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ARAŞTIRMA / RESEARCH

Psychometric properties of the Oral Health Assessment Tool Turkish version

Ağız Sağlığı Değerlendirme Aracı Türkçe versiyonu'nun psikometrik özellikleri

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Abstract

Purpose: The aims of this study were to conduct validity and reliability assessments of Turkish version of Oral Health Assessment Tool.

Materials and Method: The Oral Health Assessment Tool underwent forward and backward Turkish translations and content validity assessments. After modifications, the final instrument was used to assess the oral health of 100 Turkish nursing home residents. Inter-rater reliability and internal consistency assessments were obtained based on its use in this sample. Discriminant validity analyses were conducted using item average points for the top and bottom groups.

Results: Content validity indices from 6 experts exceeded 0.80. Discriminative validity, using the top and bottom averaged scores, was supported for all of the categories save dental pain. Inter-rater reliability for the individual categories ranged from 0.54-1.00 (Kappa statistic) and was 0.72 (Spearman's Correlation Coefficient) for the overall instrument.

Conclusion: The Turkish version of Oral Health Assessment Tool was found to be both valid and reliable for cognitively intact nursing home residents. Additional testing with cognitively-impaired nursing home residents is warranted

Keywords: Oral health, aged, nursing, validity, reliability

Öz

Amaç: Bu çalışmanın amacı, Ağız Sağlığı Değerlendirme Aracı'nın Türkçe versiyonunun geçerlilik ve güvenilirlik değerlendirmelerini yapmaktır.

Gereç ve Yöntem: Ağız Sağlığı Değerlendirme Aracı'nın Türkçe ve geri çevirileri yapılarak kapsam geçerlilik indeksi değerlendirilmiştir. Son hali verilen araç ile huzurevinde yaşayan 100 yaşlının ağız sağlığı değerlendirilmiştir. Gözlemciler arası güvenirlik ve iç tutarlık değerlendirmeleri yapılmıştır. Üst ve alt gruplar için madde ortalama puanları kullanılarak diskriminant geçerlik analizleri yapılmıştır.

Bulgular: Araç altı uzman tarafından değerlendirilmiş ve kapsam geçerlilik indeksi 0,80'inin üzerinde bulunmuştur. Üst ve alt ortalama puanları kullanan diskriminant geçerlik, diş ağrısı kategorisi hariç tüm kategoriler için desteklenmiştir. Her bir kategori için gözlemciler arası güvenilirlik, 0.54-1.00 (Kappa istatistiği) arasında değiştiği, toplam puan için Spearman'ın Korelasyon katsayısı 0.72 bulunmuştur.

Sonuç: Ağız Sağlığı Değerlendirme Aracı Türkçe versiyonu huzurevinde yaşayan bilişsel olarak sağlam yaşlılar için geçerli ve güvenilir bulunmuştur. Huzurevinde yaşayan bilişsel bozukluğu olan yaşlılar için de geçerlik ve güvenirlik çalışmasının yapılması önerilmektedir.

Anahtar kelimeler: : Ağız sağlığı, yaşlı, hemşirelik, geçerlilik, güvenirlik

INTRODUCTION

Oral health is important for continuing and enhancing the quality of life and general health of older adults who are 65 years and over[1, 2]. Tooth loss, periodontal disease, dental caries and xerostomia (dry mouth) are all common complaints in older adults.[3] These problems negatively affect the nutritional status, physical health, and social functioning of older adults[4]. Tooth loss and periodontal disease have been associated with coronary heart diseases[5-8], atherosclerosis[9, 10], stroke[8,11,12], cerebral vascular disease[13,14], diabetes mellitus[15,16] and poor mental health.[17,18] Poor oral health, impaired swallowing, and diminished cough reflexes are associated with

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aspiration pneumonia in older adults who are dependent on others for care[19-22].

In the United States and Europe, older adults living in nursing homes have significant oral health problems consistent with poor oral hygiene[23-25]. In Turkey, little is known about the oral health of the 24,000 people residing in 352 nursing homes. Part of the problem is the lack of a standardized oral health assessment tool that can be appropriately used by Turkish nurses. In the United States, the Oral Health Assessment Tool (OHAT) was developed specifically for use by both licensed nurses and unlicensed nursing assistants caring for older adults both with and without cognitive impairment[26].

The aims of this study were to 1) translate the original English version of OHAT into a Turkish version, and 2) to assess the reliability and validity of the Turkish version in a sample of Turkish nursing home residents.

MATERIALS AND METHODS

The study protocol was officially approved, and ethical clearance was obtained from the Ethical Committee of Hacettepe University (decision number: GO16/304-16, date: 26.07.2017). Permission was received from the nursing home affiliated with the Family and Social Politics Ministry. The nursing home's social worker identified residents who were able to make their own decisions. The participants were informed about the aim of the study and were told that their participation was voluntary and that they could withdraw from the study. Those individuals who agreed to participate signed the informed consent form.

Analysis of language equivalence (the translation process)

Permission to adapt the OHAT into Turkish, and to test its validity and reliability, was obtained by e-mail from the Iowa Geriatric Education Center. The original OHAT consisted of eight categories: lips, tongue, gums and tissues, saliva, natural teeth, dentures, oral cleanliness, and dental pain. Components were scored 0 (healthy), 1 (changes), or 2 (unhealthy). The total score was obtained by summing the scores of all eight categories and ranged from 0 (very healthy) to 16 (very unhealthy). If individuals get 1 or 2 scored for any category, should be provided to examine by a dentist. The original authors of the OHAT found the instrument to be both a reliable and valid screening assessment tool in nursing home populations, including cognitively-impaired older adults. The original authors of the instrument obtained internal consistency using test–retest percent agreements and intra and intercarer correlation coefficients for total scores. Intracarer total OHAT scores achieved a correlation coefficient of .78 (p= .001); intercarer total OHAT scores achieved a correlation coefficient of .74 (p= .001) [26].

Three nursing experts in the fields of geriatrics and oral health separately translated the OHAT from English to Turkish. The principal investigator consolidated the translations into a Turkish version of the OHAT. Next, this Turkish translation of the OHAT was separately back-translated from Turkish to English by a language expert who knew both languages as a native speaker. The back-translated English version was compared to the original English version of the OHAT for meaning and similarity by a native English expert speaker. Following the recommendations made by the expert, the tool was finalized by making relevant changes. For example, the English words "lump" and "patches" presented translation difficulties when the instrument was back-translated from Turkish to English. This issue was resolved by using alternative Turkish words that better captured the meaning of the English words. The final Turkish version contained the same eight items with the same scoring categories.

Analysis of content validity

In order to evaluate the Turkish OHAT in terms of its suitability to Turkish culture, language equivalence, and content validity, six experts in nursing and dentistry reviewed the Turkish OHAT. The Content Validity Index (CVI) was used in the expert review evaluations. The six experts were asked to evaluate each of the 8 categories as well as the 3 descriptors for each category, for a total of 32 items (see Table 1, below).

The evaluation criteria were 1=not appropriate, 2=somewhat appropriate (the item and the statement should be revised), 3=appropriate (minor changes needed), and 4=very appropriate. The CVI score was determined by dividing the number of experts who gave 3–4 points by the total number of experts altogether. All CVI scores exceeded 0.80. Criterion validity could not be assessed because there was no similar scale measuring the oral health of older adults from nurses that was valid and reliable in the Turkish

language.

Discriminative validity and reliability procedures

Discriminative validity was assessed using an item analysis technique. Reliability was assessed using inter-rater reliability. The OHAT is a formative index; therefore, assessing internal consistency measurements using Cronbach's alpha was inappropriate[27].

Sample for validity and reliability procedures

The study sample was composed of older adults living in a nursing home in Ankara, Turkey. This nursing home served 250 residents. Sampling inclusion criteria were being 65 years of age or older, ability to communicate, lack of hearing impairment, lack of dementia or any psychiatric disorder, and volunteering to participate in the study. Sampling inclusion criteria were met from 140 older adults but only 100 older adults agreed to participate. Polit and Yang, recommend sample sizes of 25 to 50 participants when pretesting a new instrument. We enrolled 100 older adult volunteers from the nursing home[27].

Data collection

Demographic data were collected using a questionnaire. Information included were age, gender, educational level, and lists of chronic diseases. The Turkish Oral Health Assessment Tool was used to collect oral health variables.

Participants were examined individually in a chair or in a bed in their rooms. An abeslang (tongue spatula) and natural light were used. The examinations were performed in random order and at different dates by Nurse 1 and Nurse 2 between November 6 and 24, 2017. Nurse 1 was the principal investigator. She had been trained in the administration and scoring of the English OHAT while a visiting scholar and a member of a research team in the United States that had extensively used the English OHAT[28, 29]. Nurse 2 was a bachelor's prepared nurse with 11 years' experience in working at the nursing home. The principal investigator trained Nurse 2 on the administration of the Turkish OHAT. Nurse 1 examined all of the 100 older adults using the Turkish OHAT. Nurse 2 examined 30 of the 100 within one week of the initial examination, also using the Turkish OHAT.

Table 1. Expert evaluations of the OHAT and content validity index values of items (n:6)

Categories	4 point	3 point	2 point	1 point	CVI
1-Lips	6	0	0	0	1
1a-Smooth, pink, moist	6	1	0	0	1
1b-Dry, chapped, or red at corners	4	1	1	0	0.83
1c-Swelling or lump, white/red/ulcerated patch; bleeding/ulcerated at corners	4	2	0	0	1
2- Tongue	6	0	0	0	1
2a-Normal, moist, roughness, pink	6	0	0	0	1
2b-Patchy, fissured, red, coated	4	2	0	0	1
2c-Patch that is red and/or white, ulcerated, swollen	4	1	1	0	0.83
3- Gums and tissues	5	1	0	0	1
3a- Pink, moist, smooth, no bleeding	4	1	1	0	0.83
3b-Dry, shiny, rough, red, swollen, one ulcer/sore spot under dentures	4	2	0	0	1
3c- Swollen, bleeding gums, ulcers, white/red patches, generalized redness or ulcers under dentures	3	3	0	0	1
4- Saliva	6	0	0	0	1
4a- Moist tissues, watery and free-flowing saliva	4	2	0	0	1
4b- Dry, sticky tissues, little saliva present	5	1	0	0	1
4c-Tissues parched and red, very little/no saliva, present, saliva very thick	4	2	0	0	1
5- Natural teeth Yes/No	3	3	0	0	1
5a-No decayed or broken teeth/roots	3	3	0	0	1
5b- 1-3 decayed or broken teeth/ roots or teeth very worn down	3	3	0	0	1

5c-4 or more decayed or broken teeth/roots, or fewer than 4 teeth, or very worn down teeth	5	1	0	0	1
6- Dentures Yes/No	4	1	1	0	0.83
6a-No broken areas or teeth, dentures regularly worn	2	3	1	0	0.83
6b- 1 broken area/ tooth or dentures only worn for 1-2 hrs daily, or loose dentures	3	2	1	0	0.83
6c- More than 1 broken area/tooth, denture missing or not worn, needs denture adhesive	3	2	1	0	0.83
7- Oral cleanliness	6	0	0	0	1
7a- Clean, no food particles or tartar in mouth or on dentures	3	3	0	0	1
7b- Food particles/ tartar/ plaque in 1-2 areas of the mouth or on small area of dentures or bad breath	3	3	0	0	1
7c- Food particles/tartar/plaque in most areas of the mouth or on most of dentures or severe halitosis (bad breath)	3	3	0	0	1
8- Dental pain	3	3	0	0	1
8a- No behavioral, verbal, or physical signs of dental pain	3	3	0	0	1
8b- Verbal &/or behavioral signs of pain such as pulling at face, chewing lips, not eating, aggression	3	3	0	0	1
8c- Physical signs such as facial swelling, sinus on gum, broken teeth, large ulcers, and verbal and/or behavioral signs such as pulling at face, chewing lips, not eating, aggression	5	1	0	0	1

Table 2. Characteristics of nursing home participants

	n	%
Gender		
Female	49	49
Male	51	51
Age		
65-74	41	41
75-84	45	45
85 and over	14	14
Education Level		
Illiterate	43	43
Primary and secondary school	45	45
High school and over	12	12
Any Chronic Disease (Yes)	70	70
Hypertension (Yes)	70	70
Diabetes Mellitus (Yes)	31	31
Chronic Obstructive Pulmonary Disease (Yes)	27	27
Chronic Artery Disease (Yes)	42	42
Other Diseases (e.g. osteoporosis, prostate cancer, psychiatric illnesses) (Yes)	23	23
Total	100	100

Statistical analysis

Statistical analyses were performed using the IBM SPSS Statistics version 23 programming package. Item analysis (discriminative validity) was conducted by calculating item average points for 27% of the top and bottom groups. Inter-rater reliability was assessed by calculatting the Kappa statistic for the individual categories and a Spearman's correlation coefficients for the overall instrument.

RESULTS

Table 2 provides the characteristics of the 100 paticipants. A total of 51 (51%) participants were male. The largest number of participants (45%, n:45) were in the 75-84 age range. Almost half (43%) were illiterate. Most of them (70%, n:70) had at least one chronic disease.

Validity and Reliability Results for the Turkish OHAT

The Turkish OHAT scores for the participants are listed in Table 3. Discriminative validity was determined using an item analysis technique based on the Turkish OHAT examinations conducted by Nurse 1. The data were divided into two groups: the top group was comprised of the highest 27% of the scores whilst the bottom group was comprised of the lowest 27% of the scores. All Turkish OHAT categories except dental pain were statistically significant (Table 4).

The kappa statistic was calculated to evaluate the inter-rater agreement of the individual 8 categories of the Turkish OHAT (Table 5). The inter-rater Kappa statistic was in the moderate range (0.54) for saliva. The lips, tongue, gums and tissues, natural teeth and oral cleanliness categories had an inter-rater Kappa statistic in the ranges of 0.66 -0.80, indicating substantial agreement. The Kappa statistic was in perfect agreement (1.00) for assessing dentures. Spearman's correlation coefficient was calculated for the inter-rater reliability of the total Turkish OHAT instrument, 0.72. All inter-rater analyses were statistically significant except for dental pain, in spite of the complete agreement.

Table 3. Frequencies of OHAT categories for nursing home residents (n=100)

n(%)	Healthy	Changes	Unhealthy	Total
Lips	81 (81%)	18 (18 %)	1 (1%)	100
Tongue	59 (59%)	36 (36%)	5 (5%)	100
Gums and tissues	89 (89%)	10 (10%)	1 (1%)	100
Saliva	86 (86%)	13 (13%)	1 (1%)	100
Natural teeth (n:52)	22 (42.3)	18 (34.6%)	12 (23.1%)	52
Dentures (n:57)	46 (80.7%)	5 (8.8%)	6 (10.5%)	57
Oral cleanliness	37 (37%)	60 (60%)	3 (3%)	100
Dental pain	97 (97%)	3 (3%)	-	100

Table 4. Item average points for 27% of top and bottom groups for individual OHAT categories

	t	p
Lips	3.47	.000*
Tongue	6.14	.001*
Gums and tissues	3.69	.000*
Saliva	3.18	.003*
Natural teeth	5.13	.000*
Dentures	3.75	.002*
Oral cleanliness	4.21	.000*
Dental pain	-1.00	.327
*p<0.05		

Table 5. Inter-rater reliability for individual OHAT categories and total score.

	Percent agreement	Kappa statistic	CI Lower Bound	CI Upper Bound
Lips	90	.76*	0.53	1.00
Tongue	86	.77*	0.56	0.98
Gums and tissues	86	.69*	0.42	0.97
Saliva	80	.54*	0.22	0.86
Natural teeth	87.5	.78*	0.50	1.00
Dentures	100	1.00*	1.00	1.00
Oral cleanliness	83	.66*	0.41	0.91
Dental pain	100	1.00	-	-
Total score	Spearman's Correlation Coefficent			0.72*

*p<0.05; CI: Confidence interval

DISCUSSION

These purposes of this study were to translate the English OHAT into Turkish and to conduct validity and reliability analyses on the translated instrument. We found that the Turkish OHAT was an overall valid and reliable screening tool for a cognitively intact nursing home population. This instrument joins Portuguese and Japanese versions, which have also been found to be reliable and valid in nursing home populations[30, 31]. The Japanese study included persons with cognitive impairments; the Portuguese study did not[30,31].

Nursing home research, especially research conducted by doctorally-prepared nurses, is in its infancy in Turkey. We opted, for this study, to exclude cognitively impaired residents due to system-imposed barriers for obtaining consent from family members or legally-authorized representatives, as is routinely done in the United States[28,32]. The primary author plans to repeat aspects of this study and including cognitively-impaired nursing home residents.

Another interesting finding is the high rate of illiteracy among nursing home residents in our sample (43%). Illiteracy in older Turkish adults is a well-known problem[34]. Other researchers have modified or developed instruments specifically for illiterate older adults, especially instruments for dementia screening[33,34]. Although the OHAT instrument was used by nurses, and not self-administered, we are concerned about the consistent lack of endorsement around the category, "dental pain". Both nurses received only 3 positive responses regarding dental pain. We are unsure if the responses are due to low literacy levels and the need for simpler terms, or cultural colloquialisms, to capture the presence of mouth and/or dental pain. The same situation occurred in other studies where the majority of the participants scored 0 on dental pain but were cognitively impaired[33, 34]. Dental pain, however, as a category is too important to be excluded from the Turkish OHAT despite poor psychometric results.

In order to test inter-rater agreement, the kappa coefficient was calculated. According to the Kappa statistic and percent agreement, OHAT evaluation showed a moderate, substantial and almost perfect agreement between the evaluations by nurse 1 and nurse 2. It was showed that kappa statistics being considered moderate of OHAT Portuguese and Japanese versions[31-32].

The Spearman's correlation coefficient for inter-rater OHAT total score was calculated (.72). In this study, it was found a high positive correlation coefficient for inter-rater reliability for the total OHAT score. It can be said there is an agrement between observer for the total OHAT score. In the original verison of OHAT, also, was found high positive correlation coefficient for inter-rater reliability (.74).

The validity and reliability of the Turkish version of the OHAT was assessed in cognitively intact, low-literate older adults residing in a nursing home. This instrument is a promising screening tool for assessing the oral health of older adults in nursing facilities. The Turkish OHAT has the potential to assist nurses with the evaluation and planning of appropriate oral health interventions. Additional testing is needed with cognitively-impaired older adults.

Yazar Katkıları: Çalışma konsepti/Tasarımı: NEŞ; Veri toplama: NEŞ; Veri analizi ve yorumlama: NEŞ, RAJ; Yazı taslağı: NEŞ, RAJ; İçeriğin eleştirel incelenmesi: RAJ; Son onay ve sorumluluk: NEŞ, RAJ; Teknik ve malzeme desteği: -; Süpervizyon: NEŞ; Fon sağlama (mevcut ise): yok.
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