

The Validity and Reliability of a Turkish Version of the Alzheimer's Disease Knowledge Scale (ADKS)

Alzheimer Hastalığı Bilgi Ölçeği'nin Türkçe Geçerlik ve Güvenilirlik Çalışması

Fikriye YILMAZ^a, Meriç YAVUZ ÇOLAK^b

^aDepartment of Healthcare Management, Başkent University Faculty of Health Sciences, Ankara, TURKEY

^bDepartment of Biostatistics, Başkent University Faculty of Medicine, Ankara, TURKEY

This study was presented as an oral presentation at II. International Conference on Public Health, 16-17 March 2018, İstanbul, Turkey.

ABSTRACT Objective: The aim of the study is to evaluate the validity and reliability of Turkish version of the Alzheimer's Disease Knowledge Scale (ADKS). **Material and Methods:** In this methodological study, the data of the study were collected by a questionnaire consisting of socio-demographic information, questions about dementia experience and ADKS Turkish form. The sample of the study is a total of 600 people consisting of university students, adults aged 50 years and over and caregivers of Alzheimer's patient. **Results:** Participants' ADKS scores ranged from 7 to 26, with an average of $16,17 \pm 2,93$. Kendall's W coefficient was calculated as 0.79 ($p < 0.05$). ADKS score was found to be higher in the subgroup of caregivers, among people who had family members with dementia, and among caregivers of dementia patients ($p < 0.05$). The difficulty indices of the items are between 0.24 and 0.75; the discrimination indices are above 0.10. The results of reliability analysis showed that the test-retest reliability correlation coefficient was 0.81, the Kuder-Richardson 20 coefficient was 0.74, and the correlations of the items with the total score were above the standard value of 0.20. **Conclusion:** It was concluded that Turkish version of ADKS was a reliable and valid scale with adequate psychometric properties.

ÖZET Amaç: Çalışmanın amacı, Alzheimer Hastalığı Bilgi Ölçeğinin (ADKS) Türkçe geçerlilik ve güvenilirliğini değerlendirmektir. **Gereç ve Yöntemler:** Metodolojik araştırma olarak planlanan çalışmanın verileri sosyo-demografik bilgiler, demans deneyimi ile ilgili sorular ve ADKS Türkçe formundan oluşan anket ile toplanmıştır. Çalışmanın örneklemini üniversite öğrencileri, 50 yaş ve üzeri yetişkinler ve Alzheimer hastasına bakım verenler alt gruplarından oluşan toplam 600 kişidir. Ölçeğin geçerliliği; kapsam geçerliliği ve yordama geçerliliği ile değerlendirilmiştir. Ölçeğin madde analizleri kapsamında madde güçlük ve madde ayırt edicilik indeksleri hesaplanmıştır. Ölçeğin güvenilirliğini test etmek için test-tekrar test güvenilirliği, iç tutarlılık katsayısı ve düzeltilmiş madde-toplam korelasyonu katsayıları hesaplanmıştır. **Bulgular:** Katılımcıların ADKS puanı 7 ile 26 arasında dağılım göstermekte olup ortalaması $16,17 \pm 2,93$ olarak hesaplanmıştır. Ölçeğin Kendall's W sayısı 0,79 olarak hesaplanmıştır ($p < 0,05$). ADKS ölçek puanının bakım verenler alt grubunda, ailesinde demanslı birey bulunanlarda ve demanslı bireye bakım verenlerde daha yüksek olduğu belirlenmiştir ($p < 0,05$). Ölçekteki maddelerin güçlük indeksleri 0,24 ile 0,75 arasında; ayırt edicilik indeksleri 0,10'un üzerindedir. Ölçeğin güvenilirliğinin değerlendirilmesinde incelenen test-tekrar test güvenilirliği korelasyon katsayısı 0,81, Kuder-Richardson 20 katsayısı 0,74 olarak hesaplanmış, maddelerin toplam puanla korelasyonları da standart değer 0,20'nin üzerinde belirlenmiştir. **Sonuç:** ADKS'nin Türkçe versiyonunun yeterli psikometrik özelliklere sahip güvenilir ve geçerli bir ölçek olduğu sonucuna ulaşılmıştır.

Keywords: Alzheimer's disease; knowledge; health education; reliability and validity

Anahtar Kelimeler: Alzheimer hastalığı; bilgi; sağlık eğitimi; güvenilirlik ve geçerlilik

Dementia, one of the diseases with the greatest increase in frequency and prevalence in aging societies, is a progressive and irreversible neurodegenerative disease.^{1,2} It is estimated that there are about

47.5 million individuals with dementia by 2015 around the world and 9.9 million new cases of dementia develop each year.³ Alzheimer's disease is the most common type of dementia and accounts for

Correspondence: Fikriye YILMAZ

Department of Healthcare Management, Başkent University Faculty of Health Sciences, Ankara, TURKEY

E-mail: fyilmaz@baskent.edu.tr



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about 60-80% of all dementia cases.⁴ Alzheimer's disease is a brain disease that affects the daily life of a person; characterized by impairment of high cortical functions such as memory, abstract thinking and decision-making and whose etiology is not yet fully understood.² According to the 2015 World Alzheimer's Report, there are 46.8 million Alzheimer's patients in the world.³ It is estimated that this figure will reach 74.7 million by 2030 and reach 131.5 million by 2050 in the report. It is known that there are about 600 thousand Alzheimer's patients in Turkey.⁵ It is expected that Turkey will be one of the four countries with the highest Alzheimer's disease in the world in 2050.⁶

Despite the increase in the prevalence of Alzheimer's disease, some prejudices stemming from inadequate information about the disease are thought to be common among the general public and even health professionals.^{7,8} It is estimated that 40-50% of Alzheimer's patients in high-income countries and 90-95% of low-income countries have lost their lives without being diagnosed or treated.⁴ Studies in Turkey show that there is a great lack of information about Alzheimer's disease in the community. According to a survey conducted with caregivers of Alzheimer's patients, 75% of their caregivers have no knowledge of the disease.⁶ According to another study, 83% of those surveyed think that the dementia is "normal" with age.^{6,9} Nielsen and Waldemar reported that in a study of 4 ethnic groups in Denmark, 51 Turkish immigrants had the lowest score in the Dementia Knowledge Scale and they perceived the dementia as a part of aging.¹⁰ The study conducted by Ergin et al. in Denizli reported the inadequacy knowledge of Alzheimer's disease of family physicians and interns.¹¹ The early diagnosis of Alzheimer's disease is of great importance and it can be delayed by measures taken at middle ages. For this reason, informing the public about the disease, raising awareness and announcing the developments is very important.¹²

In addition, studies have shown that having information about Alzheimer's disease and other types of dementia can be an important factor in improving the lives of dementia patients, both formal and informal caregivers.⁸ As people become more knowledgeable about dementia, it is stated that the prejudice

against dementia patients and the feelings of shame felt by dementia patients will diminish.¹³⁻¹⁶ Studies have also been conducted to prove that information about the disease is helping formal and informal caregivers to better care.^{8,17}

Social awareness of Alzheimer's disease has vital importance to draw attention to a disease that needs prevention and treatment strategies. In the written resources, it was not found a standard measurement tool for assessing knowledge of Alzheimer's disease of general population in Turkey. The purpose of the study is to test the validity and reliability of the Turkish version of Alzheimer's Disease Knowledge Scale (ADKS), which is currently the most widely used internationally to assess Alzheimer's knowledge level. Thus, it is believed that a standard data collection tool for studies to determine the level of knowledge related to Alzheimer's disease may contribute to efforts to increase social awareness about the disease.

MATERIAL AND METHODS

This methodological study was conducted in Ankara in April-May 2017. In order to test the validity and reliability of the Alzheimer's Disease Knowledge Scale by adapting to Turkish, written permission has been obtained from the responsible writer Brian Carpenter via e-mail.

This study was conducted in line with Helsinki Declaration principles. This study was approved by Baskent University Institutional Review Board and Ethics Committee (Project no: KA17/114) and supported by Başkent University Research Fund.

SAMPLE OF THE STUDY

In the written resources, the sample size in evaluating the psychometric properties of the scales were established to be between 2 and 20 times the number of items, and the sample size of the study was determined to be 600 individuals as 20 times the number of items. The sample group of the study was similar to the one in which the scale was developed and the studies adapted to different languages and was selected by convenience sampling.^{8,18} The study sample consists of 4 subgroups: i) 140 students attending

undergraduate education in health-related departments (medicine, nursing, social services, health management, physiotherapy, nutrition and dietetics) at a foundation university in Ankara, ii) 150 students attending undergraduate studies in the same university in non-health departments (engineering, architecture, law, business, economics, education, international relations), iii) 263 adults over 50 years old living in Çankaya district of Ankara, and iv) 47 caregivers between 18-65 years living in Ankara who undertaking the care of individuals with Alzheimer's diagnosis. Inclusion criteria for the study were determined as individuals who were literate, non-institutional, and without dementia diagnosis. It has been stated that the participation to the individuals meeting the inclusion criteria is voluntary and information is given about the purpose of the study. The Mini Mental State Test was administered to 50 years of age and older adults who agreed to participate in the study and adults passing the test with scores of 25 points or more was included in the sampling.¹⁹ It was not possible to calculate the return rate or the response rate of the questionnaire because the sample of the study was selected from different groups using convenience sampling method.

DATA COLLECTION TOOL

The data of the study were collected by a questionnaire consisting of two parts. The first part contains questions about demographic (age, gender), socio-economic (education, occupation, income) and dementia experience (family history of dementia, living with dementia individuals, being caregivers of dementia individuals, dementia-related training or courses).

In the second part, Turkish version of ADKS (ADKS-T) developed by Carpenter et al. is included.

The ADKS is a 30-item correct-false test to assess the level of knowledge about Alzheimer's disease with in one dimension. Scale items are related to the risk factors, evaluation, diagnosis, symptoms, course of the disease, life effects, care, treatment and management of Alzheimer's disease. The total score is obtained by collecting the correct answers given by the participants to the items (0-30). The higher the scale score, the higher the level of knowledge about

Alzheimer's disease. The scale study was found to be valid and reliable at an acceptable level in the study in which the Alzheimer's Disease Knowledge Scale was developed.¹⁸

STATISTICAL ANALYSIS

Statistical analyzes were performed in the SPSS 18 Package program (SPSS Inc., Chicago, IL, USA) and based on item analysis, validity analysis and reliability analysis.

Validity Analysis: The back translation method has been followed in the adaptation study of ADKS to Turkish.²⁰ First, the English version of the scale was translated into Turkish by three professional translators. In the second stage, Turkish forms were translated in English again by different translators and the consistency between the two forms was examined. Turkish forms were evaluated in terms of meaning and grammar and a single form was obtained.

The content validity of the scale was assessed by expert opinion. The scale items were examined by seven expert members working in the fields of Health Management, Family Medicine and Geriatric Nursing and scored on 4 rating system (1= item is necessary, 2= item is useful but not sufficient 3= item is useful but needs to be corrected, 4= item is unnecessary). The items requested to be corrected according to experts' opinions were re-examined and necessary corrections were made. Kendall's W analysis was conducted for the concordance between expert opinions. Finally, the intelligibility of the scale was assessed by pilot study of 30 students and 30 adults over 50 years of age who were not included in the sample group. No ambiguity or hesitation was encountered.

For the discriminant validity of the scale, the total score of the participants were assessed according to their subgroups and whether they had dementia patients in their family, living with the dementia individual in the same household, experience with being caregiver of dementia individual, and participation in training or courses related to dementia.

The normality of the total score of the scale was analyzed by the Kolmogorov-Smirnov test and it was determined that the scale was not appropriate normal

distribution ($p < 0.05$). The Mann-Whitney U test was used to compare the mean of the scale scores in the two groups and the Kruskal Wallis test was used in the multiple group variables.

Item Analysis: Item difficulty and item discrimination indices were calculated within the item analysis. For each item, the item difficulty index was calculated as a percentage of respondents who answered the item correctly. The item difficulty index between 20% and 80% is evaluated as appropriate. In addition, item discrimination index was calculated to determine the level of discrimination between individuals with high and low scores on each item. The item discrimination index is considered to be "good" if it is over 0.3, "enough" if it is between 0.1-0.3. According to the high-low 27 percent group method, item discrimination index was calculated by subtracting the percentage of respondents who correctly answered among the respondents who were in the top 27% of the total ranking and participants who were in the bottom 27% of the correct respondents.

Reliability Analysis: Reliability of the scale was evaluated by test-retest, internal consistency coefficient and item- total score correlation coefficients.

Test-retest reliability: 60 participants (30 students, 30 adults) who were not included in the sampling group answered the ADKS-T twice in a 2-day interval. Test-retest reliability was assessed by Spearman's rank correlation coefficient and Wilcoxon signed rank test.

Internal consistency: Kuder Richardson-20 was used for reliability of internal consistency of ADKS-T, since the items in the scale were measured in binary values (True and False). If the reliability coefficient is less than 0.40, the scale is considered "unreliable", "low" between 0.40-0.59, "high" between 0.60-0.79, and "very high" when it is above 0.80.

Item total score correlation coefficients: Correlation of the items with the total score was assessed by the point biserial correlation coefficient. Correlation coefficients are expected to be higher than 0.20 at statistically significant level.

RESULTS

According to their subgroups, the demographic, socioeconomic and dementia experiences of 600 participants are shown in [Table 1](#). The average age of the participants was 39.84 ± 19.51 years, 56.3% of them were male, average duration of education was 11.80 ± 2.78 years and the income of 70.3% of them was above the poverty line. It was found that 94.4% of the participants heard Alzheimer's disease, 15.3% had a family member with dementia diagnosis, 11.3% had lived with dementia individual in the same house, 13.3% of them have been caregiver for dementia individual, 6% of them had attended dementia training or course.

ADKS-T score of participants ranged from 7 to 26, with an average of 16.17 ± 2.93 .

RESULTS OF ITEM ANALYSIS

Item discrimination index: For the item discrimination index, the highest scores (upper 27%, $n = 172$) and lowest scores (lower 27%, $n = 172$) were determined on the 30 items in ADKS-T. It was determined that the highest scores were between 18 and 26 ($M = 19.80$, $SS = 1.39$) and the lowest scores were between 7 and 14 ($M = 12.63$, $SS = 1.41$). Then, for each item, the percentage of respondents who answered correctly to the item in the low and high score groups was calculated. To calculate the discrimination index for each item, the percentage of correct respondents in the low score category was subtracted from the percentage of correct respondents in the high score category. The discrimination indices of all items in the scale are above 0.10 and the average is calculated as 0.26 ± 0.09 ([Table 2](#)).

Item difficulty index: The item difficulty index was calculated as a percentage of respondents who answered the item correctly. The difficulty indices of the items in ADKS-T ranged from 0.24 to 0.75 and the average was determined as 0.53 ± 0.13 ([Table 2](#)). The item with the most correct answers from the participants is the first item related to life impact (80.83%). The item with which the participants respond most incorrectly is the second item related to risk factors (25.67%).

TABLE 1: Descriptive characteristics of the participants (n(%)).

	Total (n=600)	Students from health departments (n=140)	Students from non-health related (n=150)	Older adults related departments (n=263)	Dementia caregivers (n=47)
Age (Mean±SD)	39.84±19.51	21.26±1.41	21.96±1.88	59.15±7.65	42.76±18.9
Gender					
Female	281 (46.8)	82 (58.3)	56 (37.6)	111 (42.3)	32 (68.0)
Male	319 (53.2)	58 (41.7)	94 (62.4)	152 (57.7)	15 (32.0)
Birth place					
Village	81 (13.6)	4 (2.7)	2 (1)	70 (26.2)	5 (10.6)
District	185 (30.8)	34 (24.6)	30 (20)	106 (40.3)	15 (31.8)
Province	334 (55.6)	102 (72.7)	118 (79)	87 (33.1)	27 (57.6)
Education (Mean±SD)	11.80±2.78	12.75±0.62	12.96±0.86	10.66±3.58	11.74±3.05
Occupation					
Student	290 (48.3)	140 (100)	150 (100)	-	-
Housewife	62 (10.3)	-	-	48 (18.4)	14 (29.7)
Blue collar	86 (14.3)	-	-	77 (29.4)	9 (18.9)
White collar	162 (27)	-	-	138 (52.3)	24 (51.4)
Income^a					
<4.280 TL	177 (29.7)	34 (24.1)	22 (14.8)	110 (41.9)	11 (24.2)
≥4.280 TL	423 (70.3)	106 (75.9)	128 (85.2)	153 (58.1)	36 (75.7)
Awareness of Alzheimer's disease					
Yes	566 (94.4)	133 (95.2)	136 (90.8)	250 (95.2)	47 (100)
No	34 (5.6)	7 (4.8)	14 (9.2)	13 (4.8)	-
Dementia in family members					
Yes	87 (14.5)	8 (12.5)	12 (14.8)	24 (16.8)	43 (92.4)
No	513 (84.7)	132 (87.5)	138 (85.2)	239 (83.2)	4 (7.6)
Living with dementia individual					
Yes	68 (11.3)	6 (11.7)	10 (9)	11 (11.3)	41 (87.9)
No	532 (88.6)	134 (88.3)	140 (91)	252 (88.7)	6 (12.1)
Experience of caring for people with dementia					
Yes	66 (13.3)	10 (8.3)	4 (9)	5 (11.9)	47 (100)
No	534 (86.6)	130 (91.7)	146 (91)	258 (88.1)	-
Attending training/lecture about dementia					
Yes	36 (6.0)	29 (20.7)	2 (1.0)	2 (1.3)	3 (4.5)
No	564 (94.0)	111 (79.2)	148 (99.0)	261 (98.7)	44 (95.5)
ADKS-T	16.17±2.93	16.30±3.15	15.94±2.90	16.18±2.92	16.62±2.67
ADKS-T Cronbach alpha	0.74	0.79	0.75	0.76	0.74

^a Participants' household income was grouped under and above the consumption-based poverty line (TL 4.280 TL≈1.213 \$) according to the data of the Turkish Statistical Institute for the year of 2016.

VALIDITY RESULTS

Content Validity: The content validity of the scale was assessed by expert opinions and the Kendall's W analysis for the concordance between expert opinions was calculated to be statistically significant at Kendall's W 0.79 and $p < 0.001$.

Predictive validity: For the predictive validity of the scale, ADKS-T scores of the participants were compared according to subgroups (Figure 1, Table 1) and their dementia experience (Table 3). In the results of Kruskal-Wallis test to compare the mean scores of ADKS-T according to subgroups, it was determined

TABLE 2: The results of item analysis in ADKS-T.

Item	Percentage of correct answers	Difficulty Index	Discrimination Index	Item total correlation	Alpha if item dropped
People with AD are particularly prone to depression	80.83	0.75	0.110	0.398	0.713
It has been scientifically proven that mental exercise can prevent a person from getting AD	25.67	0.24	0.349	0.353	0.723
After symptoms of AD appear, the average life expectancy is 6-12 years	60.33	0.56	0.349	0.548	0.679
When a person with AD becomes agitated, a medical examination might reveal other health problems that caused the agitation	67.67	0.63	0.326	0.592	0.664
People with AD do best with simple instructions giving one step at a time	67.00	0.62	0.244	0.539	0.681
When people with AD begin to have difficulty taking care of themselves, caregivers should take over right away	25.83	0.24	0.105	0.198	0.758
If a person with AD becomes alert and agitated at night, a good strategy is to try to make sure that the person gets plenty of physical activity during the day	61.83	0.57	0.233	0.505	0.692
In rare cases, people have recovered from Alzheimer's disease	46.67	0.43	0.203	0.491	0.696
People whose AD is not yet severe can benefit from psychotherapy for depression and anxiety	70.50	0.66	0.314	0.568	0.671
If trouble with memory and confused thinking appears suddenly, it is likely due to AD.	46.33	0.43	0.221	0.449	0.708
Most people with AD live in nursing homes.	58.83	0.55	.0109	0.376	0.729
Poor nutrition can make the symptoms of AD worse	64.83	0.60	0.343	0.595	0.664
People in their 30s can have AD	60.00	0.56	0.331	0.569	0.673
A person with AD becomes increasingly likely to fall down as the disease gets worse	72.17	0.67	0.407	0.678	0.637
When people with AD repeat the same question or story several times, it is helpful to remind them that they are repeating themselves	32.67	0.30	0.101	0.376	0.723
Once people have AD, they are no longer capable of making informed decisions about their own care	33.67	0.31	0.174	0.343	0.732
Eventually, a person with AD will need 24-hr supervision	70.17	0.65	0.366	0.640	0.650
Having high cholesterol may increase a person's risk of developing AD	52.67	0.49	0.244	0.532	0.684
Tremor or shaking of the hands or arms is a common symptom in people with AD	53.33	0.50	0.262	0.480	0.700
Symptoms of severe depression can be mistaken for symptoms of AD	60.17	0.56	0.267	0.516	0.689
AD is one type of dementia	74.83	0.70	0.343	0.601	0.661
Trouble handling money or paying bills is a common early symptom of AD	61.17	0.57	0.267	0.513	0.689
One symptom that can occur with AD is believing that other people are stealing one's things	67.50	0.63	0.180	0.491	0.694
When a person has AD, using reminder notes is a crutch that can contribute to decline	52.00	0.48	0.25	0.476	0.701
Prescription drugs that prevent AD are available	55.00	0.51	0.122	0.377	0.729
Having high blood pressure may increase a person's risk of developing AD	48.50	0.45	0.302	0.557	0.676
Genes can only partially account for the development of AD	66.67	0.62	0.395	0.661	0.643
It is safe for people with Alzheimer's disease (AD) to drive, as long as they have a companion in the car at all times	66.83	0.62	0.302	0.551	0.677
AD cannot be cured	64.83	0.60	0.326	0.601	0.662
Most people with AD remember recent events better than things that happened in the past	57.00	0.53	0.319	0.444	0.710

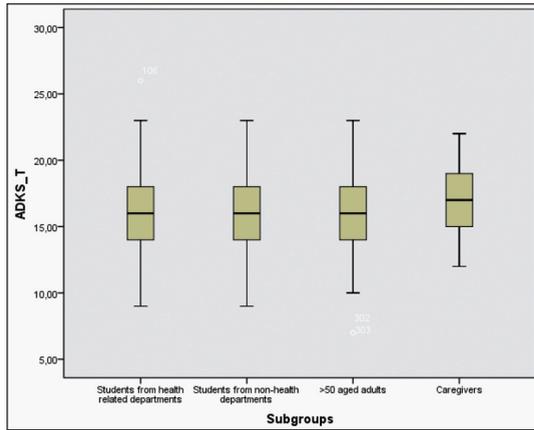


FIGURE 1: Comparison of ADKS-T scores according to subgroups.

that there was a statistically significant difference between the groups ($p < 0.05$). Post-hoc comparisons revealed that the average scores of the non-health students were lower than the average scores of the Alzheimer's caregivers ($p < 0.05$). The mean ADKS scores of the individuals who had a family member with dementia and who were caregivers for dementia individuals were found statistically significantly higher ($p < 0.05$).

RELIABILITY RESULTS

Test-retest reliability: The scale was applied twice to a group of 60 people consisting of 30 students and 30 adults. The age of individuals in the group ranged from 19 to 76 ($M = 40.65$ $SD = 20.12$) and the ADKS-T scores ranged from 15 to 23 ($M = 15.95$, $SS = 2.87$).

The test-retest reliability coefficient of the scale was calculated as 0.81 ($p < 0.001$), and it was determined that there was no statistically significant difference between the scores obtained from the two times ($t = -0.230$ $p = 0.819$).

Internal consistency: Internal consistency of the scale was calculated as 0.74 with Kuder Richardson-20 (Table 1).

Item-total score correlations: The correlation of the items in the scale with the total score was evaluated by the point biserial correlation coefficient and it was determined that it ranged between 0.20 and 0.68 ($M = 0.50$ $SS = 0.10$) (Table 2).

DISCUSSION

This study was conducted to test the validity and reliability of the Turkish version of ADKS to evaluate the knowledge of individuals about Alzheimer's disease. The results of the study showed that the use of ADKS-T in the general population would be valid and reliable. Psychometric results are highly consistent with the results of the study in which the ADKS was developed and the adaptation studies in other languages.^{8,18,21}

It was determined that there was agreement among expert opinions in assessing the content validity of the scale. The average scores of the ADKS-T were compared in terms of sub-groups and dementia experience of the participants for the predictive validity. The comparison results showed that those with dementia experience had a higher average ADKS score. The results of the item analysis showed that the difficulty index and the discrimination index of the items in the scale were sufficient. The test-retest reliability correlation examined in the evaluation of the reliability of the scale was 0,81 and it was shown that the average of the scores calculated in two different time periods was not statistically significant. The Kuder-Richardson-20 coefficient was calculated to be 0.74, which means that the scale is reliable. In addition, correlations of the items with the total score

TABLE 3: Comparison of mean scores of ADKS-T according to participants' dementia experience.

	ADKS-T (Mean±Standard Deviation)	p
Dementia in family members		
Yes	16.71±2.77	0.033*
No	16.07±2.95	
Living with dementia individual		
Yes	16.45±2.82	0.338
No	16.14±2.94	
Experience of caring for dementia individual		
Yes	16.72±2.67	0.019*
No	16.12±2.92	
Attending training/lecture about dementia		
Yes	16.66±2.60	0.618
No	16.16±2.94	

* $p < 0.05$

were also determined above the standard value of 0.20.

Before the adaptation of ADKS to Turkish, it was researched whether it is a tool that can be used to determine the knowledge level of Alzheimer's disease of individuals in Turkey. However, it was not found a tool other than the Turkish version of the Alabama University Alzheimer's Disease Knowledge Test for the health professionals which was used in the study of determining the knowledge level of the Alzheimer's disease of doctors and interns in the Denizli province center by Ergin et al.¹¹ As explained in the introduction section of the study, adequate information about Alzheimer's disease is important not only for health professionals, but also for general population, present and potential formal and informal caregivers of Alzheimer's patients. From this point of view, it is possible to say that ADKS developed by Carpenter et al. and adapted to Turkish in this study is a standard measurement tool that can be used to evaluate the success of studies to increase Alzheimer's knowledge in different groups.

ADKS has been used in many studies in the international literature as a valid and reliable data collection tool in determining the knowledge level of Alzheimer's disease of individuals.^{15,22-25} However, comparing the psychometric results of the Dementia Information Scale, Dementia Information Assessment Tool-2 (DKAT-2), Dementia Information-20 (DK-20) as alternative scales by adapting to Turkish may also be useful.²⁶⁻²⁸

There are some limitations of the study. Since the sample of the study is identified by convenience sampling method, the adaptation of the results to the whole population may lead to misinterpretations. The second criticism of ADKS is the binary response option.²⁶ Answering of scales as "right" or "wrong" can be a limiting factor for individuals who having no idea. It is possible to consider the psychometric prop-

erties of the answer choices of the scale by adding the option "no idea" and comparing the results. Third, the need to update the scale in the direction of improvements in diagnosis and treatment of Alzheimer's disease should be considered. In future studies it may be useful to test the validity and reliability of the Turkish version of ADKS in health and social service professionals. It may also be considered that the discriminant validity of the scale is assessed by a controlled intervention study.

CONCLUSION

The results of the study indicate that ADKS-T is a reliable and valid scale with adequate psychometric properties. Taking into consideration the findings of the study that the knowledge of Alzheimer's disease of the participants is very inadequate, it may be useful to use ADKS-T to assess the knowledge level of Alzheimer's disease in the general population and to guide the development and evaluation of training programs on Alzheimer's disease.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Fikriye Yılmaz, Meriç Yavuz Çolak; **Design:** Fikriye Yılmaz; **Control/Supervision:** Meriç Yavuz Çolak; **Data Collection and/or Processing:** Fikriye Yılmaz, Meriç Yavuz Çolak; **Analysis and/or Interpretation:** Fikriye Yılmaz, Meriç Yavuz Çolak; **Literature Review:** Fikriye Yılmaz; **Writing the Article:** Fikriye Yılmaz; **Critical Review:** Meriç Yavuz Çolak.

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