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Is OHIP-EDENT similar to GOHAI when Measuring Ohrqol in Partial and Complete Denture Wearers?

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Abstract

Currently there is no consensus about which is the shortest but still suitable questionnaire for Oral Health Related Quality of Life (OHRQoL) assessment indenture wearers. The aim of this study was to test OHIP-EDENT and GOHAI in a sample of denture wearers. Type of denture (complete or partial), age and location (upper or lower jaws) were compared. The results showed that OHIP-EDENT was more sensible than GOHAI, except for Kennedy Class I and II partial dentures. Patients with lower complete dentures had higher OHRQoL impairment using OHIP-EDENT. GOHAI showed underestimated OHRQoL values for individuals over 60 years old.

Keywords: OHIP-EDENT; Denture wearers; Oral health

Introduction

Oral cavity, functional, psychosocial aspects and the person's well-being are considered for oral health definition [1]. The theoretical model of health and patient's self-perception is the base of several questionnaires created to evaluate and to show how much a condition or a treatment affects individual's OHRQoL [2-4]. Rehabilitation of edentulism tends to improve OHRQoL [5,6] but some individuals may still have some impact on it due to misfits, adaptation phase or because individual lack of acceptance of their dentures [7,8]. No consensus exist when edentulous individuals, complete or partial denture wearers are focused in the research [7,9-16]. Literature shows problems with questionnaire's translation, validation, sensitivity and responsiveness [15,17-19]. It also depends on the method of making the questions [20]. An "as short as possible" easy to apply questionnaire should reduce time and costs [2] without losing properties [21]. Therefore, questionnaire's choice is an important issue.

The Geriatric Oral Health Assessment Index (GOHAI) [2] has 12 questions in three subscales: (1) physical function; (2) psychosocial function and (3) pain or discomfort. It is recommended for clinical and epidemiological surveys for assessing oral health with the elderly [22]. Some authors suggest modifications aiming to improve GOHAI's assessment quality [23]. The Oral Health Imp act Profile for Edentulous (OHIP-EDENT) [21] is an OHIP-49's adapted version retaining the most significant questions from each original subscale because this is considered too long for being used in epidemiological studies [23]. OHIP-EDENT's subscales are functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap. It is indicated to use for OHRQoL evaluation with elderly or after replacing missing teeth [24] but some authors claim for missing properties in post-treatment evaluations [21]. The criteria for choosing the questionnaire for partial and complete edentulous patients still remains because literature compares GOHAI and OHIP-EDENT for complete denture (CD) wearers [16] but does not compare OHRQoL of removable partial dentures (RPD) wearers with different Kennedy Classes [25]. Despite the little difference on these questionnaires' size, the advantages of using one or another are not clear. Thus, the aim of this study was to test if GOHAI and OHIP-EDENT would result in comparable OHRQoL outcomes when applied to partial and complete denture wearers, irrespective of age, type of denture or adjustment of the questionnaire.

Methodology

The study was approved by the Local Research and Ethics Committee (protocol 217/2011). The inclusion criterion was that the patient had been rehabilitated with a partial or complete removable denture. A list including all patients with partial or complete denture from one month (for the adaptation period) up to 2.5 years of use [6,17,26] was searched in the Dental School. In this list, 200 patients could be retrieved and contacted by telephone but only 148 individuals were found. Regarding the sample, we have invited all patients that were treated at the University; we invited all for a recall aiming to standardize some bias factors. In addition, a sample size calculation was not possible because it was a retrospective study; all the patients treated during two years were invited to come to the University for a Recall Appointment. Patients were excluded for the following reasons: denture-wearing time higher than three years missed the survey appointment, refusal, being in ongoing prosthodontics treatment and never used or lost the denture. Eighty-two patients were examined, but 8 were excluded because these patients were wearing the prostheses for esthetical purposes, but not to eat. The final sample had 74 individuals, most were women under 60 years old and living in the urban area. Their mean age was 58.6 (± 11.3) years old. Questionnaires were applied in a face-to-face interview and the reference period was the last three months. The answers possibilities were 'never', 'seldom', 'sometimes', 'often', and 'always' and scored as 0, 1,2, 3 or 4, respectively.

To investigate the influence of the type of prosthesis on OHRQoL, the analysis was divided by dental arches and the sample was therefore considered 120, not 74. Reversal was done for the third and fifth questions as well in the answer of the seventh GOHAI question, according to the validated version of GOHAI used in our study. OHIP-EDENT and GOHAI scores had a direct comparison. An adjustment was done attributing different weights to the GOHAI scores, multiplying it by 1.5833 and generating the GOHAI-adjusted group (GOHAI-adj), considering the difference of number of questions between questionnaires. The calculation of weight was done in mathematical basis because as GOHAI has 12 questions and OHIP-EDENT has 19 it is not possible to compare

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scores directly with different number of questions. Dividing 19/17 will result in 1.5833; the value took as the weight.

Each arch was considered for comparison according to the type of denture worn: complete denture (CD); Kennedy Class I-II removable partial denture (RPD I-II); and Kennedy Class III-IV removable partial denture (RPD III-IV).The sample was divided in elderly (above 60 years old) or non-elderly (below or equal to 60 years old). Data collection, measurements and comparisons among questionnaires included Brazilian Portuguese versions. The analysis considered type of denture, dental arch location and age. Statistical analyses were done using SigmaStat3.5 (Dundas Softwares Ltd., Erkrath, Germany) with significance level fixed at 5%. Data from the two questionnaires were analysed using t-test or Mann-Whitney Rank Sum statistical tests (for those that could not be transformed). For questionnaires subscale's comparisons, ANOVA on Ranks were employed.

Results

Seventy nine per cent of the sample used prosthesis for less than one year. For the questionnaires, considering the worst score for question in the whole sample of 74 patients (Table 1), the impairment of OHQoL happened 'never' and 'seldom' with 70.8% of them using the OHIP-EDENT and 77.6% with the GOHAI. Impairment happened 'sometimes' in 12.5% and 12.3% with the OHIP-EDENT and GOHAI respectively. The answers 'often' represented 4% with OHIP-EDENT and 3.1% with the GOHAI. The answers 'always' were 12.7% with OHIP-EDENT and 7% with GOHAI. Average and median scores from the comparison between OHIP-EDENT and GOHAI considering the type of prosthesis are showed in Table 2. Significant differences appeared between OHIP-EDENT and GOHAI scores when raw or adjusted GOHAI values were used. For RPD I–II there were no differences after adjustment.

No differences were found between OHIP-EDENT and GOHAI scores for complete dentures in maxilla (CDmax), (Table 3) even after adjustment. Impairment was significantly higher for CDm and (p=0.010 and 0.038, for OHIP-EDENT and GOHAI, respectively) comparing to CDmax but it did not occur comparing upper vs. lower arch RPD scores. Table 4 shows scores according to the age. Mean

OHIP-EDENT																			
Functionallimitation			**Physical pain**				**Psychological discomfort**		**Physical dis-ability**			**Psychological dis-ability**		**Social disability**			**Handicap**			
Difficult chewing	Food catching	Dentures not fitting	Painful aching	Uncomfortable to eat	Sore spots	Uncomfortable den-tures	Worried	Self-onscious	Avoids eating	Interrupts mealsls	Unable to eat	Upset	Has been embarrassed	Avoids going out	Less tolerant of others	Irritable with others	Unable to enjoy company	Life unsatisfying	PERCENTAGES	
31	16	31	51	39	51	39	46	61	45	58	53	59	68	70	73	71	67	66	70.8	Never and seldom
19	14	15	8	12	10	10	15	9	16	4	11	12	5	3	0	2	6	5	12.5	Sometimes
3	5	8	6	8	4	6	3	0	3	3	4	1	0	0	1	1	0	0	4.0	Often
21	39	20	9	15	9	19	10	4	10	9	6	2	1	1	0	0	1	3	12.7	Always
GOHAI																				
Physical function				Psychosocial function				Pain or discomfort												
Limit social contact	Uncomfortable eating	Trouble speaking	Limit food	Eat without discomfort	Swallow comfortably	Use of medication	Worry/Co ncern	Nervous/Self-concious	Pleased with appearance	Teeth or gums sensitive	Trouble biting, chewing	PERCENTAGES								
57	37	67	51	49	69	60	65	57	60	66	51	77.6	Never and seldom							
9	22	6	13	11	2	2	6	11	7	6	14	12.3	Someti mes							
3	5	1	1	6	1	3	1	1	3	0	3	3.1	Often							
5	10	0	9	8	2	9	2	5	4	2	6	7.0	Always							

Table 1: OHRQoL frequency and percentages for the questionnaires tested.

	OHIP-E	GOHAI	GOHAI-adj	n	p¥
CD	10.8 ± 13.3; 5.5(2.0–12.0)	5.2 ± 8.5; 2.0(0.0–6.0)	8.2 ± 13.4; 3.2(0.0–9.5)	46	0.003 0.045
RPD I-II	15.1 ± 12.6; 13.0(4.0–20.0)	7.3 ± 7.5; 6.0(0.0–11.8)	11.6 ± 11.9; 9.5(0.0–18.4)	43	0.001 0.083 Ω
RPD III-IV	13.8 ± 10.9; 10.0(6.3–18.3)	6.8 ± 7.6; 4.0(0.5–11.6)	10.7 ± 12.1; 6.3(0.8-18.6)	31	<0.001 0.048

Values are average ± SD and median (confidence interval - CI); number of patients (n). ¥p values are the comparison of OHIP-E vs. GOHAI and OHIP-E vs. GOHAI-adj, respectively. Ω not statistically significant differences.

Table 2: OHRQoL values for the questionnaires tested.

	OHIP-E	GOHAI	GOHAI-adj	n	OHIP-E vs GOHAI OHIP-E vs GOHAI-adj¥	Max vs Mand	
						OHIP-E	GOHAI
CD max	8.1 ± 10.16; 4.0(2.0-10)	4.08 ± 7.20; 2.0(0.0-4.5)	6.5 ± 11.4; 3.2(0.0-7.1)	36	0.009 0.071 Ω	0.010 Ω	0.038 Ω
CD mand	20.4 ± 18.8; 10.5(6.0-35.0)	9.2 ± 11.7; 4.5(2.0-13.0)	14.6 ± 18.4; 7.1(3.2-20.6)	10	0.058 0.212 Ω		
RPD I-II max	12.3 ± 12.3; 10.0(2.0-17.0)	6.4 ± 7.9; 4.0(0.00-10.5)	10.2 ± 12.5; 6.3(0.0-16.6)	12	0.181 0.309 Ω	0.420 Ω	0.486 Ω
RPD I-II mand	15,8.3 ± 12.8; 13.5(5.5-21.0)	7.4 ± 7.5; 6.0(1.0-11.5)	11.8 ± 11.8; 9.5(1.6-18.2)	31	0.003 0.141 Ω		
RPD III-IV max	13.7 ± 12.7; 9.0(5.5-16.5)	7.5 ± 8.7; 4.0(1.5-14.0)	11.9 ± 13.8; 6.3(2.4-22.2)	17	0.038 0.214 Ω	0.537 Ω	0.872 Ω
RPD III-IV mand	13.9 ± 8.8; 10.0(7.0-19.0)	5.8 ± 6.2; 4.0(0.0-8.0)	9.3 ± 9.8; 6.3(0.0-12.6)	14	0.006 0.092 Ω		

Values are average ±SD and median (confidence interval - CI); n = number of patients; ¥p values for the comparison between OHIP-E vs. GOHAI and OHIP-E vs. GOHAI-adj, respectively; Ω represents not statistically significant differences α p values are the comparison between maxillary vs. mandibular arches for different questionnaires, respectively.

Table 3: OHRQoL values for both questionnaires according to dental arch.

	OHIP-E	GOHAI	GOHAI-adj	n	p¥
CD ≤ 60	10.8 ± 16.2; 4.0(1.5-10.5)	6.4 ± 10.9; 2.0(0.0-8.0)	10.2 ± 17.2; 3.2(0.0-12.7)	17	0.191 Ω 0.378 Ω
CD > 60	10.7 ± 11.6; 8.0(2.0-12.0)	4.5 ± 6.9; 2.0(0.0-5.3)	7.1 ± 10.9; 3.2(0.0-8.3)	29	0.004 0.045
RPD I-II ≤ 60	13.4 ± 13.1; 8.0(2.5-19.0)	7.5 ± 7.5; 6.0(2.0-11.8)	11.9 ± 11.9; 9.5(3.2-18.6)	19	0.167Ω 0.770 Ω
RPD I-II > 60	16.5 ± 12.2; 14.0(9.0-22.5)	7.2 ± 7.6; 4.0(0.0-11.5)	11.3 ± 12.1; 6.3(0.0-18.2)	24	0.003 0.074Ω
RPD III-IV ≤ 60	16.5 ± 13.5; 11.5(7.0-23.5)	9.4 ± 8.9; 7.0(2.0-17.5)	14.8 ± 14.0; 11.1(3.2-27.7)	16	0.096Ω 0.509Ω
RPD III-IV > 60	10.9 ± 6.6; 10.0(6.3-15.8)	4.0 ± 4.9; 4.0(0.0-4.0)	6.3 ± 7.8; 6.3(0.0-6.3)	15	0.002 0.020

Values are average ± SD and median (confidence interval - CI); number of patients (n). ¥p values are the comparison between OHIP-E vs. OHAI and OHIP-E_{vs} GOHAI-$_{adj}$, respectively. Ω represents not statistically significant differences

Table 4: OHRQoL values according for both questionnaires to age.

	CD	RPD I-II	RPD III-IV
OHIP-EDENT			
Functional limitation	3.4 ± 3.3; 2.0(0.0-6.0)	3.6 ± 0.5; 6.0(2.3-8.0)	5.7 ± 2.5; 6.0(4.0-8.0) Ω
Physical pain	3.1 ± 4.9; 0.0(0.0-4.0)	4.7 ± 4.9; 4.0(0.0-8.0)	3.5 ± 3.4; 3.0(0.0-5.0)
Psychological discomfort	1.3 ± 1.9; 0.0(0.0-2.0)	1.5 ± 2.4; 0.0(0.0-2.0)	1.3 ± 1.6; 0.0(0.0-2.0)
Physical disability	2.0 ± 3.5; 0.0(0.0-2.0)	2.2 ± 3.2; 0.0(0.0-3.8)	1.9 ± 2.9; 0.0(0.0-2.0)
Psychological disability	0.3 ± 0.8; 0.0(0.0-0.0)	0.6 ± 1.2; 0.0(0.0-0.0)	0.7 ± 1.6; 0.0(0.0-0.0)
Social disability	0.2 ± 1.0; 0.0(0.0-0.0)	0.1 ± 0.4; 0.0(0.0-0.0)	0.2 ± 0.8; 0.0(0.0-0.0)
Handicap	0.4 ± 1.4; 0.0(0.0-0.0)	0.3 ± 0.9; 0.0(0.0-0.0)	0.5 ± 1.4; 0.0(0.0-0.0)
GOHAI			
Physical function	2.2 ± 3.5; 0.0(0.0-2.0)	3.3(± 3.6); 2.0(0.0-6.0)	2.0 ± 2.7; 2.0(0.0-2.0)
Psychosocial function	1.9 ± 3.6; 0.0(0.0-3.0)	2.6(± 3.1); 2.0(0.0-4.8)	2.9 ± 3.4; 2.0(0.0-5.5)
Pain or discomfort	1.1 ± 2.2; 0.0(0.0-2.0)	1.4(± 1.9); 0.0(0.0-2.0)	1.9 ± 3.4; 0.0(0.0-2.0)
GOHAI-adj			
Physical function	3.5 ± 5.6; 0.0(0.0-3.2)	5.2 ± 5.8; 3.2(0.0-9.5)	3.0 ± 4.3; 0.0(0.0-3.2)
Psychosocial function	3.0 ± 5.7; 0.0(0.0-4.8)	4.2 ± 4.9; 3.2(0.0-7.5)	4.5 ± 5.4; 3.2(0.0-8.7)
Pain or discomfort	5.8 ± 10.6; 0.0(0.0-8.2)	2.3 ± 2.9; 0.0(0.0-3.2)	3.1 ± 5.5; 0.0(0.0-3.2)

Values are average ± SD and median (confidence interval - CI); ANOVA on RANKS comparison among different prostheses by subscale for OHIP-E and GOHAI; Ω represents statistically significant differences among CD and the other types of RPD.

Table 5: Subscale values according to different questionnaires.

values were 61.2 for CD; 60.4 for RPD I-II and 53.8 for RPD III-IV. For non-elderly no differences between raw or adjusted scores were found. For the elderly, there were differences between OHIP-EDENT and GOHAI for all types of prosthesis. After the adjustment, differences appeared between CD and RPD III-V (p=0.020). Descriptive values for subscales are shown in Table 5. Functional limitation showed difference in different kinds of prosthesis. Differences occurred between RPD I-II and RPD III-IV groups, with mean values of 3.6 ± 0.5 and 5.7 ± 2.5, respectively (p<0.001). Food catching (Table 6) was the only item to show differences for the different prostheses, with RPD I-II and RPD III-IV different from CD (p<0.001).

	CD	RPD I-II	RPD III-IV
Difficulty chewing	0.0(0.0-2.0)	2.0(0.0-4.0)	0.0(0.0-2.0)
Food catching	0.0(0.0-2.0)	4.0(2.0-4.0)	4.0(2.0-4.0) Ω
Dentures not fitting	0.0(0.0-3.0)	0.0(0.0-3.0)	0.0(0.0-4.0)

Values are median and confidence interval (ANOVA on Ranks among different prostheses); Ω represents statistically significant differences among CD and the other types of RPD.

Table 6: Comparison for functional limitation on OHIP-EDENT subscale items.

Discussion

Our study methodology corroborates with the statement that OHIP-EDENT does not cause the called 'floor effect', which is a tendency of the GOHAI or other short questionnaires [21]. The difference in percentage for the OHIP-EDENT in the frequency of 'never/almost never' comparing to the GOHAI was almost the same difference in the frequency of the answers 'always' between these questionnaires, thus there were differences in frequency and a tendency of 'floor effect' for GOHAI. The analysis considered the location of the denture mainly because almost all patients replied back with "Which denture are you talking about, the upper or the lower? thus, patients had different answers for each one of his/her arch. Patients frequently reported that in maxilla everything was all right but the problem for eating, for example, was due to the lower prosthesis. The difficulty in wearing for eating or even because of food retention impacted the OHRQoL occurred in many individuals of the sample. The analysis considering one arch was also performed, but the differences did not appear among the questionnaires; when considering both separately, these differences were remarkable.

Different original or modified questionnaires may be used in the same study for OHRQoL assessment [16,19,23,27,28]. OHIP-EDENT and GOHAI have quite similar domains but they are not equal [27]. The balance of the weight of each domain in GOHAI could be a feasible solution for comparison. Our study was the first to adjust weights to compare OHIP-EDENT and GOHAI scores. Statistical analysis did not show differences comparing the OHIP-EDENT and GOHAI-adj values considering the worst answer with 74 individuals. Most studies usually use the worst score but did not discriminate denture location but patients often answer questionnaires saying that only one of the dentures was causing impact. Moreover, different arch's location can present different retention, stability, acceptance and adaptation degrees.

Literature shows similar impairment levels comparing OHRQoL with CD and RPD wearers [29] but other studies show the opposite [11,16]. Our results presented differences between CD and RPD I-II. We suppose that the RPD I-II group showed different response levels because functional limitation is well assessed with the GOHAI' [19,27]. Comparison between maxillary vs. mandibular arches was made. Raw data from OHIP-EDENT vs. GOHAI showed that the groups CDmax, RPD I-IIm and, RPD III-IV max and RPD III-IVm and did not present significant differences after adjustments. Impairment in the lower arch was higher than in the upper arch solely for CD wearers, irrespective of the questionnaire used. Mandibular stability and retention of conventional CD were often worse than in the maxilla [6], corroborating our findings. Data in literature assessing different location of CD and RPD are scarce or lacking. Irrespective on the type of denture tested, in individuals below 60 years old, impairment differences were not present. For the elderly patients, except in the RPD I-II group, the differences between OHIP-EDENT and GOHAI and OHIP-EDENT vs. GOHAI-adj found in our study corroborated with a study that showed that GOHAI scores tends to decrease as age increases [16].

Functional limitation was the only subscale to show differences among all groups. Discriminating the subscale items "difficulty of chewing" and "fitting" of RPD was not impacting but "food catching" was the most impacting item that differs RPD from CD wearers, which is in agreement with another study [29]. Data from OHIP-EDENT and GOHAI could be different when assessing OHRQoL in elderly populations, as our analysis has shown. Moreover, the level of impairment in the lower arch, in our sample, was higher than in the upper arch for complete denture wearers irrespective of the questionnaire used. One limitation of our study was the fact that we have had very few male patients over 60 years old or patients who lived in the countryside. Conclusions cannot be drawn for this specific population, while they remain to be studied.

Conclusion

OHRQoL assessment with GOHAI and OHIP-EDENT were similar. Little differences occurred between the different domains, as functional domains produced different impairment in complete denture wearers in our study. GOHAI should be used with caution when assessing elderly individuals, as it resulted in a tendency of 'floor effect' for the OHRQoL results, while OHIP-EDENT did not.

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