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Ich bedanke mich bei den unten aufgeführten Kolleginnen und Kollegen für ihre wertvolle Mitarbeit, die sie in den vergangenen zwei Jahren geleistet haben.

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Oral Health-Related Quality of Life in Patients with Removable Dentures

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Summary The purpose of this study was to determine factors that affected oral health-related quality of life (Oral Health Related Quality of Life = OHRQoL) in patients with removable dentures (RD). Quality of life was evaluated by using the Geriatric Oral Health Assessment Index (GOHAI). We analysed data of 250 patients aged 63 ± 11.6 years. After excluding patients lacking relevant analysis data, 243 patients remained in the study, including 129 males and 114 females. Relevant parameters for good OHRQoL were: patient satisfaction with their RD ($r = -0.317$), higher age ($r = 0.222$), greater number of remaining teeth ($r = 0.357$), higher income ($r = 0.175$), higher frequency of dental visits ($r = -0.212$), tobacco

abstinence ($r = -0.181$), and residence in a rural area ($r = -0.420$). Also, marital status had an impact on OHRQoL. Widowed and married patients showed the highest values and unmarried patients the lowest. Frequently mentioned problem areas considered within the survey were: the patient's fear of further tooth loss, concerns about functional aspects such as the decrease in chewing efficiency and dissatisfaction with the aesthetics of the dental prostheses. The results showed that the OHRQoL is apparently not only influenced by dental factors, but also by psychosocial and economic factors, the relevance of which would have to be shown in further studies.

Introduction

The current understanding of the term „quality of life“ has existed since the 1980's and has increasingly gained importance in recent years (SCHALOCK 2004). The oral health-related quality of life, respectively Oral Health Related Quality of Life (OHRQoL), presents a special aspect of this development. It was long-assumed that objective factors were decisive in determining patients' oral health-related well-being. Since collected indices for caries or periodontal disease prevalence showed only weak correlations with OHRQoL, various instruments for assessing oral health were developed.

Differences exist in the number of questions (3–46) and content focus, whereas functional aspects such as chewing, speaking, pain and aesthetics are included in most questionnaires. In Europe, the Oral Health Impact Profile (OHIP) developed

by SLADE & SPENCER (1994) is the most widely used with 46 or 14 questions. The validity of the OHIP is comparable to that of the Geriatric Oral Health Assessment Index (GOHAI) (ATCHISON & DOLAN 1990). This assessment index, which has already been used in many international studies, contains twelve questions dealing with functional and psychosocial aspects of treatment with removable dental prostheses, and relates subjective perception of dental health to the resulting quality of life (IKEBE ET AL. 2012, TUBERT-JEANNIN ET AL. 2003, LOCKER & GIBSON 2005, HAGGLIN ET AL. 2005, VEYRNE ET AL. 2005, GUZELDEMIR ET AL. 2009, HIROKO ET AL. 2010, SHIGLI & HEBBAL 2010).

Dental health in Germany has improved in recent years, which is also reflected in an increase of the number of remaining teeth in the elderly (MICHEELIS & SCHIFFNER 2006). Many patients, however, are still affected today by multiple tooth loss and the associated treatment with removable dentures.

Since healthy teeth are generally valued, daily confrontation with placing and removing the dental prosthesis with all of its possible aesthetic and functional disadvantages, often result in great reduction of subjectively perceived quality of life (FISKE ET AL. 1998, INUKAI ET AL. 2008, LOCKER & SLADE 1994).

Quality of life is also apparently affected by the extent to which one sees himself able to fully participate in desired daily life activities. These activities, in turn, are influenced by the particular social environment the person is involved in, his economic status, his responsibilities and his biological constitution (HUNT 1997, PATRICK & ERICKSON 1993). Therefore, in several ways psychosocial and socioeconomic issues appear to affect self-assessment of quality of life by influencing life expectations, as well as influencing the impact oral health and general health have on the way one leads one's life.

The wide-ranged collection of various psychosocial factors in this study that showed a correlation with the OHRQoL should be chosen for further studies to be examined in more detail.

Materials and methods

Selection of Patients

In a one year period (March 2007–April 2008) in consecutive order, a total of 250 volunteer subjects, 57 patients from a rural dental practice in the Southern Palatinate and 193 patients in the Dental, Oral and Maxillofacial Clinic in Mainz, took part in a pre-screening to evaluate the eventuality of their participation in the present study. 129 men and 114 women, 22–92 years of age (63.1 ± 11.6) gave their written consent for a follow-up screening and anonymous evaluation. The only criteria for voluntary participation in this study was that the patient had already had removable dentures for at least one year and also had removable dentures in at least one arch. The collection of data at two different locations was done firstly, to ascertain as much data in the shortest time possible and secondly to take into account, as another criterion, the differences between residence areas (rural compared with urban areas). A preview of this study was not necessary for the ethics commission because no invasive procedures were performed and all data were anonymous. The patients were divided into four age groups (< 49 years, 50–64 years, 65–70 years, > 70 years).

A questionnaire contained a patient's part, in which questions about the person, their social status, education, income, health status, tobacco use and diet were asked. This part was followed by questions having to do with dental hygiene frequency, personal oral health care, oral pain, frequency of dental visits, and satisfaction with their dentures. Response options were specified, for example for the question, "Are you satisfied with your dentures?": "yes, completely", "more or less", "no, not at all", whereby the appropriate answer had to be ticked.

Due to the fact that only patients with removable dentures would be included in the study and that most of the patients were of the older part of the population, the decision was made to use the Geriatric Oral Health Assessment Index (ATCHISON & DOLAN 1990) in its German translation (HASSEL ET AL. 2008) as an official questionnaire. The index consists of twelve questions, each with six response options (always, very often, often, sometimes, rarely, never), to which numerical values of 1–6 are assigned. By adding the responses, a numerical value of 12–72 was achieved, whereby a high numerical value was associated with a good OHRQoL. Through the analysis of individual questions, it was also attempted to identify the most frequently occurring problem areas.

In addition, detailed oral findings were collected and the Approximal Plaque Index (API), the Sulcular Bleeding Index (SBI) and the Decayed, Missing, Filled Teeth (DMF-T) were recorded. The type of prosthetic restoration was recorded, but only the value of the RD in terms of dental and laboratory efforts and not the type of partial denture (single sided, double sided or free-end) was determined. By researching patients' files, the respondent's answers were checked and, in some cases, amended regarding the age of the present dental prostheses, the patient's age with the first denture, the types and numbers of extractions and the patient's general health.

Statistical Methods

The following values were determined for the descriptive data analysis: number of samples (n), arithmetic mean (MEAN), standard deviation (STDEV), minimum (Min), maximum (Max), and median. Data were entered doubly in order to detect faulty entries and to correct accordingly. The information on age, income, number of teeth, etc., was categorized as seen in Table I and II.

To measure the strength of the association between quantitative variables, rank correlation coefficients were calculated according to Spearman (r).

To investigate the relationship between two categorical variables, cross tables were created and Fisher's Exact Tests or Chi-Square Tests of Independence were conducted to identify correlations. Fisher's Exact Test was used in the four-field tables, and the Chi-Square Test of Independence was used in multiple-field tables for referral. To analyze the relationship between a continuous and a categorical variable, the Wilcoxon test (for two categories) and the Kruskal-Wallis test (for more than two categories) were used. To investigate the association of several variables with a continuous target variable, linear regression models were created with multiple regressors to identify the main factors. For a categorical target response variable with two categories, the model of a binary logistic regression was chosen. The calculation of the data was carried out using the SPSS program for medical statistics (Version XII).

The hypothesis formulation for all tests carried out was chosen bilaterally. Since this is an exploratory analysis, p-values are understood to be descriptive and only show tendencies that should be verified in further studies.

Results

General information

Of the 250 people who participated in the study, seven were excluded due to lack of evaluation-relevant data, so that finally 243 persons were included in the analysis. The details of these 243 respondents regarding age, age groups, income, social connections, health, area of residence, marital status and diet are shown in Table I. Basic dental data such as satisfaction with or pain because of wearing dentures, dental visit behavior earlier or today, fear of dentists, oral hygiene behavior and forms of treatment can be found in Table II. Table II contains the results of different statistical test methods concerning relationships between the GOHAI and various influencing factors. Likewise, there exist internal correlations of these factors, for example, with age group, gender and smoking habits, and they are listed as far as examined.

The 81 smokers found in the study population were significantly younger than the 161 non-smokers (s: Mean $58,37 \pm 11.4$ /ns: Mean 65.47 ± 10.93 ; $p_{\text{Wilcoxon}} < 0.001$). They cleaned their teeth less frequently ($P_{\text{Chi-square}} = 0.005$), were less likely to go

to the dentist regularly and showed a marked tendency ($P_{\text{Chi-square}} < 0.001$) of irregular or pain-related dental visit behavior (Tab. I).

The survey revealed that the 114 women cleaned their teeth significantly more often than the 129 men ($P_{\text{Chi-square}} < 0.001$), and both earlier ($P_{\text{Fisher}} < 0.001$) and at the time of the survey ($P_{\text{Fisher}} = 0.005$) saw their dentist more frequently.

Dental Patient Data

Supply satisfaction and pain

Regarding satisfaction with the existing dental prostheses, younger patients tended to show more frequent dissatisfaction ($p = 0.064$) (Tab. II).

In order to find any existing relationship between frequency of pain and patient satisfaction with their dentures, the 235 patients were asked about their satisfaction levels: "yes, completely" and "more or less" ("no, not at all" was left out due to the small size category [$n = 8$]) and the two pain categories "often/once in a while in pain" ($n = 182$) and "rarely/never pain" were checked ($n = 61$).

78% of the patients found in the pain category "rarely/never" were completely satisfied with their dentures (RD) compared with 63.8% found in the pain category "often/every once in a while". Patients who suffered less pain were more satisfied ($P_{\text{Fisher}} = 0.038$) (Tab. II).

Number of remaining teeth

On average, the study participants had 7 teeth (0–22), where the maxilla (OK) had on average 2.4 teeth (0–14) and the mandible (UK) 4.6 teeth (0–14). 28.4% of the patients were completely edentulous, 29.6% had at least one edentulous arch, most often the maxilla (91.6%), least of all the mandible (8.3%), and 41.6% had remaining teeth in both arches.

The patients were divided into four groups according to the number of teeth remaining (Tab. II).

With increasing age, the total number of remaining teeth decreased ($r = -0.181$).

A higher number of remaining teeth correlated with lower age ($r = -0.181$), coming from a rural area ($p_{\text{Wilcoxon}} < 0.001$) and a higher frequency of dental visits in the past ($r = -0.180$) and present ($r = 0.440$).

The types of different prosthetic restoration forms according to the distribution and amounts are shown in Table II.

With increasing age, the percentage of patients who were treated with a complete denture in at least one arch, also rose ($P_{\text{Chi-square}} = 0.009$) (Tab. II).

Factors influencing the quality of life

The oral health-related quality of life, determined by the GOHAI, was positively affected by living in a rural area ($r = -0.420$), a greater number of remaining teeth ($r = 0.357$), the quality of prosthetic restoration ($r = -0.349$), patient satisfaction with their dental prostheses or RD ($r = -0.317$), higher age ($r = 0.222$), (here, the correlation in men [$p = 0.002$] was more pronounced than in women [$p = 0.052$]), a higher income ($r = 0.175$), a higher frequency of dental visits ($r = -0.212$) and the absence of tobacco use ($r = -0.181$).

Also, marital status had an impact on OHRQoL. The highest values here were widowed and married, and the lowest were unmarried patients (Table II). When divided into the two groups divorced/single and married/widowed, the quality of life of the first group was significantly lower than that of the second, taking into account that the former were, on average, ten years younger than the latter (Tab. II).

The less often patients felt pain due to their RD, the higher the GOHAI. However, the difference was only significant between those who "often" had pain, as opposed to those who "never" had pain ($p_{\text{Wilcoxon}} = 0.013$) (Tab. II).

With the same treatment in one arch, the GOHAI values were higher in an opposing arch telescope restoration than in a clasp retention restoration ($p_{\text{Kruskal-Wallis}} = 0.002$). Generally, high-quality and more complex dental and dental lab tech treatment was associated with a higher OHRQoL ($r = -0.349$).

Smokers had a lower subjectively perceived OHRQoL than non-smokers ($p_{\text{Wilcoxon}} = 0.002$) (Tab. I).

The presence of systemic disease, either in amount or severity, had no impact on the OHRQoL (Tab. I).

Common problem areas as they emerged from the analysis of specific issues were found in questions 1 ("Kind and amount of nutritional limitations"), 2 ("Problems biting something off"), 5 ("Without eating limitations"), 7 ("Aesthetic satisfaction"), and 9 ("Worried because of problems with teeth"). It was particularly striking that question 1 ("Kind and amount of nutritional limitations") had the 1st ranking with the adult group (43.8%) and the 8th ranking with the senior group (14.5%). "Aesthetic satisfaction" played a stronger role for the adult group (Rank 2: 56.3%) than for the other age groups (Rank 4: 28.4%–31.5%). With the exception of question 1 for the seniors, questions 1, 2, 5, 7 and 9 were represented in the first five ranks in all age groups (Tab. III).

Discussion

The aim of this study was to determine factors (OHRQoL) which influence oral health-related quality of life of patients with a reduced number of remaining teeth in at least one arch and treated with a removable RD. Psychosocial, sociodemographic and socioeconomic influences were noted, to take into consideration each patient's individuality and subjective perception of their oral situation. The Geriatric Oral Health Assessment Index (GOHAI) was used as a well-validated instrument for the detection of oral quality of life. Alternatively, one could have used the short version OHIP 14. In contrast to the short version OHIP, which is more widely used in Europe, the GOHAI includes more questions on functional aspects such as chewing, swallowing, biting off and pain. Within the psychological part of the GOHAI questionnaire, there is more focus on sociopsychological aspects with questions, for example, about contact constraints because of the dental prostheses, whereas the OHIP emphasizes the psychological condition of the patients. Data on this aspect were collected in a separate survey of the same group of patients with the Geriatric Depression Scale (GDS). The GOHAI was primarily developed for an older patient clientele, as is the aim of the present study. Unexpectedly, as the investigation also included younger subjects, the GOHAI was retained as a detection tool for the reasons mentioned above.

Both the overall quality of life as well as the oral health-related quality of life depend on many subjective factors. The level of OHRQoL depends, among other things, on how important the health of the orofacial system is to the individual, how strongly that person feels limitations in everyday life because of his oral health condition, and how he is trained in problem-solving (coping) (ALLISON ET AL. 1997).

The average GOHAI value in the present study was 72%, which is between that of a slightly younger patient population treated with partial dentures with a published value of 70%

| Tab. I General patient data in correlation to GOHAI or to age | | | | | | | | |
|---|-----|------|--------------|--|-----------------------------|----------------------|-----------------|----------------|
| | n | % | GOHAI | p-value | Additional information in % | | | |
| GOHAI | 243 | 100 | 51.9 ± 7.6 | | | | | |
| Age 63.1 (± 11.56) | 243 | 100 | | | | | | |
| 1. Adults (<56) | 32 | 13.2 | 48.8 ± 7.8 | Spearman ≤ 0.001 r = 0.222 | | | | |
| 2. Mature adults (50–64) | 88 | 36.2 | 51.2 ± 8 | | | | | |
| 3. Retirees (65–70) | 54 | 22.2 | 53 ± 8 | | | | | |
| 4. Seniors (>70) | 69 | 28.2 | 53.4 ± 4 | | | | | |
| Sex | | | | | | | | |
| ♂ | 129 | | 52.4 ± 7.3 | Wilcoxon = 0.394 | | | | |
| ♀ | 114 | | 51.4 ± 7.9 | | | | | |
| Smokers | | | | | | | | |
| Yes | 81 | 33.3 | 49.8 ± 8.5 | Wilcoxon = 0.002 | | | | |
| No | 162 | 66.7 | 52.9 ± 7 | | | | | |
| Income | | | | | | | | |
| < 1,000 € | 80 | 32.9 | 49.8 ± 7.8 | Spearman = 0.006 r = 0.175 | | | | |
| 1,000–2,000 € | 122 | 50.2 | 52.6 ± 7.2 | | | | | |
| 2,000–3,000 € | 28 | 11.5 | 53.6 ± 8 | | | | | |
| > 3,000 € | 13 | 5.3 | 54.7 ± 7 | | | | | |
| < 2,000 € | 202 | 83.1 | | Wilcoxon = 0.48 | | | | |
| > 2,000 € | 41 | 16.8 | | | | | | |
| Education | | | | | | | | |
| High school | 159 | 65.4 | 52.1 ± 7.7 | r = -0.045 Spearman = 0.484 | | | | |
| High School Graduation | 65 | 26.7 | 51.4 ± 7.5 | | | | | |
| High School Diploma | 4 | 1.6 | 50.25 ± 12.7 | | | | | |
| University Degree | 15 | 6.2 | 52.5 ± 7 | | | | | |
| Marital Status | | | | | Adults | Mature adults | Retirees | Seniors |
| Single | 10 | 4.1 | 44.4 ± 4.7 | Kruskal-Wallis = 0.003 | 21.9 | 0 | 1.9 | 2.9 |
| Married | 179 | 73.7 | 52.1 ± 7.7 | | 53.1 | 76.1 | 75.9 | 78.3 |
| Widowed | 30 | 12.3 | 53.8 ± 6.9 | | 3.1 | 11.4 | 14.8 | 15.9 |
| Divorced | 24 | 9.9 | 51.3 ± 6.9 | | 21.9 | 12.5 | 7.4 | 2.9 |
| Successful partnership | 209 | | 52.4 ± 7.6 | Wilcoxon = 0.014 | | | | |
| None or failed partnership | 34 | | 49.3 ± 7 | | | | | |
| Social Contacts | | | | | | | | |
| Regularly/seldom | 76 | 31.3 | 52.2 ± 7.8 | Spearman = 0.122 Wilcoxon = 0.094 (regularly/seldom) | 40.6 | 35.2 | 35.2 | 18.8 |
| Satisfactory/regularly | 103 | 42.4 | 52.8 ± 7.6 | | 25 | 34.1 | 48.1 | 56.5 |
| Seldom | 64 | 26.3 | 50.3 ± 7 | | 34.4 | 30.7 | 16.7 | 24.6 |
| Residence | | | | | | | | |
| Urban | 186 | | 50.2 ± 7.4 | r-Spearman = -0.420 Spearman ≤ 0.001 | | | | |
| Rural | 57 | | 57.5 ± 5.5 | | | | | |
| Health Insurance | | | | | | | | |
| Private | 24 | | 54.2 ± 6.6 | Wilcoxon = 0.078 | | | | |
| Compulsory | 213 | | 51.5 ± 7.7 | | | | | |

Tab. I General patient data in correlation to GOHAI or to age (continued)

| | n | % | GOHAI | p-value | Additional information in % | | | |
|------------------|----|------|------------|------------------|-----------------------------|---------------|----------|---------|
| General Diseases | | | | | Adults | Mature adults | Retirees | Seniors |
| One | 93 | 38.3 | | Spearman = 0.574 | 15.6 | 43.2 | 44.4 | 37.7 |
| Two | 60 | 24.7 | 51.9 ± 7.4 | | 15.6 | 18.2 | 25.9 | 36.2 |
| Three | 19 | 7.8 | | | 0 | 4.5 | 13 | 11.6 |
| More than three | 4 | 1.6 | | | 3.1 | 1.1 | 0 | 2.9 |
| None | 67 | 27.6 | 51.9 ± 7.9 | | 65.8 | 33 | 16.7 | 11.6 |

Tab. II Dental patient data in correlation to GOHAI or in some cases also to age, gender and smoking habits of the patients

| | n | % | GOHAI | p-value | Additional information in % | | | |
|--|-----|------|------------|---|-----------------------------|---------------|-----------------------------|-------------------|
| Number of Remaining Teeth | | | | | Adults | Mature adults | Retirees | Seniors |
| > 15 | 38 | 15.7 | 56.5 ± 7.7 | Spearman < 0.001 r-Spearman = 0.357 | | | | |
| 10–15 | 34 | 14 | 54.8 ± 7 | | | | | |
| 5–10 | 49 | 20.3 | 50.7 ± 7.3 | | | | | |
| < 5 | 121 | 50 | 50.2 ± 7.2 | | | | | |
| Edentulous | | | | | 18.8 | 19.5 | 42.6 | 33.3 |
| > 10 zu < 10 | | | | Wilcoxon < 0.001 | | | | |
| Satisfaction with Dentures | | | | | Av. age | | | |
| Yes, completely | 175 | 72 | 53.3 ± 7.6 | Spearman ≤ 0.001 r-Spearman = -0.317 | 64 ± 11.4 | | | |
| More or less | 60 | 24.7 | 49 ± 6.4 | | 61.9 ± 11.7 | | | |
| No, not at all | 8 | 3.3 | 44.3 ± 7.3 | | 53.1 ± 10.9 | | | |
| Pain Caused by Prosthesis | | | | | | | | |
| Never | 28 | 11.5 | 52.6 ± 9 | Spearman = 0.13 | | | | |
| Seldom | 154 | 63.4 | 52.2 ± 7.7 | | | | | |
| Sometimes | 56 | 23 | 51.8 ± 6.4 | | | | | |
| Often | 5 | 2.1 | 42.8 ± 5 | | | | | |
| Never | 28 | 11.5 | 52.6 ± 9 | Wilcoxon = 0.013 | | | | |
| Frequently | 5 | 2.1 | 42.8 ± 5 | | | | | |
| Dental Visit Frequency, Earlier | | | | | ♀ n = 114 | ♂ n = 129 | | |
| Twice a year | 1 | 0.4 | | | 0.9 | 0 | | |
| Once a year | 138 | 56.8 | | | 70.2 | 45 | | |
| Every two years | 4 | 1.6 | | | 1.8 | 1.6 | P _{Fisher} < 0.001 | |
| Irrregularly | 72 | 29.6 | | | 21.1 | 37.2 | | |
| Only in case of pain | 28 | 11.5 | | | 6.1 | 16.3 | | |
| Dental Visit Frequency, Today | | | | | ♀ | ♂ | Smoker | Non-smoker |
| | | | | | | | Av. age 58.4 | Av. age 65.5 |
| Twice a year | 14 | 5.8 | 54 ± 8.2 | Spearman ≤ 0.001 r-Spearman = 0.212 | | | 3.7 | 6.8 |
| Once a year | 138 | 56.8 | 53 ± 8 | | 71.9 | 54.3 | 42 | 64.2 |
| Irrregularly | 40 | 16.5 | 49.4 ± 6.2 | | P _{Fisher} = 0.005 | | 29.6 | 9.9 |
| Only in case of pain | 47 | 19.3 | 50.2 ± 7 | | 13.2 | 24.8 | 23.5 | 17.3 |

Tab. II Dental patient data in correlation to GOHAI or in some cases even to age, gender and smoking habits of the patients (continued)

| | n | % | GOHAI | p-value | Additional information in % | | | |
|---|-----|------|------------|--|-----------------------------|---------------|------------------------|----------------------------|
| Dental Fear | | | | | ♀ | ♂ | Smoker Av. age 58.4 | Non-smoker Av. age 65.5 |
| Yes | 110 | 45.2 | 50.5 ± 8 | Wilcoxon = 0.175 | 59.6 | 32.6 | | |
| No | 133 | 53.8 | 52.7 ± 7.5 | | 40.4 | 77.4 | | |
| Dental care | | | | | | | | |
| Every few days | 9 | 3.7 | 49.8 ± 7.6 | ♂ r-Spearman = 0.185 ♂ Spearman = 0.036 ♀ Spearman = 0.065 | 2.6 | 4.7 | 7.4 | 1.9 |
| Once a day | 74 | 34.1 | 52.4 ± 7.5 | | 14 | 51.9 | 44.4 | 29 |
| Twice a day | 120 | 49.4 | 52.0 ± 7.8 | | 83.4 | 43.2 | 40.7 | 53.7 |
| More than twice a day | 31 | 12.8 | 51.2 ± 7.5 | | 20.2 | 6.2 | 7.4 | 15.4 |
| Type of Restoration | | | | | Adults | Mature adults | Retirees | Seniors |
| Partial denture Upper/lower arch | 101 | 40.6 | 54.3 ± 7.5 | r-Spearman = 0.297 Spearman ≤ 0.001 | | | | |
| Full denture, one arch | 75 | 30.5 | 51.3 ± 7.6 | | 34.4 | 57.3 | 68.5 | 65.2 |
| Full dentures, both arches | 66 | 27.2 | 49.0 ± 6.9 | | | | | |
| No data available | 4 | 1.6 | | | | | | |
| Treatment Form | | | | | | | | |
| Fixed/Tele 3 Contact points | 24 | 9.9 | 55.5 ± 7.8 | r-Spearman = -0.349 Spearman ≤ 0.001 | | | | |
| Fixed/Retention Clasp 4 Contact points | 16 | 6.6 | 54.7 ± 8.6 | | | | | |
| Tele/Tele 4 Contact points | 16 | 6.6 | | | | | | |
| Fixed/Total 5 Contact points | 9 | 3.7 | | | | | | |
| Tele/Retention Clasp 5 Contact points | 13 | 5.8 | 55.1 ± 6.8 | | | | | |
| Tele/Total 6 Contact points | 36 | 14.8 | | | | | | |
| Retention Clasp/Retention Clasp 6 Contact points | 32 | 13.2 | 52.4 ± 7.4 | | | | | |
| Retention Clasp/Total 7 Contact points | 27 | 11.3 | 49.4 ± 5.6 | | | | | |
| Total/Total 8 Contact points | 66 | 27.2 | 49.0 ± 6.9 | | | | | |
| No data available | 4 | 1.6 | | | | | | |

(TUBERT-JEANNIN ET AL. 2003) and that of a slightly older patient population treated with full dentures with a value of 76% (VEYRUNE ET AL. 2005).

In most studies, the number of remaining teeth is considered to be the strongest factor of OHRQoL (TUBERT-JEANNIN ET AL. 2003, JOHN ET AL. 2004, HAGGLIN ET AL. 2005), which was also evident in the present study, next to age correlation. This is not in contradiction to decreasing numbers of teeth in old age, but means that the OHRQoL of denture patients is generally better at an older age, especially in those patients having more remaining teeth. Patients with more than ten remaining teeth had a much higher OHRQoL than those with less than ten teeth. This may be due to the limited treatment possibilities which are much more difficult to implement, with less remaining teeth, into functional and aesthetically pleasing solutions. The resulting treatment options also showed an influence on

the quality of life. Patients with partial prosthetic treatment in both arches had generally a higher OHRQoL than those with a full denture treatment in one or both arches, as corresponds to the results of JOHN ET AL. (2004).

The more satisfied the patients were, the higher the OHRQoL. The most frequent reason for dissatisfaction with the dentures were aesthetics, reported by three-quarters of all dissatisfied patients. In moderately satisfied patients, aesthetics were in second place with 60% of reasons for limited satisfaction. Even in the completely satisfied patients, a fifth of those who answered the GOHAI questionnaire were dissatisfied with the aesthetics of their dentures. Although, with increasing age, proven functional aspects displace the importance of aesthetic aspects, and dissatisfaction by the patient population studied here with an average age of 63 years was connected in a surprisingly high degree to aesthetics.

Tab.III "Problem Areas": Percentage of responses "often to always" or to questions 3, 5 and 7 "sometimes to never" related to the different age groups with the problem rankings in each age group.

| GOHAI-Questions | Adulthood <49 years; n=32 Prevalence in %/ Ranking | Mature adulthood 50–64 years; n=88 Prevalence in %/ Ranking | Retirement age 65–70 years; n=54 Prevalence in %/ Ranking | Seniors >70 years; n=69 Prevalence in %/ Ranking |
|---|---|--|--|---|
| 1. "Kind and amount of nutritional limitations" | 43.8%/5 | 36.4%/4 | 24.1%/5 | 14.5%/8 |
| 2. "Problems biting something off" | 56.3%/2 | 54.5%/1 | 37%/2 | 43.5%/1 |
| 5. "Without eating limitations" | 53.1%/4 | 47.7%/3 | 37%/2 | 34.8%/3 |
| 7. Aesthetic satisfaction | 56.3%/2 | 28.4%/4 | 31.5%/4 | 29%/4 |
| 9. "Worried because of problems with teeth" | 65.6%/1 | 54.5%/1 | 48.1%/1 | 40.6%/2 |
| 10. Nervous and unsure because of teeth | 37%/6 | 22.7%/7 | 24.1%/5 | 15.9%/6 |

Another striking correlation with the OHRQoL was the residential area. The patients from the rural practice had, on average, better GOHAI values, which has also been confirmed by other investigators (JOHN ET AL. 2004). This may be due to a less demanding attitude toward having RD, or having better problem-solving strategies including, for example, a better social support system.

In some international cross-sectional studies, the reduction of OHRQoL is related to aging (TUBERT-JEANNIN ET AL. 2003, HAGGLIN ET AL. 2005). In the present study, this was not true, but the opposite was the case. One reason for this lies in our study design. Since patients with fixed restorations in both arches were not included in the study, there is not a representative cross-section of the population.

Patients treated with partial and full dental prosthetics had an increase in quality of life with increasing age as confirmed by JOHN ET AL. (2004). According to the fourth German Oral Health Study (DMS IV), the prevalence of adult patients wearing dental prostheses was 5% (full dentures 1%) compared to 59% in elderly patients (full dentures 31%). Because the majority of denture wearers are older in age, it is apparently easier to accept this as a normal condition. Younger aged denture wearers are in a minority and therefore feel particularly restricted in their quality of life. Forgetting the edentulous situation is already made impossible by daily cleaning of the dentures. Because tooth loss is generally associated with aging, this confrontation therefore means a greater loss of quality of life, especially concerning younger people.

As described in other studies (TUBERT-JEANNIN ET AL. 2003, JOHN ET AL. 2004), no obvious differences were shown in OHRQoL between women and men. Men tended to have higher GOHAI values, although women had more teeth, saw their dentist more frequently and had better oral hygiene. Women seem to take their oral health more seriously and value it more critically than men, so that they already feel significantly limited in their quality of life even with minimal tooth loss.

Social contacts and marital status, as well as material well-being are among the eight key factors of quality of life listed by SCHALOCK (2004) in an analysis of over 2000 articles. In the present study, the frequency of social contacts showed no apparent correlation to OHRQoL, whereas the above results could

be confirmed for marital status. It should be noted with some restrictions that the ranking of family status shows the highest GOHAI values for widowed, followed by married, and the lowest values for divorced patients. These values decreased with the average age of the patients, which certainly influenced the results.

The influence of material well-being on the quality of life described several times in the literature was also confirmed (TUBERT-JEANNIN ET AL. 2003, SCHALOCK 2004, JOHN ET AL. 2004, LOCKER & GIBSON 2005). The clarity of the correlation even increased when income climbed to over 2,000 €. This amount thus represented a socioeconomic satisfaction threshold below and above which the GOHAI values changed only slightly. LOCKER & GIBSON (2005) spoke of a "subjectively-perceived as adequate income" in this context.

The statement that general health status has a certain relationship to quality of life, but that the presence of illness does not necessarily have to have a negative impact on it (LOCKER & SLADE 1994), was also evident in the present study. Healthy and sick patients showed no differences in GOHAI values. Also, the severity of the disease had no influence on the GOHAI values. The values of those patients who had a potentially lethal disease such as malignant neoplasms, ran even higher than those of the other patients. Apparently limitations in function and aesthetics of the oral system, given the severity of the disease, simply lose importance. RÖSLER ET AL. (1996) concluded with similar results, that the perception and the way of dealing with the disease had more impact on quality of life than the actual severity of the disease. Correlations between OHRQoL and the subjective assessment of their own health that take into consideration individual perception and coping factors have been described in many studies as being significant (TUBERT-JEANNIN ET AL. 2003, HAGGLIN ET AL. 2005, LOCKER & GIBSON 2005) but weren't used in the present study because only the health history questionnaire and follow-up clarification of disclosed answers were collected and not the subjective assessment and evaluation.

Finally rankings were created under the specific questions to clarify specific problem areas within the GOHAI survey. The highest percentage of negative responses were given to the question on how often patients were worried about their teeth.

The values found here of 50.6% are still below those of HAGGLIN ET AL. (2005) and IKEBE ET AL. (2012) whose studies indicated values of 57% and 57.6%. It is understandable that most patients treated with partial dentures fear further tooth loss because often limitations in functional and aesthetically sufficient treatment are reached. In accordance with JOHN ET AL. (2004), the next two functional categories were most prevalent. The decrease in chewing efficiency associated with tooth loss and the daily confrontation with this constraint represented important quality of life factors for the patient. A third of the surveyed patients ranked "dissatisfaction with the aesthetics" of the prosthesis in the fourth position, although this had to do with an older patient population (Ø 63 years).

The results of the above study underscore the multi-factorial concepts of oral quality of life. It was found that beyond dental and dental technical factors, various psychosocial factors influence the subjective perception of oral health-related quality of life and should be taken into account in the planning and subsequent evaluation of treatment success.

Résumé

Cette étude avait pour but de déterminer les paramètres ayant une influence sur la qualité de vie en relation avec la santé orale (Oral Health Related Quality of Life = OHRQoL) définie par le Geriatric Oral Health Assessment Index (GOHAI) chez les pa-

tients porteurs de prothèses amovibles. Des 250 personnes de $63 \pm 11,6$ ans interrogées initialement, sept ont dû être exclues par manque de données nécessaires à l'évaluation. Au total, 243 patients, 129 ♂ et 114 ♀ ont été inclus dans l'étude.

Parmi les paramètres ayant une influence significative sur la bonne qualité de vie de la santé orale (OHRQoL), on retrouve 1) la satisfaction des patients avec leur prothèses dentaires ($r = -0,317$), 2) un âge plus élevé ($r = 0,222$), 3) un plus grand nombre de dents restantes ($r = 0,357$), 4) un revenu plus élevé ($r = 0,175$), 5) des visites chez le dentiste plus fréquentes ($r = -0,212$), 6) être non fumeur ($r = -0,181$) et 7) vivre dans une région rurale ($r = 0,420$).

L'état civil du patient a aussi démontré une influence sur la OHRQoL. Les valeurs d'indices GOHAI les plus élevées étaient pour les patients veufs ou mariés, les résultats les plus bas chez les célibataires.

Les problèmes ressentis comme essentiels dans l'ordre d'importance étaient la peur de perdre encore des dents, des aspects fonctionnels comme la perte d'efficacité de la mastication et le mécontentement avec l'esthétique des prothèses amovibles.

Les résultats font voir que l'OHRQoL est influencée non seulement par des facteurs liés à la médecine dentaire, mais également par des considérations psychosociales et économiques. Des recherches futures devront encore établir la pertinence réelle de chacun de ces facteurs.

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