.8% fairly often. More than a third of the respondents had functional limitations occasionally (24.9%), fairly often (9.5%), or very often (3.7%). Psychologic discomfort was also reported by more than a third of the respondents (occasionally: 20.3%; fairly often: 9.5%; very often: 5.8%). Reports of physical and psychologic disability were slightly less prevalent. However, still about one-third of the participants were impacted occasionally, fairly often, or often. Only the responses concerning social disabilities and handicap were significantly lower, with only 16.9% and 14.3% of the respond-

Table 2.	Mean	scale scores,	frequencies,	and]	percentages	of responses	to the	e OHIP-1	14 subscales	and	the total scores	;
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		Scale scores		Responses by category, <i>n</i> (%)						
OHIP subscales	Coefficient α	Mean	SD	1 Never	2 Hardly ever	3 Occasionally	4 Fairly often	5 Very often	3/4/5 combined	
Functional limitation	0.73	4.2	2.1	71 (29.5)	78 (32.4)	60 (24.9)	23 (9.5)	9 (3.7)	92 (39.1)	
Physical pain	0.75	4.9	2.3	44 (18.3)	68 (28.3)	75 (31.3)	33 (13.8)	20 (8.3)	128 (53.4)	
Psychologic discomfort	0.86	4.0	2.4	109 (45.2)	46 (19.1)	49 (20.3)	23 (9.5)	14 (5.8)	86 (35.6)	
Physical disability	0.80	4.2	2.3	68 (28.2)	91 (37.8)	38 (15.8)	29 (12.0)	15 (6.2)	82 (34)	
Psychologic disability	0.84	3.8	2.2	99 (41.8)	65 (27.4)	45 (19.0)	14 (5.9)	14 (5.9)	73 (30.8)	
Social disability	0.80	3.0	1.7	145 (61.2)	52 (21.9)	26 (11.0)	10 (4.2)	4 (1.7)	40 (16.9)	
Handicap	0.74	3.1	1.8	137 (57.8)	66 (27.8)	17 (7.2)	11 (4.6)	6 (2.5)	34 (14.3)	
Total score		27.3	12.7	33 (13.7)	124 (51.5)	49 (20.3)	24 (10.0)	11 (4.6)	84 (37.9)	

ents indicating that they had these OHRQOL impairments occasionally, fairly often, or very often.

Brief COPE

Factor structure of the Brief COPE

A factor analysis with oblique rotation and Kaiser normalization of the 28 items of the Brief COPE yielded six factors with eigenvalues greater than 1, which together accounted for 69.9% of the response variance. Based on the number of respondents, a level of significance for item/factor correlations of r = 0.38 was established (48). The original items from the active coping, planning, positive reframing, self-distraction, and acceptance scales all had strong and significant loadings (r = 0.50-0.867) on the first factor, which was labeled 'positive/ adequate coping'. The second item from the selfdistraction scale also had a low and nonsignificant loading on the second factor (r = 0.33), and one of the acceptance items also loaded on the third factor (religion; r = 0.375). Both items from the substance abuse scale made up the second factor; factor 3 was combined from the two humor items. Both the instrumental and the emotional support items loaded significantly on the fourth factor, as well as one of the venting items, which narrowly failed significance (r = 0.373) and also loaded on the sixth factor (r = 0.352). This factor was labeled 'support'. The fifth factor comprised the two religion items, both with significant loadings. The sixth factor included both items from the denial, behavioral disengagement, and self-blame scales as well as the second 'venting' item and was labeled 'inadequate coping' (Table 3). Reliability was highest for the substance abuse, religion, active coping, planning, and humor subscales (r > 0.85), and lowest for the venting and self-distraction subscales (r < 0.67; Table 4).

Results from the Brief COPE

The frequency distribution of the responses on the Brief COPE scales presented in Table 4 showed that

Table 3. Factor structure matrix of the Brief COPE with the highest factor loadings of each item on the scale obtained from the factor analysis given in bold

		Component								
Scale ^a	Item no. ^a	Positive/ adequate coping	Substance abuse	Humor	Support	Religion	Inadequate coping			
Active coping	2	0.867	-0.045	-0.065	-0.147	-0.131	0.029			
	7	0.828	-0.081	-0.047	-0.132	-0.003	-0.031			
Acceptance	20	0.504	0.149	0.211	0.021	0.375	-0.105			
1	24	0.537	0.082	0.216	0.014	0.248	-0.125			
Planning	14	0.807	-0.029	0.088	-0.006	-0.035	0.118			
0	25	0.733	-0.039	-0.012	-0.003	0.200	0.124			
Positive reframing	12	0.521	0.026	0.063	-0.201	0.271	-0.044			
Ũ	17	0.579	0.071	0.100	-0.108	0.254	-0.161			
Self-distraction	1	0.809	0.013	-0.039	0.039	-0.152	0.143			
	19	0.524	0.330	-0.021	0.014	0.128	0.081			
Substance abuse	4	-0.004	0.911	0.139	-0.003	-0.031	0.006			
	11	-0.039	0.918	0.104	0.014	0.011	0.050			
Humor	18	0.024	0.132	0.861	-0.109	-0.060	0.043			
	28	-0.046	0.123	0.840	-0.119	-0.083	0.022			
Emotional support	5	0.119	0.091	0.021	-0.827	0.000	-0.128			
	15	-0.065	-0.091	0.171	-0.748	0.217	0.023			
Instrumental support	10	0.107	-0.003	0.080	-0.825	-0.042	0.024			
	23	0.031	-0.027	0.042	-0.692	0.155	0.106			
Venting	9	0.139	0.139	-0.053	-0.373	0.054	0.352			
	21	0.209	-0.105	0.242	-0.288	-0.094	0.401			
Religion	22	0.047	-0.006	-0.125	-0.100	0.886	0.097			
	27	-0.049	-0.022	-0.029	-0.145	0.872	0.093			
Denial	3	0.163	0.236	-0.227	-0.064	0.092	0.544			
	8	-0.041	0.007	-0.012	-0.120	0.031	0.717			
Behavioral disengagement	6	0.015	0.293	-0.088	0.026	-0.039	0.659			
	16	-0.030	0.231	-0.110	-0.248	-0.122	0.544			
Self-blame	13	0.197	-0.070	0.188	0.018	0.147	0.589			
	26	0.114	-0.151	0.252	0.179	0.198	0.750			

^aOn original questionnaire (46).

Table 4. Frequencies and percentages of responses on the Brief COPE scales

Brief COPE scale	Coefficient α	I am not doing this at all, <i>n</i> (%)	I am doing this a little bit, <i>n</i> (%)	I am doing this a medium amount, <i>n</i> (%)	I am doing this a lot, <i>n</i> (%)
Active coping	0.85	68 (29.8)	49 (21.5)	64 (28.1)	47 (20.6)
Planning	0.81	78 (35.1)	41 (18.5)	50 (22.5)	53 (23.9)
Positive reframing	0.66	71 (32.3)	52 (23.6)	58 (26.4)	39 (17.7)
Acceptance	0.81	51 (23.8)	31 (14.5)	59 (27.6)	73 (34.1)
Humor	0.85	117 (54.2)	62 (28.7)	25 (11.6)	12 (5.6)
Religion	0.75	66 (30.6)	47 (21.8)	40 (18.5)	63 (29.2)
Emotional support	0.84	99 (43.4)	69 (30.3)	39 (17.1)	21 (9.2)
Instrumental support	0.80	103 (46.4)	76 (34.2)	36 (16.2)	7 (3.2)
Self-distraction	0.90	76 (33.3)	61 (26.8)	66 (28.9)	25 (11.0)
Denial	0.74	142 (61.7)	50 (21.7)	29 (12.6)	9 (3.9)
Venting	0.67	90 (40.5)	80 (36.0)	41 (18.5)	11 (5.0)
Substance abuse	0.92	189 (81.8)	25 (10.8)	12 (5.2)	5 (2.2)
Behavioral disengagement	0.78	147 (64.5)	57 (25.0)	18 (7.9)	6 (2.6)
Self-blame	0.92	104 (47.1)	73 (33.0)	34 (15.4)	10 (4.5)

the most frequently used coping style was acceptance (doing a lot: 34.1%; doing a medium amount: 27.6%), while the least frequently used style was substance abuse (not at all: 81.8%), followed by behavioral disengagement (not at all: 64.5%), and denial (not at all: 61.7%). About 30% of the respondents indicated that they do not use active coping in stressful situations. More than a third of the respondents also did not use planning, and slightly less than a third did not use positive reframing. The majority of respondents (54.2%) reported that they did not use humor as a coping mechanism. However, 29.2% of subjects reported that they used religion 'a lot' as a way of coping with stress. Nearly half of the respondents indicated that they never used the two 'social support' coping mechanisms (instrumental support: 46.4%; emotional support: 43.4%). Self-distraction was a more frequently reported coping strategy for 28.9% of the respondents using it 'a medium amount', and 11.0% 'a lot'.

Association between OHRQOL and coping styles

The results of the stepwise linear regression analysis showed that the model explained 31.1% of the variation in the OHIP-14 total score (P < 0.0001; Table 5). The final model included the coping variables instrumental support, behavioral disengagement, substance abuse, denial, and religion as significant negative predictors of OHRQOL as seen in higher OHIP-14 scores. Only emotional support was a significant positive predictor of OHRQOL; the use of this coping mechanism resulted in a 2-point lower OHIP-14 total score (on a scale with a

Table 5	Stenwise	regression	analysis	of	the	OHIP-14
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total sco	re (depend	lent variabl	e)			

Factor	Unstandardized coefficients (β)	SE	<i>P</i> -value
(Constant)	7.081	2.545	0.006
Emotional support	-2.002	0.618	0.001
Instrumental support	2.636	0.741	0.000
Behavioral disengagement	2.107	0.747	0.005
Substance abuse	1.829	0.635	0.004
Denial	1.208	0.600	0.045
Religion	1.076	0.354	0.003

Model summary: $R^2 = 0.311$; SE = 10.97; P = 0.000.

maximum of 70 points; Table 5). All other explanatory variables such as age, age of the denture, the length of time a patient had been edentulous, and the remaining items from the coping subscales emerged as nonsignificant and consequently were excluded from the final model.

Discussion

This research presents the results from a crosssectional study of OHRQOL in an adult edentulous population with conventional complete dentures, and of how their styles of coping with stress affect their OHRQOL.

Concerning the way the data were collected, the decision was made to use a three-wave mailing procedure consisting of the initial mailing, one reminder postcard, and a second mailing of the survey. This decision was based on research that showed that four-wave mailing procedures do not

result in significantly higher response rates compared with three-wave procedures, but that they are significantly more resource intensive (49). The adjusted response rate of 48.8% was slightly lower than generally regarded acceptable, but well within the range of response rates in similar studies (e.g. 50). The target population of elderly edentulous patients with conventional dentures is particularly difficult to reach, and response rates rarely exceed 55% (51). Additionally, edentulous patients are more likely to come from a lower socioeconomic background (52, 53), which is reflected in the results concerning the sociodemographic data, especially in the low levels of income and education. The number of incomplete responses showed that illiteracy can be a problem in this population. In relation to the size of the sample, it could be argued that responders were the ones most likely to have high impacts from poor oral health. Thus, nonresponse bias could have an impact on the findings presented in this paper.

Results concerning the respondents' OHRQOL showed that while the majority of subjects had a fair overall OHRQOL, a substantial number of patients suffered from their oral condition. More than half of the subjects experienced pain in their mouth or from dentures occasionally, fairly often, or very often. With a short reference period of 1 month, as used in this survey, acute impacts are likely to be reported. Considering the fact that survey participants have worn complete dentures for almost 20 years, this is an alarming finding. Even relatively new dentures (3 years) appear to be an inadequate treatment with regard to oral pain. About 22%, or more than a fifth of the respondents, reported that they experienced pain impacts fairly often or very often, which is an alarming finding. About a third suffered from functional limitations more than just occasionally. Around 30% also suffered from physical or psychologic discomfort. This is most likely a consequence of ill-fit, inadequate retention, and the resulting discomfort of complete dentures; a common finding in edentulous populations (20, 21, 54-56). These findings concerning the respondents' OHRQOL showed clearly that there is a need to understand how these patients' quality of life can be improved.

There are some limitations with respect to the use of the OHIP-14 instrument. This short form does not include items related to chewing, which are highly relevant to denture wearers. The OHIP-EDENT – published after completion of this survey – includes four additional items specific to edent-

ulous populations, thus avoiding a high prevalence of 'no impact' statements (57).

Modern therapeutic approaches such as fitting patients with implant-retained dentures do address the technical shortcomings of conventional denture therapy. However, they do not address how patients are affected on a psychosocial level (24, 39, 58).

This 28-item short version of the COPE (46) was developed from a longer version with 60 items (32) to reduce response burden. Research showed that the original instrument has good validity (59). However, little information is available concerning the validity of the short version, and some of the internal reliability scores were only acceptable (see Ref. 60) according to the initial validation study by Carver (46). In the current study, the reliability of all subscales was considerably better than found in the original study, and the factor structure was similar to that reported by Carver (46).

The Brief COPE results showed that the respondents did not use positive coping styles as frequently as possible. This result is interesting given the findings from the regression analyses. These findings provide empirical support for the hypothesis that self-appraised styles of coping with stressful life events such as being edentulous and having dentures strongly correlates with the respondents' OHRQOL. Almost a third of the variance within the OHIP-14 total scores was explained by inclusion of the significant coping variables in the regression model. Emotionfocused coping strategies such as behavioral disengagement, substance abuse, or denial, which are not aimed at altering the situation itself, were significant predictors of worse OHRQOL. Even seeking instrumental support, which is a problem-based coping approach focused on getting help and support from other people, was a negative predictor of the respondents' OHRQOL. By contrast, emotional support, aimed at receiving comfort and understanding from others, was the only mechanism that significantly improved OHRQOL scores. These results are similar to the findings from a Swedish study that showed that poorer coping ability measured with the Sense of Coherence (SOC) scale was significantly correlated to lower ratings of quality of life on the Sickness Impact Profile (SIP, 61). However, the SOC does not distinguish between different coping styles.

In this investigation, most of the emotionfocused coping strategies proved ineffective as

illustrated by worse OHRQOL ratings, except for getting emotional support. Nonetheless, the absence of a positive relationship of problemfocused approaches like active coping or planning with OHRQOL is surprising. Problem-focused coping styles did not contribute significantly to the regression model. This finding could be due to the fact that these problem-oriented strategies are not so commonly utilized by the respondents in the current sample, as can be seen in the results in Table 3. In addition, the mean length of the edentulous period is almost 20 years. Subjects may simply have exhausted their resources for problem focused and active coping concerning problems with their dentures. Disappointed by failed approaches to alter the situation, they may have turned to emotionfocused strategies, which, unfortunately, proved to be ineffective. Knowledge about individual deficiencies of coping with the stress of illness can be important. In particular, when clinical therapeutic interventions prove unsuccessful, appropriate counseling may be of value.

While a fairly large portion of OHRQOL was explained by coping, a number of potential sources of bias have to be acknowledged when interpreting these results. Patients provided with dentures at the beginning of the 4-year sampling period may feel different about them than those who had their dentures delivered more recently. Research showed that satisfaction with dentures falls to pretreatment levels within 2 years after delivery (62, 63). However, when controlling for the age of the dentures in the regression model, no such effect was found concerning OHRQOL in this study. Other medical factors need to be considered as confounding variables as well, particularly in elderly populations. A number of other studies have shown that comorbid medical conditions such as diabetes, arthritis, hypertension (64), or Parkinson's disease (65) significantly influence healthrelated quality of life (64-66). Chronic conditions often interact to amplify the effect of medical illness.

Conclusions

The following conclusions are drawn:

1. A substantial proportion (37.9%) of edentulous patients with conventional complete dentures reported a reduced overall OHRQOL. Over half of the patients (53.4%) reported having pain occasionally, fairly often, or very often, and over

a third of the patients reported functional limitations (39.1%), and psychologic discomfort (35.6%) due to their oral health condition.

- 2. The Brief COPE offers a way to reliably assess dental patients' styles of coping with stress in a differentiated manner.
- 3. Ineffective, emotion-focused coping strategies such as behavioral disengagement, substance abuse, denial, and religion are significant negative predictors of OHRQOL, while emotional support is a positive predictor of a patient's OHRQOL.

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