

Development of the Turkish version of the oral health assessment tool: Methodological study

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Abstract

Aim: This research aimed to assess the validity and reliability of the “Oral Health Assessment Tool for the Elderly” Turkish form.

Methods: A total of 262 elderly individuals > 65 years of age were included in the study. These individuals were selected from community-dwelling elderly and nursing home residents in the Konya province of Turkey. A data form containing sociodemographic information and oral health behavior was used to collect the data. In addition, the Geriatric Oral Health Assessment Index and the Oral Health Assessment Tool for the Elderly were used. To create the Turkish version of the tool, the form was translated and back-translated for content validity. Expert opinion was obtained for criterion validity. Last, confirmatory factor analysis and exploratory factor analysis were performed to evaluate construct validity. Test-retest reliability, interobserver reliability, and Cronbach’s alpha reliability coefficients were calculated.

Results: The Tool Turkish form consisted of 10 items and two factors. The Cronbach’s alpha reliability coefficient was 0.86. The total variance explained by the items was 60.19%, and the test-retest reliability coefficient was 0.95. The content validity index was 0.90, and Kendall’s coefficient of concordance was 0.97. The correlation coefficient between the scales is 0.719. The mean Oral Health Assessment Tool for the Elderly score obtained by the participants was 5.4 ± 4.32 (median 5, min-max: 0–17).

Conclusion: The Turkish version of the tool is a valid and reliable tool to assess oral health in community-dwelling elderly individuals and those living in nursing homes.

KEYWORDS

elderly, OHATE, oral health, reliability, validity, nursing

1 | INTRODUCTION

Changes occur in the body with aging. Oral health is also affected by aging.¹ The World Health Organization (WHO) defines oral and dental health as “the absence of

chronic mouth and facial pain, mouth and throat cancer, mouth sores, congenital defects such as cleft lip and palate, gum diseases, gingival recession and tooth loss, and other diseases or disorders affecting the oral cavity”.^{2–4} The functional dimensions of oral and dental health are

chewing, biting, swallowing, and speaking. The psychological dimensions are appearance and self-confidence, and the social dimensions are sex/intimacy, communication, and social relations. Acute or chronic pain and restlessness can also be added to this list.^{4,5} Oral and dental health problems can affect individuals differently and aggravate aging owing to accompanying physiological changes in the body.

Oral mucosa and connective tissue in the mouth serve as a defensive barrier to protect general health. Epithelial mucosal cells also synthesize substances such as keratin and laminin. These substances are critical for the protection of the oral mucosal surface.^{1,6,7} With aging, the oral mucosa becomes thinner, the papillary structure on the tongue surface deteriorates, and the tongue becomes softer. In the dental tissue, the many transfer lines seen naturally on the teeth slowly disappear and the enamel layer becomes smoother as a result of aging. Dulling and discoloration ensue.^{8,9}

Oral diseases are one of the most common diseases worldwide and pose healthcare, economic, and social burdens.¹⁰ According to the Global Disease Burden 2017 initiative, approximately 3.5 billion people are affected by oral diseases worldwide, and the most frequent oral problem is untreated tooth decay in permanent teeth.¹¹ Oral and dental health is a part of the overall health and its deterioration significantly affects the overall health status and quality of life of individuals.^{12,13} Major non-communicable diseases affecting oral health include cardiovascular disease, cancer, chronic respiratory disease, and diabetes. Tobacco use, alcohol consumption, sugar consumption, and an unhealthy diet can be listed among the modifiable risk factors that affect oral health and lead to oral and dental diseases. Problems that occur in oral and dental health negatively affect nutrition and threaten the overall health of individuals.^{6,7,14} These problems are perceived as a normal consequence of aging and are often neglected by elderly individuals. Ensuring that elderly individuals attach due importance to these problems and evaluating the oral health of elderly individuals in cooperation with nurses can help minimize the adverse effects.^{14,15}

WHO states that oral healthcare systems are an indispensable part of primary healthcare services and that they should be strengthened in a manner that does not pose a financial burden on the individuals.⁴ Public health nurses play a critical role in preventive healthcare services and are effective in determining how these services are received. Hence, they are excellent candidates to take on this responsibility. According to dentists, there are more nurses per patient, nurses are more accessible, and they can spend more time with the patients in Turkey.¹⁶

In the literature, there is a need for tools to be used by nurses for evaluating oral and dental health in the elderly,

which can be included as a part of the comprehensive patient evaluation process.¹⁵ In Turkey, the Geriatric Oral Health Assessment Index (GOHAI) is available to assess oral health.¹⁷ This tool was developed and adapted based on self-report and was validated in the Turkish language. Oral Health Assessment Tool for the Elderly (OHATE), on the other hand, evaluates oral health more objectively as a result of the nurse's observation.¹⁸ In this context, it is valuable to adapt it on behalf of our country and to use it in the field (Figure 1). Accordingly, this research aimed to assess the validity and reliability of the OHATE Turkish form in the geriatric population in Turkey.¹⁸

The research questions were as follows:

- ✓ Is OHATE a valid and reliable tool?
- ✓ What is the mean OHATE score among elderly individuals included in this research?
- ✓ Is there a correlation between the OHATE and GOHAI scores?

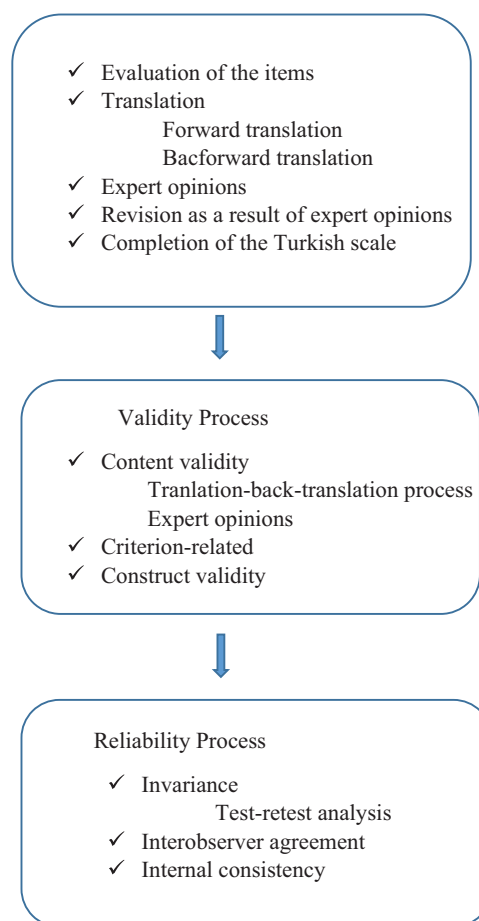


FIGURE 1 Scale adaptation processes [Color figure can be viewed at wileyonlinelibrary.com]

2 | METHODS

2.1 | Preliminary considerations

This study was designed as a methodological research. The COSMIN checklist reports on a study of measurement features.¹⁹ For this reason, the COSMIN checklist was used to report this research. The research was conducted at Nursing Home Elderly Care Rehabilitation Center and in FHCs with the largest patient pool in central districts of Konya. The research population consisted of individuals aged ≥ 65 years living in the province in Konya. There are many approaches for sample selection in methodological studies. Some studies argue that a sample size of 10 times the number of items in the data collection tool is sufficient.²⁰ While adapting the scale, a sample size of 100–200 subjects for the whole scale or 5–10 subjects for each item is recommended to ensure that the factor analysis is valid.²¹ Research data were collected from a total of 262 individuals. The data of 130 individuals were used for exploratory factor analysis (EFA), and data of 132 individuals were used for confirmatory factor analysis (CFA). In the present research, all elderly volunteers who applied to a Family Health Center (FHC) in Konya between May and September and those who met the nursing home inclusion criteria were included in the study.

Inclusion Criteria:

- ✓ Being ≥ 65 years of age
- ✓ Not having any communication problems
- ✓ Not being bedridden
- ✓ Good mental and psychological health
- ✓ Having at least two teeth in occlusion

Data Collection Tools: The forms used to collect data were prepared by the researchers in accordance with the relevant literature.^{8,14,15,18,22} The data were collected via face-to-face interviews with the participants that included an oral examination. The participants were given information about the research prior to data collection. The data were collected by a clinician nurse and the academician nurse. Tongue depressor and light source were used for oral examination.

Standardization in the Application of Data Collection Tools: To ensure standardization among the interviewers when applying the data collection tools, the interviewers were given 2 hours of training by the responsible researchers before data collection.

1. *Personal Information Form:* This form consists of questions, including some sociodemographic characteristics of elderly individuals and their oral health behaviors.

2. *Geriatric Oral Health Assessment Index (GOHAI):* GOHAI consists of 12 items and three subdimensions. It evaluates physical functions, psychosocial functions, and pain or discomfort related to oral health. Each item is scored in a five-point Likert-type measure (always = 0, very often = 1, often = 2, sometimes = 3, very rarely = 4, never = 5). Items 3, 5, and 7 are scored in reverse. The minimum score that can be obtained from the scale is 12, and the maximum score is 60. A score of < 50 is classified as poor oral health, a score of 51–56 as moderate oral health, and a score of 57–60 as good oral health. The Turkish validity and reliability of the scale was made by Ergül and Akar.¹⁷
3. *Oral Health Assessment Tool for the Elderly (OHATE):* The OHATE was developed by Kayser-Jones et al. The tool contains 10 items questioning oral health and functional status.¹⁸ Each item contains three descriptors and is scored between 0 and 2. For each item on the scale, “0” points indicate good and “2” points indicate poor oral health. The total score is calculated from the sum of the item scores. The minimum score that can be obtained from the scale is 0, and maximum score is 20. Higher scores indicate poor oral health.¹⁸

2.2 | Translation process

Translation–back-translation Process: The Turkish raw translation of the scale was performed by three experts in the field of nursing and three experts fluent in English. Back-translation was then done using the Turkish text by an independent native English speaker. The back-translation was sent to the original author of the scale, Kayser-Jones et al.¹⁸ The author confirmed that the back-translation retained the content validity.

Expert Opinions: The scale was sent to 23 nurse academicians, dentists, and physicians to get expert opinions. All the chosen experts were working in the field of elderly care and oral health. Out of the 23 experts, nine responded with their opinions. In addition, the Turkish version of the scale was evaluated by an expert Turkish linguist.

2.3 | Validation process

2.3.1 | Validity process

Criterion-related/Concurrent Validity: In the present research, the participants were evaluated with GOHAI together with OHATE, and the correlation between the tools was calculated

Construct Validity: Confirmatory and exploratory factor analyses were performed to assess construct validity. In adaptation studies, the construct validity of the scale should be checked with confirmatory factor analysis studies. It should be verified how many dimensions the adapted scale is and what the dimensions are. The structure found by explanatory factor analysis is tried to be confirmed by confirmatory factor analysis. While induction is made in exploratory factor analysis, there is deduction in confirmatory factor analysis. The structure revealed in confirmatory factor analysis is tested. Since, the items were grouped under two factors, they were detailed in the table (Tables 3 and 4).

2.3.2 | Reliability process

Invariance: The intermittent method was chosen for the test-retest analysis. The retest was applied to 40 individuals at least 2 weeks after the initial test.

Interobserver Agreement: Two interviewers applied OHATE on 40 elderly individuals independently of each other.

Internal Consistency: For internal consistency, Cr α reliability coefficient and item-total score reliability were evaluated.

Ethical Considerations: Ethical approval was obtained from the ethics committee of Necmettin Erbakan University (2020/2593) prior to data collection. Furthermore, the necessary written permissions were obtained from the institutions where the research was to be conducted. Permission to use OHATE and GOHAI was obtained from the relevant authors via email. Last, consent was obtained from all participants.

Statistical Analysis: Kaiser–Meyer Olkin (KMO) value was initially checked to determine the suitability of the data for principal component analysis. Bartlett's test of Sphericity was then conducted to test whether the correlation matrix was equal to the unit matrix. EFA was performed to check construct validity. Cr α coefficient was calculated to check internal consistency. Test-retest reliability was estimated to determine the consistency of the developed tool despite changing conditions. Item–test correlations were derived to check item validity. Kendall's coefficient of concordance was computed to evaluate the interobserver agreement. The content validity index (CVI) was gauged to analyze expert opinions. CFA was done to ensure that the scale would exhibit the same factor structure among similar samples. Last, correlation analysis was performed between the OHATE and GOHAI scores. IBM SPSS Statistics 22 and LISREL 8.80 package programs were used in the study. $p < .05$ was accepted as statistically significant in all analyses.

TABLE 1 Participants' socio-demographic characteristics

Characteristic	Frequency (n)	Percentage (%)
Residence		
Nursing home	94	35.9
Community-dwelling	168	64.1
Sex		
Female	171	65.3
Male	91	34.7
Marital status		
Married	147	56.1
Single	115	43.9
Education status		
Illiterate	15	5.7
Literate	106	40.5
Primary school/Secondary school	78	29.8
High school/University	63	24.0
Smoking		
Yes	59	22.5
No	203	77.5
Chronic disease		
Yes	207	79.0
No	55	21.0
Continuous drug use		
Yes	209	79.8
No	53	20.2

3 | RESULTS

3.1 | Sample characteristics

It was found that 64.1% of the participants included in the present research were community-dwelling elderly individuals. Furthermore, 65.3% were women, 40.5% were literate, and 79% had a chronic disease (Table 1). Additionally, 37.4% of the participants stated that they did not receive any previous information about oral and dental health, and 48.9% of the participants evaluated their oral health as "good." However, it was found that 89.7% of the participants went to dental check-up only when they had a problem with their teeth, 44.7% brushed their teeth once a day, and 51.5% had been using dentures for 6–10 years (Table 2). The mean age of the participants was 72.15 ± 6.93 years, the mean daily water intake was 1.24 ± 0.54 L, and the mean number of teeth was 13.12 ± 4.97 . The mean GOHAI score obtained by the participants was 40.39 ± 15.88 (median 46.0, min-max: 5–59), while the mean OHATE score was 5.4 ± 4.32 (median 5, min-max: 0–17).

TABLE 2 Participants' findings on oral health behaviors

Oral health behaviors	Frequency (n)	Percentage (%)
Previous information about oral and dental health, if any, and source of information		
No previous information	98	37.4
Have previous information	164	62.6
From healthcare personnel	96	58.5
Relatives/neighbors/social	68	41.5
General lifestyle		
Healthy	154	58.8
Unhealthy	108	41.2
Oral health		
Very good	12	4.6
Good	128	48.9
Poor	102	38.9
Very poor	20	7.6
Frequency of dentist visits		
Once a year	27	10.3
Whenever I have a problem with my teeth	235	89.7
Frequency of brushing teeth/dentures		
Twice a day or more	35	13.4
Once a day	117	44.7
Every 2–3 days	70	26.7
Weekly/Monthly	40	15.3
Never	35	13.4
Use of fluoride toothpaste		
Yes	99	37.8
No	163	62.2
Use of dental floss		
Yes	5	1.9
No	257	98.1
Use of prosthetic dentures		
1–5 years	34	13.0
6–10 years	135	51.5
≥11 years	93	35.5
Feeling of dry mouth		
All the time	6	2.3
Often	88	33.6
Sometimes	125	47.7
Never	43	16.4
Teeth clenching and grinding		
All the time	9	3.4
Often	57	21.8
Sometimes	122	46.6
Never	74	28.2

3.2 | Validity findings

Opinions received from nine experts were analyzed, and CVI value of the scale was calculated. Individual item scores were calculated using the Davis technique. The number of experts who gave a score of “3” (quite convenient) or “4” (extremely convenient) to an item was divided by the total number of experts.²³ The total item score was calculated to be 0.90 by adding the individual item scores and dividing the value by the total number of items in the scale. To assess criterion-related validity and concurrent validity, OHATE was evaluated together with GOHAI. Spearman correlation analysis was performed to assess the correlation between the OHATE and GOHAI scores. The correlation coefficient was found to be -0.719 , which revealed a moderate negative correlation ($p < .001$; $n = 262$).

The KMO value was found to be 0.867. In addition, Bartlett's Sphericity value was found to be 527.253 ($p < .001$). EFA was performed, and a two-factor structure was obtained. Accordingly, seven items were grouped within the first factor, and three items were grouped within the second factor. The variance explained by the first factor was 38.146% and that explained by the second factor was 22.044%. The total variance explained by the two factors was 60.19%.

Table 3 shows the factor loads and t and p values of the scale items provided by CFA. Accordingly, factor loads varied between 0.28 and 0.90, and t -values varied between 2.36 and 13 ($p < .001$). The findings obtained in the present research regarding the structural equation model, the goodness of fit indices, and reference range for acceptable goodness of fit values are shown in Table 4. All the values obtained were within the reference range for good/acceptable goodness of fit.

3.3 | Reliability findings

The Cr α coefficient was calculated to assess the reliability of the scale. The coefficient was calculated to be 0.869 for the first factor and 0.711 for the second factor. The coefficient for the overall scale was 0.865. Values approaching one indicated that the internal consistency of the scale was high.²⁴ The item-specific mean and standard deviation, item–test correlations, and the Cr α coefficient when an item is removed from the scale are shown in Table 5. The Cr α coefficient when each item was removed from the scale varied between 0.564 and 0.866. In addition, the item–test correlation values ranged between 0.475 and 0.797, and all values were > 0.30 . This result showed that the item and

TABLE 3 Findings obtained from confirmatory factor analysis

Items	Factor loading	t value	p value
First factor			
Lymph nodes	0.69	8.56	<.001
Lips	0.77	10.27	<.001
Tongue	0.81	11.15	<.001
Tissue inside cheek, floor and roof of mouth	0.90	13.00	<.001
Saliva (effect on tissue)	0.51	6.12	<.001
Condition of artificial teeth	0.70	9.00	<.001
Oral cleanliness	0.76	10.02	<.001
Second factor			
Gums between teeth and/or under artificial teeth	0.64	6.57	<.001
Condition of natural teeth	0.28	2.36	<.001
Pairs of teeth in chewing position (natural or artificial)	0.57	5.95	<.001

TABLE 4 Goodness of fit indices and reference ranges of the study

Goodness of fit indices	Findings first of the study	Post-modification findings	Reference ranges of the good fit value	Reference ranges of the acceptable good of fit value
χ^2	88.22 (df = 24)	62.03 (df = 31)	$0 \leq \chi^2 \leq 2df$	$2df < \chi^2 \leq 3df$
p	0	0.0007	$0.05 < p \leq 1.00$	$0.01 \leq p \leq .05$
χ^2/df	3.67	2	$0 \leq \chi^2/df \leq 2$	$2 < \chi^2/df \leq 3$
RMSEA	0.11	0.08	$0 \leq RMSEA \leq 0.05$	$0.05 < RMSEA \leq 0.08$
GFI	0.88	0.91	$0.95 \leq GFI \leq 1.00$	$0.90 \leq GFI < 0.95$
AGFI	0.81	0.85	$0.90 \leq AGFI \leq 1.00$	$0.85 \leq AGFI < 0.90$
CFI	0.94	0.97	$0.97 \leq CFI \leq 1.00$	$0.95 \leq CFI < 0.97$
NFI	0.92	0.95	$0.95 \leq NFI \leq 1.00$	$0.90 \leq NFI < 0.95$

χ^2 , Chi-Square; χ^2/df , Chi-square divided by the degrees of freedom; RMSEA, Root Mean Square Error of Approximation; GFI, Goodness of Fit Index; AGFI, Adjusted Goodness of Fit Index; CFI, Comparative Fit Index; NFI, Normed Fit Index.

TABLE 5 Item mean and standard deviation scores, item-Test correlations, and Cronbach's α coefficient when an item is removed

Factors	Items	Mean \pm SD	Item-test correlation	Cronbach's α coefficient when item is removed
First Factor	Lymph nodes	0.49 \pm 0.61	.619	.854
	Lips	0.41 \pm 0.59	.655	.850
	Tongue	0.33 \pm 0.58	.633	.853
	Tissue inside cheek, floor and roof of mouth	0.46 \pm 0.64	.797	.829
	Saliva (effect on tissue)	0.52 \pm 0.56	.520	.866
	Condition of artificial teeth	0.48 \pm 0.67	.638	.852
	Oral cleanliness	0.86 \pm 0.75	.667	.849
Second Factor	Gums between teeth and/or under artificial teeth	0.46 \pm 0.57	.475	.686
	Condition of natural teeth	0.81 \pm 0.64	.547	.600
	Pairs of teeth in chewing position (natural or artificial)	0.66 \pm 0.67	.575	.564

test scores were highly concordant, and item validity was considerably high (Table 3).

Test–retest reliability analysis was performed to ensure that the Turkish form was reliable despite changing conditions. A pilot test–retest study was conducted with 40 people, and the retest was performed after 14 days. Correlation analysis was done to check the findings. The correlation coefficients vary between zero and one. Higher values indicate higher reliability. The correlation coefficient between the test and retest scores obtained by the participants of the pilot study was 0.95 ($p < .001$). The cutoff value for test–retest reliability analyzed by Pearson correlation analysis is 0.70. Since, the coefficient obtained in the present study was >0.70 , it was concluded that the test–retest reliability was high. Kendall's coefficient of concordance was calculated to evaluate interobserver agreement. Independently, two nurses, one clinician nurse, and the academician nurse, applied the tool to 40 elderly individuals. Kendall's W value was found to be 0.979.

4 | DISCUSSION

Thapa et al. examined different valid and reliable assessment tools used by healthcare professionals other than dentists to evaluate oral health in elderly individuals living in nursing homes.¹⁵ Ten tools were assessed in this study, and OHATE was reported to be a valid and reliable assessment tool. In this context, the present research was conducted to assess the validity and reliability of OHATE both in community-dwelling elderly individuals and nursing home residents in Turkey.

In the original study, Kayser-Jones et al. found the mean OHATE scores of nursing home residents to be 5.06 ± 2.81 . In the present research, the mean OHATE score was 5.40 ± 4.32 .¹⁸ In the study of Kayser-Jones et al., the mean age of the participants was 82.00 ± 11.08 years and the mean number of teeth was 9.08 ± 9.84 .¹⁸ In the present research, the mean age of the participants was 72.15 ± 6.93 years, and the mean number of teeth was 13.12 ± 4.97 .

To assess the validity of the Turkish version of OHATE, content validity, criterion-based and concurrent validity, and construct validity were examined. CVI was determined using the Davis technique and was found to be 0.90. Based on the expert opinions for the 10 items, a concurrent validity rate of 90% was obtained.²⁴ Accordingly, it was concluded that the scale was successful in measuring oral health and had a high representative power. Construct validity was assessed using EFA and CFA. While a single-factor structure was obtained in the original scale by Kayser-Jones et al., EFA revealed a two-factor structure in the present research.¹⁸ Accordingly, seven items were included in the first factor, and three items were included

in the second factor. The first factor explained 38.146% of the variance, whereas the second factor explained 22.044% of the variance in the scale. The total variance explained was 60.19%.

When the goodness of fit indices for the two-factor structure were analyzed, the χ^2/df value obtained by dividing the χ^2 value by the degree of freedom was found to 2. Conflicting opinions exist in the literature regarding this value. Some studies argue that this value must be below 2 or 3.²⁵ The value obtained in the present research shows that the scale has excellent goodness of fit. The root mean square error of approximation value obtained in the present research was 0.08, which also indicates that the scale has acceptable goodness of fit. In the literature, a GFI value > 0.90 and an AGFI value > 0.85 suggest that the model has acceptable goodness of fit. In the present research, the GFI value was 0.91 and the AGFI value was 0.85. CFI values > 0.97 and NFI values > 0.95 signify that the model in question has a perfect fit. In the present research, the CFI value was 0.97 and the NFI value was 0.95 (Table 4). However, there is still no consensus in the literature regarding which goodness of fit indices should be used in the structural equation model and which ones should be accepted as standard tools for evaluating models.²⁶

To determine whether the standardized values obtained in the CFA analysis for each item were significant, the t-values were examined in the present research. The t-values in the path diagram become significant at $p < .05$ when they exceed 1.96, and they become significant at $p < .01$ when they exceed 2.56. The t-values obtained for the model examined in the present research varied between 2.36 and 13 (Table 3). Accordingly, the t-values obtained for all items in the scale were statistically significant at $p < .05$. In addition, item factor loads obtained in the present research varied between 0.28 and 0.90, which suggested that the items represented the factor at a good level. In summary, when goodness of fit indices obtained from confirmatory factor analyses are evaluated as a whole, it can be said that OHATE Turkish version has decent overall goodness of fit and can be applied to the Turkish population.

Reliability of a scale is assessed using test–retest reliability and Cr α internal reliability coefficient. In the present research, the Cr α coefficient for the overall scale was found to be 0.86. Furthermore, the coefficients when each item was removed varied between 0.56 and 0.86. Thus, it was concluded that the Turkish version of the scale had high internal consistency, with varying internal consistency when different items were removed.

Whether different items in a scale measure the same dimension is assessed by their summability, the measure of which is correlation. Correlation coefficients vary between 0 and 1. Higher values indicate higher correlation.

Spearman correlation analysis was performed to assess the correlation between the OHATE and GOHAI scores. The correlation coefficient was found to be -0.719, which revealed a moderate negative correlation. Higher scores obtained in GOHAI indicate good oral health, whereas higher scores obtained in OHATE indicate poor oral health.^{17,18} Therefore, the correlation coefficient obtained in the analysis was negative.

In their study, Chalmers et al. examined intra- and inter-caregiver correlation coefficients and found the values to be 0.78 and 0.74, respectively.²⁷ In the present research, Kendall's coefficient of concordance was calculated to evaluate the concordance between the observers, and the value was found to be 0.979. In the present research, the coefficient of concordance was calculated between the clinician nurse and the academician nurse. Concordance between the dentist and the nurse should also be examined in future studies.

Kayser-Jones et al. found the test-retest reliability of OHATE to be 0.88. In the present research, the test-retest reliability coefficient was observed to be 0.95.¹⁸ In this study, two scales were applied simultaneously to demonstrate the reliability. Based on this methodology, both the EFA and CFA analyses revealed that the Turkish version of OHATE was valid and reliable.

Limitations of the research: The findings obtained in the present research can only be generalized to the research sample. Although, the FHCs with the largest patient pool in the central districts of Konya were selected, the use of purposive sampling is a limitation of the research. Although, the research was conducted in multiple centers (FHCs and nursing homes), the fact that the centers were located in a single province is another limitation.

5 | CONCLUSION

The Turkish version of OHATE is a valid and reliable tool to assess oral health in community-dwelling elderly individuals and those living in nursing homes. Nurses working in nursing homes and FHCs can use the Turkish version of OHATE to assess oral and dental health in elderly individuals, inform and guide patients preemptively. We recommend that the Turkish version of OHATE be used in future studies to obtain comprehensive data.

AUTHOR CONTRIBUTION

Fatma Zehra Genç: Conceptualization, Methodology, Investigation, Data curation, Formal analysis, Writing – original draft. Dilek Cingil: Conceptualization, Methodology, Formal analysis, Writing–review & editing. Filiz

Hisar: Conceptualization, Writing – original draft, Writing –review & editing, Supervision.

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CONFLICT OF INTEREST

The authors have no conflicts to report.

ETHICAL CONSIDERATIONS

Ethical approval was obtained from the ethics committee of Necmettin Erbakan University (2020/2593) prior to data collection. Furthermore, the necessary written permissions were obtained from the institutions where the research was to be conducted. Permission to use OHATE and GOHAI was obtained from the relevant authors via email. Last, consent was obtained from all participants.

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