BRIEF COMMUNICATIONS

Linguistic Adaptation and Validation of the General Oral Health Assessment Index (GOHAI) in an Elderly Japanese Population

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Abstract

Objectives: *This study sought to develop a Japanese version of the General Oral Health Assessment Index (GOHAI) and validate its use in an elderly Japanese population.* ***Methods:*** *The GOHAI scale was translated in a standardized way consisting of forward translation, pilot study, and backward translation. Psychometric properties of the final version were assessed on 175 participants (mean age: 70.0 years, SD 6.4).* ***Results:*** *The response rate was more than 98% for each item. The reliability in terms of a Cronbach's alpha value was 0.89. The mean GOHAI scores were significantly lower for participants with poor perceived oral health (P<0.001) or poor perceived general health (P<0.01). Significant correlations were observed between the GOHAI scores and the general health or physical functioning scores of the Medical Outcome Study Short Form 36 (P<0.01).* ***Conclusions:*** *The present study showed that the Japanese version of the GOHAI was psychometrically valid in an elderly sample population.*

Keywords: QOL, elderly, oral health, GOHAI, validation study, Japanese

Introduction

The association between oral diseases and health-related quality of life (HQOL) in older adults warrants special attention. According to a national survey conducted by the Japanese Ministry of Health, Labour, and Welfare (1), the average number of missing teeth per Japanese adult aged 70–74 years exceeds 15, i.e., approximately half of all teeth. Given that Japanese life expectancy is among the highest in the world, the assessment of HQOL in individuals with oral diseases is increasingly important for promoting an equitable distribution of limited medical resources.

The General (Geriatric) Oral Health Assessment Index (GOHAI) is a well-known oral health-related QOL (OHQOL) instrument that was originally developed for use among the elderly (2). Versions have been developed in several languages (3,4) and widely used in a variety of adult sample groups of all ages (5). The GOHAI contains only 12 questions. Each question has a score between one and five, and the cumulative score from the 12 questions represents the GOHAI score (a maximum of 60 and a minimum of 12). This study aimed to develop a Japanese version of the GOHAI and validate its use in an elderly Japanese population.

Methods

Translation and pilot study. After permission to produce a Japanese version had been obtained from the original author, the GOHAI was translated into Japanese using the following internationally established method (6). Two translators, both native speakers of Japanese who were bilingual in Japanese and English, worked independently to produce two initial Japanese versions of the GOHAI. The two translators compared their translations of the question items and together with the investigators produced a single, reconciled version.

Once the initial forward translation had been finished, the authors conducted a pilot study of local residents in the Kansai area to test the reconciled version (7). Based on the results, the questionnaire was re-evaluated. In the original version of the GOHAI, there were three positively worded questions and nine negatively worded questions. The authors found that participants were able to answer the positively worded questions more easily and more correctly when the questions were reworded in the negative. Finally, the GOHAI was changed to include only negatively worded questions.

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A back translation was produced and then confirmed by the original author. With her final permission, the Japanese version 1.0 of the GOHAI was completed.

The validation study. Socially active persons aged 60 years or more were recruited at a social center in Hirakata City, an urbanized area in the eastern Osaka district. The inclusion criteria were that all participants could complete the self-administered questionnaire and provide informed consent. After the participants completed the GOHAI questionnaire, some were then randomly selected to undergo a clinical examination to assess their dental and periodontal condition. The study was approved by an institutional review board at Kyoto University.

The internal consistency of the GOHAI was assessed using Cronbach's alpha. Item-scale correlation coefficients were used to assess the correlation between the individual items and the GOHAI score. A factor analysis was performed to explore the factor structure of the GOHAI.

To test the concurrent validity of the GOHAI, associations between the GOHAI scores and subjective or objective measures, such as a single-item, self-rated oral health score, or the general health (GH) and physical functioning (PF) domains of the Medical Outcome Study Short Form 36 (SF-36) (8) were examined.

Table 1
Concurrent validity of GOHAI scores and certain groups of questions

Variables	Number of participants	Mean GOHAI score (standard deviation)	Test
Self-rating of oral health			
Very good, excellent	14	57.9 (2.7)	Kruskal-Wallis
Good	76	54.3 (4.6)	P <0.01
Fair, poor	62	49.1 (7.3)	
Poor, very poor	19	38.7 (10.0)	
Self-rating of health			
Very good, excellent	24	53.4 (4.9)	Kruskal-Wallis
Good	96	52.6 (6.9)	P <0.001
Fair, poor	47	47.1 (9.5)	
Poor, very poor	6	45.7 (13.4)	
Perception of dental care needs			
Yes: on receiving the care at present	19	46.2 (12.0)	Kruskal-Wallis
Yes: not having the care	82	48.8 (8.3)	P <0.001
No	70	54.5 (4.9)	
Education			
Junior high school	39	46.6 (9.1)	Kruskal-Wallis
high school	109	51.9 (8.1)	P <0.005
Tertiary, College	27	53.1 (5.7)	

Table 2
Discriminant validity of GOHAI-based on certain objective measures of oral health

Variables	Number of participants	Mean GOHAI score (standard deviation)	Test
Number of teeth			
edentulous	3	38.7 (18.5)	Kruskal-Wallis
1-19	42	46.3 (9.7)	P <0.001
20 teeth and more	88	54.0 (5.8)	
CPI			
0-2	64	52.1 (8.9)	Kruskal-Wallis
3	49	51.8 (7.0)	n.s.
4	11	48.9 (8.8)	
Removable prosthesis			
Yes	57	47.0 (5.5)	Mann-Whitney
No	76	54.5 (10.0)	P <0.001

Results

The development of the GOHAI began in October 2002, following a standard translation protocol. The validation study for Japanese version 1.0 was conducted in February 2004.

A total of 175 elderly persons with a mean age of 70.0 years (SD=6.4, range: 60–84) participated in the validation study. Seventy-eight percent of the respondents had a high school education or greater. Sixty-eight percent were female, and 10% were employed; 133 were randomly selected for clinical examinations.

The percentage of missing responses for each item was calculated to identify percentages of 10% or higher. Percentages of missing data ranged from 0% to 1.7%; there were no missing data for 3 of the 12 items. Only 2 of the 175 participants did not respond to two or more items.

The response rate was more than 98% for each item. According to the factor analysis, the scale was unidimensional, which could explain 47% of the total variance. Cronbach's alpha was computed to assess internal-consistency reliability; for all 12 items, the alpha value was 0.89. Item-scale correlations varied between 0.48 and 0.77. Those in the questions regarding sensitivities, swallowing, using medication, appearance, and speaking were 0.48, 0.56, 0.60, 0.62, and 0.67, respectively. Other item-scale correlations were more than 0.7.

The mean GOHAI scores were significantly lower for participants with poor perceived oral health or poor perceived general health (P<0.01; Table 1). Those who felt that they needed dental treatment had a lower mean GOHAI score than those who did not perceive a need for treatment (P<0.001). Respondents with a low level of education had significantly lower GOHAI scores as compared to well-educated respondents (P<0.05). Participants with a high number of remaining teeth or who did not wear

removable prostheses had a higher mean GOHAI score (P<0.001; Table 2). Although participants with a higher Community Periodontal Index (CPI) score had a lower mean GOHAI score, the difference was not statistically significant.

The mean General Health (GH) and Physical Functioning (PF) scores of the SF-36 were 50.1 (SD=8.0) and 54.6 (SD=8.0), respectively. If the score in a domain of the SF-36 was higher than 50 for the norm, it represented a better health status than the average person in the Japanese population (8). There were significant correlations between GOHAI scores and GH or PF scores (r=0.236 and r=0.296, respectively; P<0.01).

Discussion

This study developed a Japanese version of the GOHAI and validated the translated instrument for an elderly population. One characteristic of the Japanese version is the use of only negatively worded questions. While the response acquiescence bias could have occurred due to the one-way worded questions (9), the correlation coefficient between the GOHAI scores and single items rating oral health status was similar in both the Japanese and other language versions (2–4). As in the French and Chinese versions, significant associations were found between the mean GOHAI score and the number of remaining teeth, the self-rating of general health status, education, and perception of dental care. The results all suggested that the validity of the Japanese GOHAI was comparable to those of other language versions.

The participants had on average completed more education than the general Japanese population (10). In regard to the participants' oral health, the mean of their missing teeth was less than the general Japanese population, even though the proportion of CPI scores of 3 or 4 was similar (1). Previous studies have shown that factors of socioeconomic status, such as income, employment, and education, influence the GOHAI score (4). Considering the mean scores of the SF-36, the participants in this study had maintained better than average mental and physical health. The study population had better oral health, mental and physical health, and possibly a higher oral health-related QOL. Further research is needed using both the GOHAI and the HQOL instruments in different settings to evaluate the tools more fully. The stability of the GOHAI over time through the test–retest procedure also needs to be examined.

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Previous Presentation

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