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Original Article

Turkish Validity and Reliability Study of Partners in Health Scale for Older Adults in Geriatric Patients

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SUMMARY

Background: Effective measurement tools are needed to evaluate the self-management knowledge and behaviors of seniors. We aimed to conduct a validity and reliability study of the Partners in Health Scale for Older Adults (PIH-OA) scale, which is a measurement tool for elderly regarding the consequences of aging over time.
Methods: This study is a methodological type study including 293 individuals over age 65 who applied to Eskisehir Osmangazi University Hospital between March 1 and October 31, 2024. Data were collected using the sociodemographic data form, PIH-OA scale and Older People's Quality of Life – Brief scale (OPQOL–brief). Explanatory and confirmatory factor analysis were performed. Test-retest method, Cronbach alpha reliability coefficient and item total score analysis were used in reliability analysis.
Results: The three-factor and eight-item structure of the PIH-OA scale, including "Knowledge", "Management" and "Coping", is highly reliable (Cronbach's alphas range from 0.606 to 0.787). As a result of test-retests, a positive significant relationship was found between the measurements (r = 0.995). PIH-OA scale and the OPQOL-brief scale, a moderate correlation was found with "Knowledge" and "Management" (r = .430 and r = .413) and a strong correlation was found with "Total PIH-OA scale" and "Coping" (r = .738 and r = .756).
Conclusion: The PIH-OA scale is reliable and valid for assessing the self-management knowledge and behavior of geriatric individuals in the Turkish society.

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1. Introduction

Aging is a normal physiological process in which individuals losing gradually their physical and mental strength. In addition to individual differences and hereditary factors, lifestyle, work, diet, chronic diseases, and mental health also affect aging.[1,2]

Self-care is becoming important due to the loss of physical and mental functions and inadequacy in performing daily functions. Self-care also provides additional benefits in recognizing and evaluating disease symptoms.[3] Effective self-management enables older people to communicate accurately with healthcare professionals about their complaints and problems, which can lead them to have more effective and personalized healthcare. Reliable and valid scales are important to evaluate the level of self-management.[4,5] Self-management measurement tools are effective instruments to assess the status of the elderly individual and their follow-up over time.

The elderly population, which is the population aged 65 and over, in Turkey increased to 10.2% in 2023. While the number of elderly people living alone is so high, the basic needs of these individuals, such as self-care and self-sufficiency, are also gaining importance. According to the American Geriatrics Society, 40% of individuals between the ages of 65 and 75 were inadequate in basic daily living activities.[6]

Partners in Health Scale for Older Adults (PIH-OA) evaluates the self-management knowledge and behaviors of all elderly people living in the community regarding the consequences of aging.[7] The study aims to determine the validity and reliability of the PIH-OA scale, a measurement tool for measuring the self-management knowledge and behaviors of older individuals in Turkish society regarding the consequences of aging over time. In addition, it was aimed to evaluate the correlation of the PIH-OA scale, which we will conduct the Turkish validity and reliability, with the Older People's Quality of Life – Brief scale (OPQOL-brief).[8]

2. Methods

2.1. Study sample

Our study is a methodological study conducted with volunteer participants who are over the age of 65. With the face-to-face interview method, volunteer individuals who were fully oriented to the place, time and person and who followed verbal instructions without support from their companions were included in the study. The study was conducted between March 1, 2024 and October 31, 2024 at the Eskisehir Osmangazi University Health Practice and Research Hospital Family Medicine Polyclinic. In validity and reliability studies, the sample size should be five times or more than the number of

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items in the scale.[9] Therefore, it was calculated that at least 40 patients should be included in the research sample in order to conduct the validity and reliability study of the PIH-OA scale consisting of 8 items. Preliminary analyses were performed after the data number reached the minimum sample size and the data collection process was repeated after the revision. Our study included 293 patients over the age of 65 who were treated and followed up in the outpatient clinic. Those who were not oriented to place, time and person, with serious chronic diseases (malignancy, acute myocardial infarction, acute cerebrovascular accident), acute infection, speech and hearing difficulties, cerebrovascular accident sequelae and amputees were excluded.

2.2. Data collection tools

2.2.1. Sociodemographic Data Form

Form included questions about the patients' age, gender, education level, marital status, disability status, occupation, whether they live alone, income status, smoking and alcohol use, height and weight measurement values, exercise status, vaccination information, presence of chronic disease and continuous medication use.

2.2.2. The Partners in Health Scale for Older Adults (PIH-OA)

Developed by Veldman and colleagues in 2017, the PIH-OA consists of eight items and has three subscales called "Knowledge", "Management" and "Coping". The minimum response on the scale is zero and the maximum is eight, and as the score increases, self-management knowledge and behavior increase. Scale items are scored from zero to eight. The scale contains 8 items in total, total scores are min 0 and max 64. The Knowledge subscale contains 2 items, a total score of min 0 and max 16. The Management subscale contains 2 items, a total score of min 0 and max 16. The Coping subscale contains 4 items, a total score of min 0 and max 32. The Cronbach alpha reliability coefficient of the scale was found to be 0.77-0.84.[7]

2.2.3. Older People's Quality of Life – brief scale (OPQOL-brief)

OPQOL-brief scale was adapted to Turkish by Caliskan et al. and the Cronbach alpha reliability coefficient of the scale was found to be 0.856.[8] There is a preliminary question in the scale that evaluates the general quality of life and is not included in the scoring. This single-item question is coded from "Very good" (5 points) to "Very bad" (1 point). Other questions are rated on a five-point Likert type, ranging from "I strongly agree" (5 points) to "I strongly disagree" (1 point). The scale can be scored between 13–65 points, with higher scores indicating better quality of life.[8]

2.3. Conduction of the study

2.3.1. Language validity

Two experts who were fluent in both languages were selected and the back translation method was used, and all items were translated from English to Turkish. The obtained expressions were compared and discussed, and the best expressions representing the Turkish equivalent were determined. The Turkish text was translated into English again by two different language experts. The translated scale and the original scale items were compared. A preliminary study was conducted to evaluate whether there were any unclear questions and the final version of the scale was revealed in terms of language validity.

2.3.2. Content validity

The Davis technique was used to perform the content validity of the PIH-OA scale.[10] A minimum of three and a maximum of twenty experts are recommended for this technique. In our study, 8 expert opinions were obtained to evaluate the content validity. In the Davis technique, expert opinions are graded 4 for each item as (A) "The item represents the feature", (B) "The item needs some correction", (C) "The item needs a lot of correction", (D) "The item does not represent the feature". In line with the responses of a total of 8 experts to the items, while calculating the content validity index (CVI), the ratio of the number of experts who marked options A and B to the total number of experts was examined. A content validity index value greater than 0.80 is sufficient for item content validity.

A preliminary study was conducted with 20 individuals over the age of 65 to determine whether there were any questions that were not understood in the translated version of the scale and to determine possible problems that may be encountered during the application.

2.3.3. Construct validity

At this stage, explanatory factor analysis (EFA) and confirmatory factor analysis (CFA) were used to check the suitability of the construct validity. Kaiser Meyer-Olkin and Bartlett Sphericity Tests were performed to measure sample adequacy before explanatory factor analysis. CFA was carried out using the Jamovi program.[11]

In the original study, Items 1, 2 were in the "Knowledge" subgroup, while in the preliminary analysis of our study, Items 1, 2, 8 were in the "Knowledge" subgroup. Therefore, after the preliminary analysis, the expression of Item eight was changed to "In general, I am able to live healthily (for example not smoking, healthy eating or regular exercise)".

2.3.4. Reliability of the scale

Reliability is the consistency or repeatability of measurements obtained by applying a scale to a certain group. It is the fact that the measured feature does not change and this stability is shown in cases where measurements are repeated.[12] Item total score analysis and Cronbach's alpha coefficient were used to evaluate the internal consistency of the scale. The scale test-retest method was used to determine whether the scale was a consistent tool over time. The scale was applied to 20 patients selected from the sample at 2-week intervals.

2.4. Ethical approval

The validity and reliability of the PIH-OA scale developed by Veldman K. was investigated by contacting the responsible author who developed the original form and requesting written permission. Data collection in this study was carried out after receiving approval from the Eskisehir Osmangazi University Non-Interventional Clinical Research Ethics Committee dated February 27, 2024 and numbered 54. The Informed Consent Form was filled out and approved by the participants. The principles of the Declaration of Helsinki were followed in the research.

2.5. Statistical analysis

SPSS 25.0 program was used in the analysis of the data. Categorical data were defined with frequency and percentage, continuous data were defined with mean and standard deviation. Content Validity Rate and Content Validity Index were used for the content validity of the scale. EFA and CFA were used to evaluate the construct validity.

Sample adequacy and size were checked with Kaiser Meyer-Olkin and Bartlett Sphericity Test. Scale loadings were calculated with CFA and Path diagram was made using Jamovi program. In the reliability analysis, test-retest method was used to test the invariance against time, Cronbach alpha reliability coefficient was used to measure internal consistency and item total score analysis was used to evaluate whether the items measured the same feature. In the test-retest method, t test was used in dependent groups and the relationship between two groups was examined using Pearson correlation analysis. Mann-Whitney U and Kruskal Wallis tests were used to evaluate group variables. The correlation between the PIH-OA scale and the OPQOL-brief scale was analyzed using Spearman's rank correlation test.

3. Results

The study group consisted of 55.3% female and 44.7% male. In our study, age ranged from 65 to 92, with an average of 70.84 ± 5.82 years. The elderly living with their spouses or relatives were 87.0%. The smoking rate in the elderly was 24.6% and the alcohol use rate was 18.1%. Chronic disease was present in 86.7% of the study group. The mean PIH-OA scale score in the study was 44.35 ± 11.51, min 12 and max 64. In the study, the mean score of the OPQOL-brief scale was 52.13 ± 8.77, min 30 and max 65.

3.1. Content validity of PIH-OA scale

After completing the language validity of the scale, the Davis technique was used to establish the content validity. The content validity rates and content validity index of the scale, calculated by taking the opinions of eight experts, were found to be 1.0.

3.2. Construct validity of PIH-OA scale

The Kaiser Meyer-Olkin test was used to evaluate sample adequacy and the Bartlett Sphericity Test was used to evaluate the relationship between variables. Sample measurement adequacy was found to be good (KMO = 0.750). Bartlett's Test of Sphericity was found to be significant (x^2 = 665.377; p < 0.001), as shown in Table 1.

The Varimax rotation method, which is the most commonly used orthogonal rotation technique, was used during the EFA of the scale. The values related to the items in the explanatory factor analysis as shown in Table 2.

The breaking points of the scale are given in the Scree Plot graph (Figure 1). It was seen that there are 3 breaking points of the factors and the eigenvalue of the first factor is higher.

CFA was applied to show the validity of the dimensions obtained as a result of EFA. CFA was performed with Jamovi program.[13] In the CFA results, the goodness of fit values (RMSEA = 0.159; GFI = 0.908; TLI = 0.679) showed good fit and were found to be statistically significant (p < 0.001). The path diagram showing the CFA results is presented in Figure 2.

Table 1
Result of construct analysis.

KMO and Bartlett's Test	
KMO measure of sampling adequacy	0.750
Bartlett's Test of sphericity	
Approx. Chi-Square	665.377
df	28
Significance	**.000**

KMO: Kaiser - Meyer - Olkin test.

Table 2
Items taken from the PIH-OA scale and results of EFA.

	Knowledge	Management	Coping
Item-1	**.848**	.243	-.012
Item-2	**.798**	-.045	.301
Item-3	.111	**.853**	.070
Item-4	.054	**.779**	.208
Item-5	.147	.178	**.761**
Item-6	.133	.028	**.887**
Item-7	.063	.210	**.844**
Item-8	.328	.382	**.401**

EFA: explanatory factor analysis; PIH-OA: partners in health older adults.

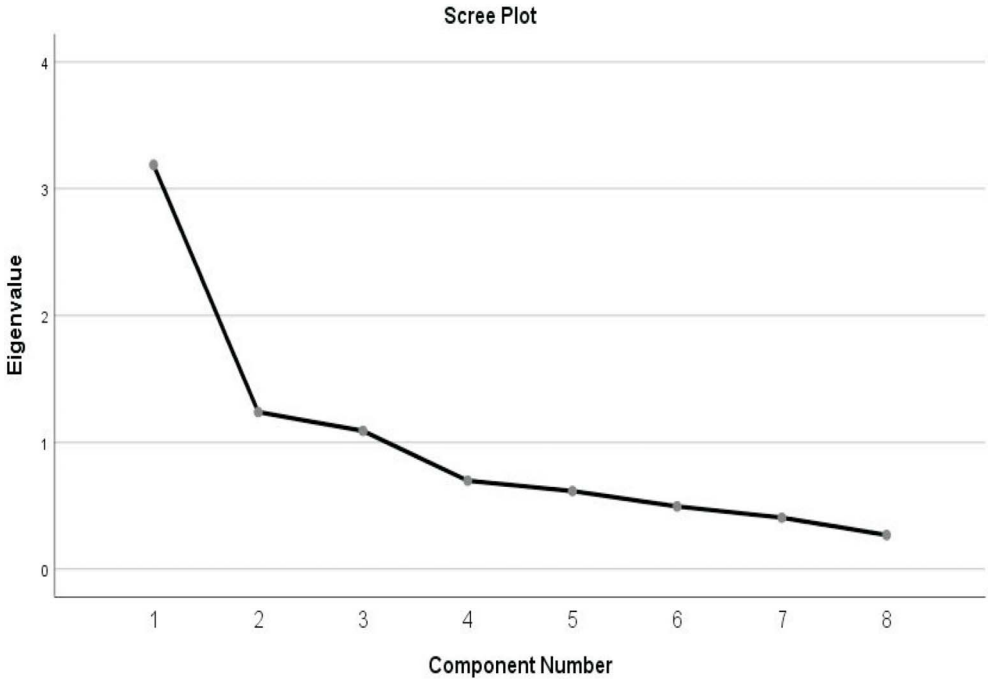


Figure 1. Scree plot graph of PIH-OA scale.

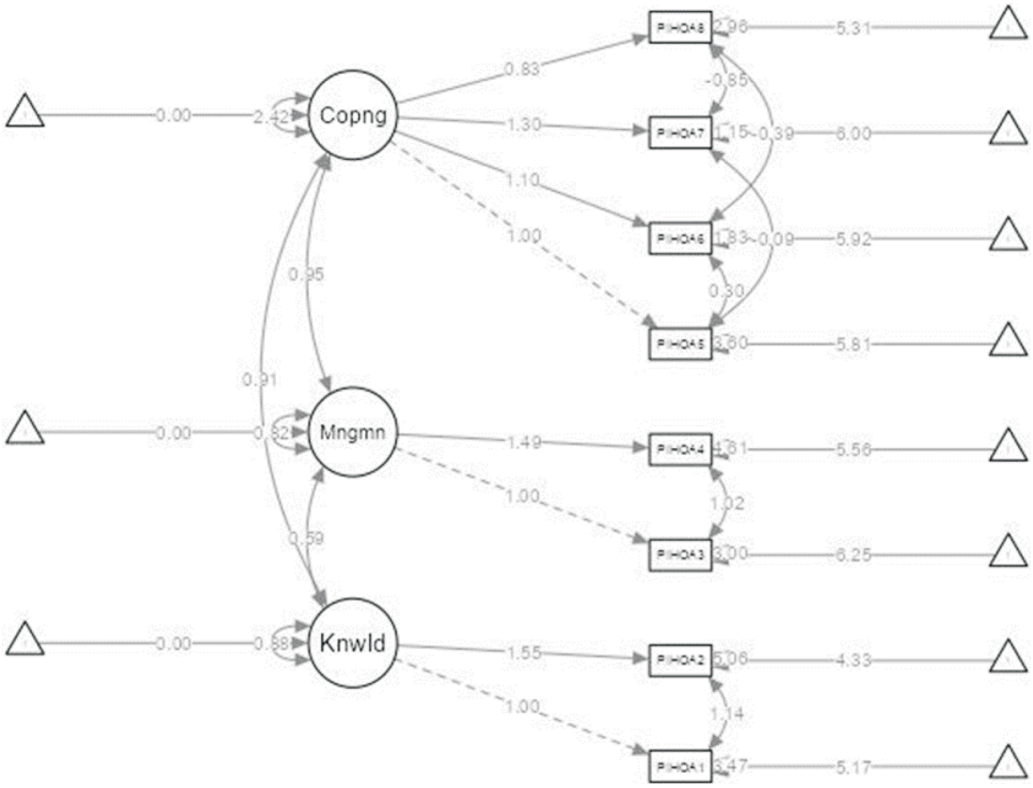


Figure 2. Path graph of PIH-OA scale items.

3.3. Reliability study of PIH-OA scale

In the reliability analysis of the study, the test-retest method was used to assess stability over time. Cronbach alpha reliability coefficient was used to measure internal consistency. Item total score analysis was used to evaluate the items measured with the same feature.

In our study, Cronbach alpha coefficient of PIH-OA Scale was calculated as 0.776 for a total of 8 items, 0.606 for Knowledge, 0.609 for Management and 0.787 for Coping. The values were found to be quite reliable (Table 3).

Table 3
Reliability coefficients of the total group and subgroups of PIH-OA scale.

	Items	Possible scale scores	Observed scale scores	Cronbach Alpha
Total	8	0–64	12–64	.776
Knowledge	2	0–16	0–16	.606
Management	2	0–16	0–16	.609
Coping	4	0–32	0–32	.787

3.4. Invariance of the PIH-OA scale over time

In the analysis results of t-test in dependent groups with the total score in the test-retests applied to the scale, there was no statistically significant difference ($p > 0.05$) and a positive significant relationship was found between the two measurements with Pearson correlation analysis ($r = 0.995$) (Tables 4 and 5).

Table 4
Comparison of test-retest scores averages.

PIH-OA	n	Mean ± SD	Test value; t
Test	20	42.45 ± 12.75	0.175; 0.863
Retest	20	42.40 ± 12.44	

Table 5
Correlation test results between test-retest total scores.

PIH-OA	n	r	p
Test-retest	20	0.995	< 0.001

3.5. Convergent validity

When we examined the correlation between the total and subgroups of the PIH-OA scale and the OPQOL-brief scale, a moderate correlation was found with “Knowledge” and “Management” ($r = .430$ and $r = .413$, respectively) and a strong correlation was found with “Total PIH-OA scale” and “Coping” ($r = .738$ and $r = .756$, respectively) (Table 6).

Table 6
Convergent validity of PIH-OA total scale and subscales.

	Median (Interquartile range)	Total PIH-OA scale	PIH-OA subscales		
			Knowledge	Management	Coping
OPQOL - brief scale	46.0 (37.0–53.5)	0.738*	0.430*	0.413*	0.756*

Spearman’s rank order correlations (0.00–0.29 weak; 0.30–0.69 moderate; 0.70–1.00 strong). * $p < 0.001$.
OPQOL: older people’s quality of life.

3.6. Evaluation of group variables

In the study group, women had higher "Management" scores, married people had higher "Total", "Knowledge" and "Coping" scores, retired people had lower "Management" scores. It was found that all scores were higher in those aged 65–70, those with high school and above education, those with higher income than expenses, and those who exercised more than 4 days a week. It was found that the "Total" and "Coping" scores were lower in smokers, and that the "Knowledge" and "Coping" scores were lower in those with chronic diseases and those who constantly used medication. "Total", "Knowledge" and "Coping" scores were found to be significantly lower in alcohol users ($p < 0.05$).

4. Discussion

This validity and reliability study showed that the PIH-OA scale is an assessment tool for all geriatric people in the Turkish population. Reliability was assessed by performing Cronbach's alpha coefficient and test-retest analysis in the total and subgroups of the scale.

In the Turkish version, the eighth item, "moderate alcohol consumption", was removed. Because the eighth item was found in the "Knowledge" subgroup in the factor analysis conducted after the minimum sample size was reached. When we re-evaluated the item, we thought that this was due to the demographic structure specific to Turkish society. After this change, a similar subgroup fit was obtained with the original PIH-OA in the Dutch society.

Unlike the original PIH-OA scale, content validity was performed to determine how much the items reflect the self-management knowledge and behaviors of the elderly in Turkish society after translation. In this way, the comprehensibility of the questions by Turkish geriatric patients increased.

Test-retest was not applied in the original PIH-OA scale, which is recommended for future studies. In this study, we also applied test-retest. As a result, the stability of the scale over time in the Turkish version was determined.

Self-management efforts with geriatric patients are often disease-specific. Such condition is not appropriate for the management of individuals with multiple comorbidities.[14,15] The PIH-OA scale is suitable for patients with comorbid diseases. In our Turkish version results, Knowledge and Coping scores were low in patients with chronic diseases and those using regular medications. Successful management of comorbid diseases requires patients to develop a comprehensive understanding and self-management behaviors.[16] The diseases impair the quality of life of patients with chronic diseases and who constantly use medication. Also, polypharmacy and the need for continuity of treatment negatively affect treatment compliance.[17] This process makes it even more difficult for the elderly to cope with problems related to self-management.

The "Management" score was found to be high in women. Studies have shown that men are less able to provide self-care and need to live in nursing homes.[18] In our study, high scores were obtained in all subgroups in those with a high school or higher education level. Similar to our study, individuals with higher education levels reported better self-management knowledge and behavior in the original scale.[7]

It has been found that those who exercise 4 or more days per week have good self-management knowledge and behaviors. A study evaluating the quality of life and well-being with physical activity, has shown that the intervention group, which was included in the physical activity program 3 days per week, received higher scores than the control group.[19]

It has been observed that the level of knowledge about aging is low in alcohol users and that it is more difficult to cope with the consequences of aging. Alcohol use can also cause difficulties in coping with the consequences of aging in different societies due to its addictive effect.[7]

According to a review conducted to examine the scales addressing self-management and self-care skills in geriatric patients, it was stated that the PIH-OA scale was the most comprehensive tool among the content categories.[20]

One of the most important points of the PIH-OA scale is that it can be used in all geriatric individuals, regardless of their health status. The scale is suitable for use in large populations. The basis of the scale is the ability to cope with the consequences of aging. The increasing elderly population also causes an increase in comorbid diseases. In the clinic, their independence in coping with both the symptoms of aging and comorbid diseases affects the treatment's success.

Measuring scales appear to be a more practical and effective method for managing the burden of the disease and providing self-care to the elderly. With the application of such scale, self-management behaviors in the elderly will be monitored and personalized support will be provided for them to live an independent life. It is advantageous for all elderly people to use it regardless of their health status.

The limitation of our study is that it was conducted in a single center and mental status was not assessed with an objective scale. The study can be conducted in larger populations by including individuals from rural areas.

5. Conclusions

The PIH-OA scale, which was developed to assess the self-management knowledge and behaviors of all older adults and the consequences of aging, was conducted in Turkish society. The PIH-OA scale is appropriate for use as a valid and reliable scale in geriatric individuals in Turkish society with the revised version of Item 8 consisting of 8 items and 3 sub-dimensions.

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