

The Relationship Between Denture-Wearing and the Geriatric Oral Health Assessment Index in a Group of Institutionalised Romanian 65-74 Year Olds

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Abstract

Aim: The aim of this study was to determine the relation between prosthetic status and quality of life of a group of institutionalised 65-74 year olds using the Geriatric Oral Health Assessment Index. **Methods:** In 2010, a cross-sectional survey was conducted in Iasi, Romania, among a convenience sample of 161 residents aged 65-74 years from the St. Parascheva Retirement Centre (118 [73%] females, 43 [27%] males). They were divided in three groups according to the type of prostheses: Group 1=people with complete dentures, Group 2=people with removable partial dentures, and Group 3=people with fixed or no prostheses. The subjects were clinically examined according to World Health Organization 1997 criteria by two calibrated dentists and their oral health-related quality of life was assessed using the Geriatric Oral Health Assessment Index (GOHAI) questionnaire. Ethical approval for the study was obtained from the relevant authority. The resulting data were entered in to a statistical software program, for a statistical significance threshold at $P<0.05$. Analysis was performed using the Kruskal-Wallis test and Spearman's rank correlation coefficient. **Results:** The most affected quality of life dimension was discomfort when eating any kind of food, reported by 110 (68%) of subjects, most of them for Group 1 (n=55, 34%). Social limitation was less of a problem, with 22 (14%) reporting that they did not feel comfortable eating in front of others. The least affected items were the need to use medication for oral pain, reported by only three (2%) subjects, and problems with swallowing comfortably, reported by only one (1%) subject. When comparing the three groups of subjects with the Kruskal-Wallis test, the most numerous negative answers were given by the patients with removable prostheses, first of all by the totally edentulous (Group 1), followed by the partially edentulous (Group 2). Spearman correlation analysis showed a statistically significant correlation between the clinical indicator: groups according to prosthesis status and GOHAI 1 and GOHAI 5, which relate to physical limitation and oral discomfort ($r=0.583$ and $r=0.576$, respectively). Social indicators such as *gender* and *age* had a moderate correlation with GOHAI 1, which relates to physical dimension ($r=0.356$ and $r=0.240$, respectively). For social (GOHAI 6) and psychological dimensions (GOHAI 9), there was only a significant correlation with social indicator *age* ($r=0.389$). **Conclusions:** In the subjects studied, wearing complete or partial removable dentures was a better predictor of a negative impact on quality of life of institutionalised 65-74 year olds in Iasi, Romania, than social and psychological indicators.

Key Words: Quality of Life, Dentures Wearing, 65-74 Year Olds, Geriatric Oral Health Assessment Index

Introduction

The elderly represent a special category in the population, not only because of the consequences of specific disease and conditions, but also because they often have restricted access to medical care, including dental care. This group can also experience certain restrictions that modify their life styles and mental status, which may affect their social interactions, thus affecting their quality of life [1].

In a USA population, Inglehart and Bagramian (2002) considered three oral factors that influenced elderly people's quality of life. These were the absence of pain, the ability to maintain good oral hygiene, and the absence of oral infections [2].

Oral health influences daily activities of old people at the level of physical or psycho-social interactions, and their physical and physiological characteristics affect quality of life differently from

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younger people. Thus, special instruments for the evaluation of the quality of life in this population group are required [3]. One of these, the Geriatric Oral Health Assessment Index (GOHAI), has been validated and widely used in North America [4]. Its internal consistency is satisfactory and its validity has been confirmed in a number of countries including Malaysia [5], Germany [6], France [7] and Arabic countries [8], where local versions have shown acceptable reliability and validity [5-8].

The GOHAI questionnaire (Atchison & Dolan, 1990)[4] consists of 12 questions that reflect aspects considered as having an impact on the dimensions of life quality of the elderly population, such as functional limitation, lack of aesthetic satisfaction, chewing discomfort and avoidance of certain foods, avoidance of social contact, and self-medication for dental pain. Answers are graded using the scale 0=never, 1=seldom, 2=sometimes, 3=often, 4=very often [4]. The Romanian (GOHAI-Ro) version was validated at the Grigore T. Popa University of Medicine and Pharmacy Iasi, Romania, after a pilot study demonstrated acceptable reliability [9].

Aim

The aim of this study was to determine the relation between type of prostheses and quality of life of a group of institutionalised 65-74 year olds using the GOHAI.

Methods

This cross-sectional study was conducted in 2010. Two calibrated dentists collected oral health information according to the World Health Organization 1997 criteria [10]. A convenience sample of 161 residents, aged 65-74 years, from the St. Parascheva Retirement Centre in Iasi, Romania, were recruited into the study. The total number of residents in this retirement centre was 207. The sample of 161 was divided into three groups according to the type of prostheses they wore: Group 1 consisted of people with no natural teeth and complete dentures—45 (28%), Group 2 of people with some natural teeth and removable partial dentures—65 (40%), and Group 3 of people with fixed or no prosthesis—51 (32%).

Fourteen people with terminal cancer and 32 with other terminal illnesses declined to participate in the study. Details of each subject's age and gender and were recorded. They were then clinically examined. After the clinical examination, they

were asked to complete the GOHAI-Ro questionnaire. The data were entered into a statistical software program (SPSS 17; SPSS Inc, Chicago, USA). The association between life quality, evaluated through the GOHAI-Ro questions, and oral status was assessed using the Spearman correlation analysis concerning, on one side, the physical dimension, pain and discomfort dimension and psycho-social dimension of the quality of life and, on the other side, the clinical and socio-demographic indicators. Statistical significance was set at the level $P>0.05$ using the Kruskal-Wallis test.

Approval for the study was obtained from the ethics commission of the Grigore T. Popa University of Medicine and Pharmacy Iasi, Romania.

Results

The demographic and clinical characteristics of the 65-74 year olds, including gender distribution, age, and denture status, are presented in *Table 1*. Of the 161 who consented to take part in the study, Group 1 consisted of 45 people (28% of the sample), Group 2 of 65 people (40% of the sample), and Group 3 of 51 people (32% of the sample) (*Table 1*).

Table 1. Demographic and clinical characteristics of the sample

Variables	Number	%
Gender		
Male	43	27%
Female	118	73%
Age		
65-70 years	91	56%
71-74 years	70	44%
Group 1	45	28%
Complete dentures		
Group 2	65	40%
Partial removable dentures		
Group 3	51	32%
Fixed prostheses		

The negative responses to the GOHAI-Ro items by the participants and the most serious problems (responses with *often* and *very often*) were reported as follows:

- 104 (65%) of the respondents reported limitations in eating hard foods (GOHAI 1): over half were from Group 1 (53; 33%), followed by Group 2 (39; 24%), and, finally, Group 3 (12; 8%).

- 108 (67%) reported chewing problems with hard foods (GOHAI 2). The highest number (52; 32%) was from Group 1, people with no natural teeth, followed by subjects from Group 2 (45; 28%).
- 110 (68%) reported that they felt discomfort when eating certain foods (GOHAI 5); people from Group 1 had the most frequently negative answers (55; 34%).

Social dimensions were less affected; only 14 (9%) reported limited contact with people (GOHAI 6). No one with crowns but no denture responded negatively. Only three (2%) with natural teeth (Group 3) reported that they either often or very

often used medication to relieve oral pain (GOHAI 8) (Table 2).

As far as the quality of life dimensions were concerned, the most affected dimensions (responses with *often* and *very often*) were physical dimension (GOHAI 1, 2), followed by pain and discomfort (GOHAI 5, 8, 12). The least affected related to psychological and social limitation (GOHAI 6, 8, 11) (Table 2).

The answers given by the subjects from the three study groups were compared using the Kruskal-Wallis test. The results were not statistically significant for questions 3, 4, 9 and 10 ($P>0.05$). The differences were statistically significant for the other questions, $P<0.05$ (Table 3).

Table 2. Negative item responses (often+very often)

GOHAI-Ro items	Number (Nr)		Group 1		Group 2		Group 3	
	Nr	%	Nr	%	Nr	%	Nr	%
1. Limit the kinds of food	104	65%	53	33%	39	24%	12	8%
2. Trouble biting or chewing	108	67%	52	32%	45	28%	11	7%
3. Problems swallowing comfortably	1	1%	1	1%	0	0%	0	0%
4. Problems speaking clearly	24	15%	14	9%	10	6%	0	0%
5. Discomfort when eating any kind of food	110	68%	55	34%	40	25%	15	9%
6. Limit contact with people	14	9%	9	6%	5	3%	0	0%
7. Unsatisfied with look of teeth	77	48%	11	7%	22	14%	44	27%
8. Used medication to relieve pain	3	2%	0	0%	0	0%	3	2%
9. Worried about teeth, gums or dentures	75	46%	31	19%	24	15%	20	12%
10. Self-conscious of teeth, gums or dentures	61	38%	22	14%	22	14%	17	10%
11. Uncomfortable eating in front of others	22	14%	13	8%	6	4%	3	2%
12. Sensitive to hot, cold or sweet foods	33	21%	0	0%	11	7%	22	14%

Table 3. Kruskal-Wallis analysis

GOHAI-Ro items	P value	Group 1		Group 2		Group 3	
		Nr	%	Nr	%	Nr	%
1. Limit the kinds of food	0.01	53	33%	39	24%	12	8%
2. Trouble biting or chewing	0.01	52	32%	45	28%	11	7%
3. Problems swallowing comfortably	0.53	1	1%	0	0%	0	0%
4. Problems speaking clearly	0.56	14	9%	10	6%	0	0%
5. Discomfort when eating any kind of food	0.01	55	34%	40	25%	15	9%
6. Limit contact with people	0.02	9	6%	5	3%	0	0%
7. Unsatisfied with look of teeth	0.04	11	7%	22	14%	44	27%
8. Used medication to relieve pain	0.02	0	0%	0	0%	3	2%
9. Worried about teeth, gums or dentures	0.76	31	19%	24	15%	20	12%
10. Self-conscious of teeth, gums or dentures	0.57	22	14%	22	14%	17	10%
11. Uncomfortable eating in front of others	0.02	13	8%	6	4%	3	2%
12. Sensitive to hot, cold or sweet foods	0.04	0	0%	11	7%	22	14%

The Spearman correlation was used to analyse possible relationships between GOHAI-Ro dimensions and the clinical and the socio-demographic variables: *groups*, *age* and *gender distribution* (Tables 4, 5, and 6).

The highest values of association were encountered for the GOHAI 1 (limit the kinds of food), $r=0.583$, and GOHAI 5 (discomfort eating hard foods), $r=0.576$, with the clinical indicator: Group 1 (people with no natural teeth and wear total dentures) all at the $P=0.001$ level (Tables 4 and 5).

The social indicator *gender* had a statistically significant association only with the GOHAI 1, $r=0.356$ ($P=0.001$) and GOHAI 5 $r=0.313$ ($P=0.006$) (Tables 4 and 5). The social indicator *age* only showed a statistically significant association for the GOHAI 9 question (worried about teeth, gums or dentures) as this was with the psychological dimension of quality of life, $r=0.389$ ($P=0.004$) (Table 6).

No significant correlation was found between Group 3 (control group) and physical, oral pain, and socio-psychological dimensions.

Discussion

The terms of “quality of life” and “health-related quality of life” defy simple definitions, although

they are used widely in various contexts associated loosely with the impact of disease and health on personal experiences. There are similar problems with the term “oral health-related quality of life”, which is used to describe the impact of oral health on a patient’s personal experiences [11].

Analysis of the answers to the questionnaires used in the current study indicated that most of the functional problems of the respondents were caused by reduced or even no consumption of hard foods (GOHAI 1). The fairly high percentage of 65% could be explained by the high percentage of edentulous patients not treated, or with inadequate prosthetic treatment, as the absence of adequate treatment causes negative effects on chewing. The percentage (65%) found in the present study is higher than one found by a study in Saudi Arabia (43%) [8] and much higher than the one from the study for the validation of the GOHAI questionnaire in Malaysia (13%) [5]. The correlation with question 5, evaluating the discomfort caused by the consumption of such foods, is obvious; it was reported by 68% of the respondents, and this value is higher than the one found in a study in Saudi Arabia, where 42% of the elderly reported the same discomfort [12], and in Germany, where a study reported the percentage as only 12% [6].

Table 4. Spearman correlation between physical dimension and clinical and social indicator

GOHAI-Ro dimension	Clinical indicators			Social indicators	
	Group1	Group 2	Group 3	Age	Gender
PHYSICAL DIMENSION					
Limit kinds of food (GOHAI 1)	$r=0.583$ $P=0.001$	$r=0.455$ $P=0.001$	$r=0.012$ $P=0.451$	$r=0.240$ $P=0.002$	$r=0.356$ $P=0.001$

Table 5. Spearman correlation between pain and discomfort dimension and clinical and social indicators

GOHAI-Ro dimension	Clinical indicators			Social indicators	
	Group1	Group 2	Group 3	Age	Gender
PAIN and DISCOMFORT					
Discomfort when eating any kind of food (GOHAI 5)	$r=0.576$ $P=0.001$	$r=0.416$ $P=0.001$	$r=0.0341$ $P=0.267$	$r=0.120$ $P=0.453$	$r=0.313$ $P=0.006$

Table 6. Spearman correlation between psycho-social dimension and clinical and social indicators

GOHAI-Ro dimension	Clinical indicators			Social indicators	
	Group1	Group 2	Group 3	Age	Gender
PSYCHOLOGICAL DIMENSION					
Worried about teeth, gums or dentures (GOHAI 9)	$r=0.067$ $P=0.233$	$r=0.178$ $P=0.587$	$r=0.223$ $P=0.028$	$r=0.389$ $P=0.004$	$r=0.233$ $P=0.245$
SOCIAL DIMENSION					
Limit contact with people (GOHAI 6)	$r=0.116$ $P=0.321$	$r=0.113$ $P=0.0211$	$r=0.278$ $P=0.0311$	$r=0.342$ $P=0.067$	$r=0.038$ $P=0.738$

When comparing the three groups of subjects, we found that the most numerous negative answers were given by the patients with prosthetic treatments, first of all by the totally edentulous ones from Group 1, followed by the partially edentulous ones from Group 2. This trend was reported by Shgliand and Hebbal (2010) in India and by Veyrune *et al.* (2005) in France [13,14]. Furthermore, the French authors found a correlation between the GOHAI scores and new prosthetic treatments, explained by the improvement of the chewing coefficient. In contrast, in Brazil, Bonan *et al.* (2008) did not find statistically significant differences in the quality of life of elderly people relating to the type of prosthetic treatment [15].

In the present study, the answers for which no statistically significant difference was found were those related to the ability to swallow comfortably (GOHAI 3, $P=0.526$) and to speak clearly (GOHAI 4, $P=0.559$), irrespective of the patients' prosthetic treatment. Other questions for which no statistically significant differences were found were those related to being worried about the oral health status (GOHAI 9, $P=0.761$) or to feeling self-conscious about oral health status (GOHAI 10, $P=0.573$), which were perceived similarly, irrespective of the prosthetic treatment type.

The psychological dimension of the quality of life was much less affected in the present study than in a previous study in Malaysia [5]. In this Malaysian study, 53% reported that they felt self-conscious about teeth, gums or dentures whereas in the current study only 38% of the subjects reported this psychological feeling. This percentage is almost the same as that found in a group of elderly people in Sweden (36%) for the same items [16].

Social integration was less important for the population in this study, as only 14% reported negative effects on this aspect, such as uncomfortable eating in front of someone else (GOHAI 11). In a study in Jordan, the percentage was 42% [8], whereas in a study in Germany it was only 8% [6].

A weaker correlation was found between functional limitation (GOHAI 1, GOHAI 5) and social indicators, such as *gender distribution* ($r=0.356$, $r=0.313$, respectively). The same trend was seen for the social indicator *age*, which correlated positively but more weakly with questions GOHAI 1 ($r=0.240$) and GOHAI 9 ($r=0.389$). This leads to the hypothesis, underlined by other studies, that clinical indicators are better predictors of the quality of life than demographical ones [17,18]. Thus,

studies in Germany with Oral Health Impact Profile indicated that the risk of having a poor quality of life is 7.5 times higher in subjects with dentures than in subjects without such treatment [19].

It is known that oral impairment and disability are almost inevitably features of old age, but they do not necessarily have a negative impact on one's quality of life. In a study in China, (McMillan and Wong, 2003), it was found that 69% of the edentulous subjects over 60 years of age were satisfied with their dentures and eating in public; avoiding going out was a less common problem [20]. However, in an Australian study Steele *et al.* (2004) demonstrated that age is an important indicator for decreasing quality of life [21]. In our study, we demonstrated that *age* and *gender* did not affect the social dimension of quality of life and the psychological dimension was affected only by *age*.

Promotion of oral health in institutionalised elderly communities represents a priority for public health in Romania, because of the fact that motor and physiological problems are likely to affect their quality of life in a different manner to that seen in younger people.

Conclusions

In the group of 65-74 year olds that were studied:

1. The most affected dimensions of quality of life for institutionalised elders were the physical ones, expressed through avoidance of hard foods and chewing discomfort.
2. These dimensions had higher associations with the clinical indicators than with the social and demographic ones.
3. The least-affected dimensions of the quality of life for this population group were associated with social and psychological dimensions.
4. The type of prosthetic treatment (fixed or removable denture) was an important predictor in the assessment of the quality of life in elderly patients. Patients with complete removable dentures were the most affected, and patients with fixed prostheses (bridges and crowns) were the least affected.

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Contribution of each author

Both authors performed the clinical examinations and supervised the completion of the questionnaires by the respondents.

AM: performed the literature review and wrote the paper.

CH: performed the statistical analysis and reviewed the paper.

Statement of conflict of interests

The authors are no aware of any conflict of interests

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