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Research paper

# Oral health related quality of life in older people: Preliminary validation of the Greek version of the Geriatric Oral Health Assessment Index (GOHAI)

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ABSTRACT

*Introduction:* The Geriatric Oral Health Assessment Index (GOHAI) has been developed for the patient-reported assessment of oral health problems in older people. The aims of the present study were to translate the GOHAI into the Greek language, adapt the Greek version culturally, and perform a preliminary validation in an older Greek population.
*Materials and methods:* GOHAI was translated from English into Greek by two bilingual translators and then back translated. The translated version was interviewer-administered in a sample of 100 older people. Internal consistency reliability and principal component analysis with Varimax rotation was performed. Concurrent and discriminant validity and test-retest reliability were assessed. Descriptive statistics and analysis between variables were also performed.
*Results:* GOHAI showed satisfying internal consistency (Cronbach's $\alpha$: 0.88), while the Exploratory Factor Analysis revealed three factors requiring further investigation. The scale showed satisfying concurrent validity with significant correlations with the general single-item questions. Discriminant validity was acceptable identifying differences in relation to medical conditions and medications used.
*Conclusions:* The acceptable internal consistency and validity of the Greek version of the GOHAI recorded in the present study encourages its use in older people. The present translation of the GOHAI merits further validation in a larger cohort as well as in a geriatric context.


## 1. Introduction

With the increasing numbers of older people worldwide, inventories that could describe their oral health status, be valid, comprehensive, practical, easy to administer even by non-dental health care professionals and identifying a need for dental referral, are becoming very important.

A number of oral health status indicators, based on patient-assessment, have been developed in the past years and used in geriatric dentistry, such as the Geriatric Oral Health Assessment Index (GOHAI) [1,2], the Dental Impact on Daily Living (DIDL) [3], the Subjective Oral Health Status Indicators (SOSHI) [4], and the Oral Health Impact Profile (OHIP) [5].

The GOHAI was specifically developed for the self-assessment of oral status in older people [1] and is one of the most commonly applied instruments in geriatric dentistry worldwide. As it emphasizes more on functional problems, pain and discomfort, it can identify more easily oral problems in older people compared to other related inventories, like the OHIP-14, that places more emphasis on psychosocial aspects [6]. The GOHAI has been translated and validated in various languages and cultures such as in German [7], Swedish [8], French [9], Malay [10], Mandarin-Chinese [11], Turkish [12], Japanese [13], Mexican [14], and Arabic [15], and has been shown to be an effective and reliable means to assess oral health-related quality of life among older people. As the GOHAI was later shown to have acceptable reliability and validity also in other age groups, it was suggested to be renamed as the

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General Oral Health Assessment Index [2]. The GOHAI is useful both at a patient level, either living in their own homes or in nursing homes, and at a community level [1]. At a patient level, it may indicate when further oral examination or a dental referral is necessary, and can be easily applied by dental and other primary health care providers [1]. At a community level, GOHAI may serve gathering information about the oral health status or the treatment outcome in older people [1]. As the GOHAI is based on self-assessment, it cannot be used in patients with cognitive impairment. Furthermore, any inability to read and fill the questionnaire due to literacy problems [2] or vision impairment demands that the questionnaire would be interviewer-administered.

GOHAI is a 12-item questionnaire containing both positive and negative items. Its items were selected based on three theoretical dimensions:

- physical function which includes eating, chewing, speaking and swallowing (four items);
- psychosocial function which includes worry or concern about oral health, dissatisfaction with appearance, self-consciousness about oral health, avoidance of social contacts because of oral problems or eating in front of other people (five items) and;
- pain and/or discomfort, including discomfort when eating, tooth and gums sensitivity, and use of medications to relieve pain or oral discomfort (three items) [1].

The original version of the GOHAI consisted of six response options for each item, namely 'Always', 'Very Often', 'Often', 'Sometimes', 'Seldom' and 'Never' [1]. There are nine negative items scoring reversed and the final scores range from 0 to 60, with higher scores indicating better oral health [1]. The total GOHAI score is assessed by adding the 12 final item scores.

As older people in Greece often refrain from routine dental care due to various socioeconomic reasons, the role of primary health care professionals (i.e. physicians, nurses, physiotherapists) in identifying older people with oral problems needing dental referral is crucial. Therefore, the application of easy to use and assess instruments, such as the GOHAI, would be important at a patient and a community level.

The aims of the present study were to translate the GOHAI into the Greek language, adapt the Greek version culturally, and perform a preliminary validation of the Greek version in an older Greek population.

## 2. Materials and methods

### 2.1. Translation of the index

The GOHAI was translated from English into Greek by two bilingual translators. This first Greek version was pilot tested on a convenience sample of 10 older people to diagnose any unclear questions. Minor modifications of the Greek text were performed in items 4, 5 and 10. The questionnaire was then back translated from Greek into English by two bilinguals who verified that the meaning of the questions was maintained.

### 2.2. Study population – data collection

A sample of older community-dwelling people aged 60 years and over was recruited from the Open Care Community Centers for Older People in the metropolitan Athens area. These Centers are supported by the Municipal Authorities and welcome all independent community-dwelling older people living in the area, offering various social, cultural and health activities on a daily basis.

One trained examiner conducted a face-to face interview using a structured questionnaire after explaining the purpose of the study and obtaining informed consent. The questionnaire included items on sociodemographic history (age, gender, marital status, and educational level), medical history (based on the ICD-10 Classification of Diseases and Related Health Problems) and medication use (based on the classification of the National Organization for Medicines). General single-item questions were asked about self-perceived general health, self-perceived oral health, and self-perceived oral healthcare needs. The responses were given on a five-point Likert scale. Furthermore, the presence of natural teeth (yes, no) and removable dentures (complete or partial, maxillary or mandibular) was recorded. Subsequently, the Greek version of the GOHAI was administered. The GOHAI items were provided on a six-point Likert scale and the scoring was performed according to Atchison and Dolan [1] after reverse coding of the negatively phrased questions.

The study was approved by the Athens Dental School Committee for Research Ethics (Research Protocol #225/2014).

### 2.3. Validation procedure

The analysis included:

- principal component analysis with an orthogonal (Varimax) rotation to assess the internal structure of the measure. Before performing the factor analysis, the assumptions about the normality of the distribution were investigated. Skewness and kurtosis were used as normality indicators among single variables [16,17]. Questions whose deletion increased the overall $\alpha$ and those loading $< 0.40$ or loading on more than one factors or were unexpectedly grouped in another factor were thoroughly examined;
- internal consistency reliability, using Cronbach's $\alpha$ coefficient and corrected item-total correlations to decide which low-contributing items should be removed from the scale. The observed scale $\alpha$ should be 0.70 to be acceptable, 0.80 to be good and 0.90 to be excellent [18];
- concurrent validity, by examining the correlations between the measure and its individual items, and the single-item content-related questions (self-perceived general health, self-perceived oral health, self-perceived oral healthcare needs);
- discriminant validity, by investigating differences between groups in relation to gender, age, marital status, education, edentulousness, use of removable dentures, general medical conditions and medications' use.

Even though both the exploratory factor analysis (EFA) and the confirmatory factor analysis (CFA) are based on the common factor model, and both seek to represent the structure of correlations among measured variables using a relatively small set of latent variables, EFA provides procedures for determining an appropriate number of factors and the pattern of factor loadings primarily from the data. As the theoretical basis for calculating a specific model for the GOHAI is not very strong and the researcher may fail to identify possible factors, an EFA data-driven approach seemed preferable. Furthermore, separated EFA models were also applied, based on the proposed theoretical subscales published in the literature:

- physical function (items: 1, 2, 3, 4);
- pain or discomfort (items: 5, 8, 12) and;
- psychosocial function (items: 6, 7, 9, 10, 11).

To evaluate the principal component analysis, clusters of items were observed and interpreted. Criteria for retaining extracted component(s) included the following: