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RESEARCH METHODOLOGY PAPER

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Validity and reliability of the Turkish version of Geriatric Health Promotion scale

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Abstract

Background: A measure for healthy lifestyle behaviours of older adults would enable the development of effective and target-based health promotion strategies.

Aim: This study aimed to test the validity and reliability of the Turkish version of Geriatric Health Promotion scale among older people in Turkey.

Design: This was a methodological study that was conducted between June and August 2018.

Methods: A total of 321 volunteer older individuals, who were admitted to local health centres, participated in this study. A questionnaire, including sociodemo graphic data form, and the Geriatric Health Promotion scale were used to collect data. Content and construct validity was established using validity analyses.

Results: The reliability of the scale was confirmed by its internal consistency (α = .82) and test-retest reliability (0.86). Exploratory factor analysis for the six-factor construct explained 64.7% of the total variance. Factor loads of each item ranged from 0.44 and 0.91. Confirmatory factor analysis indicated that the theoretical constructs had a perfect fit with data obtained. These data establish that the Turkish version of the Geriatric Health Promotion scale was valid and reliable.

Conclusion: The Turkish version of the Geriatric Health Promotion scale is a reliable and valid instrument that can be used in the evaluation of health-promoting behaviours among older individuals.

KEYWORDS

geriatrics, health, promotion, reliability, validity

SUMMARY STATEMENT

What is already known about this topic?

- The population is ageing rapidly and consistently worldwide.
- Health-promoting behaviours are crucial in enabling older adults to function independently and to ensure a better quality of life.
- The instruments commonly used to measure health-promoting behaviours are not tailored to the specific needs of the older people.

What this paper adds?

- The Turkish version of the GHP scale is usable for evaluating health-promoting behaviours in older adults.
- The Turkish version of the GHP scale for older people showed statistically acceptable levels of reliability and validity for use in the Turkish population.
- The presence of distinct subscales within this scale serves to identify the areas where the older adults require additional support.

The implications of this paper:

- The Turkish version of the GHP scale could be an appropriate instrument for nurses to measure the health-promoting behaviours of older people.
- This scale can be used to establish health promotion programmes that encourage the adoption of healthy lifestyle practices that are specifically tailored to the needs of older people.
- This scale can be used in future studies that are planned for health promotion among the older individuals.

1 | INTRODUCTION

The population is ageing rapidly and consistently worldwide. According to the data from the United Nations (2019), the world's population has reached 7.7 billion; and 702 million of these individuals (9.1%) are older than 65 years. In 2018, 65 years or older individuals outnumbered the children younger than 5 years globally for the first time in history (United Nations, 2019). In Turkey, 8.7% of the population is composed of individuals aged 65 years and older, and as such, it represents that one of the developing countries currently experiences the ageing shift among its citizens. Estimated projections of the following 20 years predict that Turkey will continue to be predominated by an increasingly older population (TUIK, 2019).

The expansion of the elderly population is likely to be accompanied by declines in physical health, mental well-being, and functional ability (Clark et al., 2012). The older people are more likely to suffer from chronic conditions and multi-morbidities, and their functional capacity is often limited (Golinowska, Groot, Baji, & Pavlova, 2016). Preventing chronic diseases, which could decrease quality of life and independence of the older adults and could become an unsustainable load for health care systems, has become a necessity (Walker & Maltby, 2012).

Unhealthy lifestyle behaviours such as the use of tobacco products, false and unbalanced nutrition, insufficient physical activity, and alcohol use are among the basic risk factors of chronic diseases (Booth, Roberts, & Laye, 2012; Kemppainen, Tossavainen, & Turunen, 2013). The practice of health-promoting behaviours by elderly people has been recognized as an important strategy for increasing functional capacity, preventing the occurrence of chronic diseases, delaying the progression and interactions of diseases, reducing psychological problems, developing social networks, and improving quality of life (Booth et al., 2012; Golinowska et al., 2016; Harooni, Hassanzadeh, & Mostafavi, 2014; Korkmaz-Aslan, 2017). Evidence has shown that health-promoting behaviours such as exercising, quitting smoking, and limiting alcohol consumption can help to inhibit the development of many diseases and prevent the loss of functional capacity, thus improving quality of life and lengthening life expectancy (Booth et al., 2012; Brojeni, Taraghi, & Mousavinasab, 2019; Golinowska et al., 2016). In one study, it was found that the general health status of elderly people who walk regularly and use low-fat and low-salt diet was better (Dehghankar, Shahrokhi, Qolizadeh, Mohammadi, & Nasiri, 2018). In another study, a significant relationship was found between mental health and health-promoting behaviours in elderly adults (Barati, Fathi, Soltanian, & Moeini, 2012).

Despite the potential benefits conferred by healthy living, many older adults are not integrating these behaviours into their daily lives (Zulkowski, 2000). It has been indicated that health-promoting behaviours are not at a desired level, and lifestyle problems are more common in this group (Golinowska et al., 2016). In a study performed with community-dwelling older individuals, only 15% were found to have appropriate health-promoting behaviours (Harooni et al., 2014). The studies, which applied scales in different countries, showed that mean health promotion scores of older adults were at a moderate level (Aung, Maw, & Naing, 2017; Brojeni et al., 2019; Kim, 2009). The results of the study by Korkmaz Aslan, Kartal, Ozen Çınar, and Koştu (2017) showed that older adults in Turkey performed moderate levels of health-promoting behaviours. These results highlighted the need for developing interventions that promote health among older people.

The development and implementation of effective health promotion programmes, which encourage and enable the practice of older individuals, are of great importance (Boggatz & Meinhart, 2017). A more comprehensive and holistic approach to health promotion will enhance the effectiveness of the programmes that target older adults (Wang, Lee, Chang, Jane, & Chen, 2015). Health-promoting interventions should be created by taking older adults' needs into account. A significant part of nursing practices is composed of health protection and promotion. In the literature, nurses have been indicated to be the pioneers of health-promoting interventions. Currently, nurses are getting more involved in health promotion and disease prevention programmes that aim to maintain or promote daily functions of the elderly (Marcus-Varwijk et al., 2019). Therefore, nurses should primarily identify health-promoting behaviours existing in the elderly in order to improve effective and elderly-specific health-promoting interventions.

The healthy lifestyle practices of older individuals are likely to be evaluated most accurately with instruments developed for their stages in life. Previous studies on this subject were generally found to use Health Promotion Lifestyle Profile 2, which was developed by Walker, Sechrist, and Pender (1987) and revised again in 1995 (Aung et al., 2017; Brojeni et al., 2019; Harooni et al., 2014; Korkmaz Aslan et al., 2017). However, the instruments used to measure health-promoting behaviours in the majority of these studies were not tailored to reflect the later stages of life. Since these assessment tools were not developed specifically for the elderly population, they were more difficult for older individuals to understand, and their applicability and use were hindered by their inability to capture relevant information.

To our knowledge, there are only two current instruments that were developed to address healthy ageing (Cyarto, Dow, Vrantsidis, & Meyer, 2013). One of them is The Healthy Ageing Quiz, which was developed by Cyarto et al. (2013). The other is Geriatric Health Promotion (GHP) scale developed by Wang et al. (2015). Among these two scales, “Healthy Ageing Quiz” is used on both elderly and middle-age adults, whereas the GHP scale specifically evaluates healthy

lifestyle behaviours among the older people. The Healthy Ageing Quiz consists of 22 items. The scale consists of four subdimensions including activity, nutrition and weight, social support, and optimism (Cyarto et al., 2013). The GHP scale consists of six subdimensions such as healthy habit, community participation, health responsibility, healthy diet, regular exercise, and oral health (Wang et al., 2015). Moreover, this scale is well suited to evaluate health-promoting behaviours of community-dwelling older individuals. The data obtained using the GHP scale help health care providers to understand the lifestyles of older individuals and to plan effective health promotion strategies. Furthermore, the presence of distinct subscales within this assessment tool serves to identify the areas in which older adults require additional support. Taken together, this information will support the development and implementation of effective and target-based health promotion strategies (Wang et al., 2015). In this study, the GHP scale was preferred since it can be understood easily, includes all healthy lifestyle behaviours, can be implemented by the elderly easily, and is recently developed.

No instrument exists to evaluate the health-promoting behaviours of the older individuals in Turkey. There is a need for a valid and reliable scale that is developed specifically to identify health-promoting behaviours of the older individuals accurately in Turkey. Therefore, the present study describes the generation of the Turkish version of the GHP scale originally (Wang et al., 2015) and uses an extensive statistical analysis to establish its valid and reliable application to the older citizens in Turkey. The validity and reliability of the GHP scale have not been tested in different countries yet. For that reason, it is considered that the results of this study will contribute to the international and national literature. With the use of this scale, nurses can describe health-promoting behaviours of the older adults, and appropriate nursing interventions could be developed for the elderly to promote their behaviours.

2 | METHODS

2.1 | Aim

This study aimed to test the validity and reliability of the Turkish version of the GHP scale among older adults in Turkey.

2.2 | Study design

This was a methodological study.

2.3 | Sample and setting

The study was conducted in five family health centres located in Denizli city centre. Family health centres provide primary health care to all age groups, including older adults. Five family health centres were selected by random sampling method among 48 family health centres within the boundary of Denizli. The random numbers table was used to select these five centres. The study population was composed of 321 older adults who were selected by convenience sampling from five family health centres in the city of Denizli, Turkey. Validity and reliability studies indicated that participants that were five to 10 times the number of items should serve as a sufficient sample size (Grove, Burns, & Gray, 2013). These criteria were met by the number of participants enrolled in the study (n = 321), as this sample size was greater than 10 times of 22 items in the scale (Grove et al., 2013). The inclusion criteria were as follows: (a) older than 65 years; (b) unaffected by communication and cognitive impairment; (c) literate; and (d) able and willing to provide informed consent.

2.4 | Data collection instruments

A questionnaire form for sociodemographic data and the GHP scale for the elderly were used as data collection instruments. Sociodemographic characteristics were collected by using a form consisting of seven questions. These questions were regarding the age, sex, education level, marital and income status, health insurance, and perceived health status of the participants.

The GHP scale was developed by Wang et al. (2015) to measure health-promoting behaviours among the elderly. The scale was composed of a total of 22 items and six subscales. The subscales were designed to assess the behaviours associated with healthy lifestyle habits (items 1-5), social support (items 6-12), health responsibility (items 13-15), diet (items 16-18), exercise (items 19-20), and oral hygiene (items 21-22). All items included in the scale were positive. Responses were scored by a 4-point Likert-type scale including the following: never (1), sometimes (2), often (3), and always (4). The internal consistency of the scale was high, as reflected by an alpha coefficient reliability value of.87 (range = .64-.94). The correlation coefficient for test-retest reliability was 0.72 (P < .001). The GHP scale scores can range from 22 to 88. In the original study, the total mean score was 62.09, and the individual scores were normally distributed (Wang et al., 2015).

2.5 | Language translation

For the purpose of this study, the GHP scale was translated from English into Turkish by two independent individuals including an English-language expert and a Turkish nursing instructor separately to ensure language validity and comprehensibility. Next, these two translations were combined by three academicians with English-language expertise in a single document. The resulting Turkish version of the scale was then converted back into English by a translator with native fluency in both languages. After the consistency between the original and retranslated scales was confirmed, the original English and final Turkish versions were sent to 10 specialists studying on elderly health, who evaluated the suitability of the translation. Revisions were made

according to the feedbacks of the reviewers, and the final Turkish-language version of the GHP scale was thereby generated.

2.6 | Pilot study

A pilot study was performed with 15 elderly individuals with the translated Turkish version of the GHP scale. Results showed that the questions were understandable for these older individuals. The subjects and data of this pilot study were not included in the actual study.

2.7 | Data collection

Data were collected from elderly individuals who admitted to the family health centres between June and August 2018 and who agreed to participate in the study verbally during a face-to-face interview. Participation in the study (ie, data collection) required an average of 15 minutes.

2.8 | Ethical considerations

A consent was obtained from Jeng Wang, who is the corresponding author of the original scale, by email, and then, the original scale was translated into Turkish. The Ethics Committee of Pamukkale University Faculty of Medicine approved the study protocol prior to the enrolment of the participants (approval no. 60116787-020/15072). Written permission was received from Denizli Provincial Health Directorate and the family health centres. Written informed consent was obtained from each subject after a thorough and clear explanation of the study prior to the enrolment. All procedures were performed in accordance with the Declaration of Helsinki.

2.9 | Data analysis

The data were analysed by IBM Predictive Analytics SoftWare (PASW) Statistical Product and Service Solutions (SPSS, Chicago, IL, USA) version 21 and the LISREL 8.7 program (Scientific Software International, Inc., Lincolnwood, IL, USA). Sociodemographic characteristics were represented by the numbers and percentages. There are no missing data in the study. Whether the scale showed normal distribution or not was analysed by Kolmogorov-Smirnov test. According to the Kolmogorov-Smirnov test, the scale was not normally distributed ($P < .014$). Content validity index (CVI) was calculated to assess the content validity of the scale. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed on the collected data. The results of the Kaiser-Meyer-Olkin (KMO) test, Bartlett test of sphericity, and the "varimax" rotation technique were examined using EFA (Büyüköztürk, 2014; Field, 2018). In the CFA, statistical methods including the chi-square goodness of fit, chi-square value/degrees of freedom (df), root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), Tucker-Lewis index (TLI), and comparative fit index (CFI) were used to analyse and evaluate the accuracy of the model (Teo, 2013). Additionally, reliability and internal consistency of the scale were confirmed by using the Cronbach alpha reliability coefficient and test-retest reliability intraclass correlation coefficient (ICC) scores, respectively (Streiner, Norman, & Cairney, 2015).

3 | RESULTS

3.1 | Sample characteristics

The mean age of the study participants was 69.99 ± 2.33 years. More than half (57.6%) of the older individuals were women; 71.3% were married; and the majority (70.7%) were elementary school graduates. Of the elderly, 89.4% had a health insurance, and 85.7% had a regular monthly income. Among all, 42.3% perceived their health states as "good," and 57.7% perceived their health states as "poor."

3.2 | Reliability analysis

3.2.1 | Scale's internal consistency reliability and Cronbach alpha reliability coefficient

Item analysis was performed on the GHP scale, and the results were presented in Table 1. The total correlation coefficients for the scale items were between 0.18 and 0.52. The internal consistency of the scale was reflected by the Cronbach alpha values of its 22 items. The total scale had a high internal consistency ($\alpha = .82$), with alpha coefficients for the six subscales ranging from.60 to.91 (Table 2).

3.2.2 | Stability

The stability of the scale was established by measuring the test-retest reliability. For the test-retest analysis, the first 30 older individuals, who were interviewed in the study population, were included. One month later, the scale was applied again to these elderly individuals. Then, the test-retest reliability could be calculated by means of the ICC. ICC between the 30 paired responses was found to be 0.86 ($P = .001$), which was indicative of a high correlation.

3.3 | Validity analysis

3.3.1 | Content validity

In order to assess the content validity of the Turkish version of the GHP scale (Data S1 in the Supporting Information), the opinions of 10 teaching staff, who specialized in public health nursing, were queried. These specialists evaluated each item for its distinctiveness, understandability, and appropriateness for the purpose. Based on the

TABLE 1 Item analysis internal consistency of the Geriatric Health Promotion scale

Items	Mean	SD	Corrected Item Total Correlation	If Item Deleted α
1. I have breakfast every day	3.66	0.64	0.30	.82
2. I eat three times a day	3.11	0.92	0.24	.82
3. I sleep sufficiently	3.23	0.90	0.30	.82
4. I wear well-fit shoes	3.46	0.77	0.38	.81
5. I wear nonslippery shoes	3.22	0.96	0.40	.81
6. I know leading people of the neighbourhood (eg, reeve)	3.42	0.85	0.26	.82
7. I communicate with my friends	3.40	0.78	0.43	.81
8. I participate in personal trainer-guided exercise programmes or activities	1.49	0. 77	0.42	.82
9. I participate in public programmes (eg, trekking, swimming, pilates, and yoga)	1.58	0.79	0.34	.82
10. I participate in health-related education programmes	1.56	0.76	0.30	.82
11. I participate in the activities at my neighbourhood (such as wedding and friend meetings)	2.91	0.93	0.31	.82
12. I participate in religious and cultural activities (regularly going to the mosque, reading Quran at home, etc)	2.77	1.04	0.18	.82
13. I check my blood cholesterol level once a year	2.81	1.05	0.40	.81
14. I check my blood pressure (tension) once a year	3.09	0.96	0.42	.81
15. I check my blood glucose once a year	3.02	1.03	0.33	.81
16. I have a balanced diet including six foods groups (bread, meat, milk, fruits, vegetables)	3.06	0.91	0.52	.80
17. I consume 1.5 portions (bowlful) of vegetables a day	2.85	0.91	0.51	.80
18. I eat two fruits of fist size a day	3.00	0.90	0.50	.80
19. I exercise for 30 min a day	2.01	1.04	0.51	.80
20. I exercise three times a week each lasting for at least 30 min	1.90	1.01	0.52	.80
21. I brush my teeth before sleeping	2.35	1.14	0.45	.81
22. I brush my teeth three times a day	1.82	0.94	0.44	.81

TABLE 2 Cronbach alpha for subscales and total scale

Subscales	Number of Items	Cronbach α
Health habit	5	.64
Community participation	7	.60
Health responsibility	3	.88
Health diet	3	.77
Regular exercises	2	.91
Oral health	2	.82
Total	22	.82

Davis technique, the experts reported for each item as appropriate (1), should be reviewed (2), require critical revision (3), or inappropriate (Davis, 1992). Based on the data generated from surveying expert opinion, the CVI was determined to be 0.99. Changes were made in the statements on the basis of their recommendations, and the scale was given its final form. In the Community Participant subscale, the parenthetical explanation (eg, trekking, swimming, walking, pilates, and yoga) was added to the item as "I participate in community programs (eg: Tai chi, walking, swimming)." In the same manner, the parenthetical phrase (regularly going to the mosque, reading Quran at home, etc) was added to the item "I participate in religious and cultural activities." The statement as "I have 1.5 bowls of vegetables/day" was changed to "I consume 1.5 portions of vegetables a day." The statement as "I participate in township/village activities" was changed into "I participate in the activities around my neighborhood (such as wedding and friend meetings)."

3.3.2 | Construct validity

EFA and CFA were performed on the collected data to determine the construct validity of the scale. Before the factor analyses, the KMO value and the results of Bartlett test were used for the qualification of the sample. The KMO was 0.76, and the results of Bartlett test were 2406.89 with a df = 231 and a significance level of $P = .000$.

The EFA resulted in an eigenvalue of 14.22 for the scale, and the six-factor construct explained 64.7% of the total variance. The correlation values for each item ranged between 0.44 and 0.91 (Table 3).

TABLE 3 Rotated factor loaded valued of the GHP scales

Items	Loading Factor	Variance Explained	Eigenvalue
Factor 1. Health habits			
Item 1	0.67	10.67	2.35
Item 2	0.69		
Item 3	0.67		
Item 4	0.70		
Item 5	0.78		
Factor 2. Community participant			
Item 6	0.54	17.56	3.86
Item 7	0.60		
Item 8	0.81		
Item 9	0.76		
Item 10	0.74		
Item 11	0.70		
Item 12	0.44		
Factor 3. Health responsibility			
Item 13	0.87	11.19	2.46
Item 14	0.87		
Item 15	0.91		
Factor 4. Healthy diet			
Item 16	0.62	9.89	2.18
Item 17	0.80		
Item 18	0.77		
Factor 5. Regular exercises			
Item 19	0.68	7.82	1.72
Item 20	0.71		
Factor 6. Oral health			
Item 21	0.75	7.58	1.66
Item 22	0.76		

Abbreviation: GHP, Geriatric Health Promotion.

To investigate model fitness, goodness-of-fit indices were used. The most widely accepted global fit indices are the chi-square, chi-square value/df, RMSEA, CFI, TLI, and SRMR (Brown, 2015; Teo, 2013). Based on the result of the CFA, goodness-of-fit indices of the scale were found, as follows: chi-square value = 507.14 (df = 194, P = .000), chi-square value/df = 2.614; RMSEA = 0.071; SRMR = 0.085; TLI = 0.91; and CFI = 0.92 (Table 4). Path diagram of the scale is presented in Figure 1.

TABLE 4 Goodness-of-fit indices of the Geriatric Health Promotion scale

Goodness-of-fit indices	
χ^2	507.14, P < .001
χ^2/(df)	507.14: 194 = 2.614
RMSEA, P value	.071 (P < .05)
TLI	0.91
SRMR	0.085
CFI	0.92

Abbreviations: CFI, comparative fit index; RMSEA, root mean square error of approximation; SRMR, standardized root mean square residual; TLI, Tucker-Lewis index.

4 | DISCUSSION

Behaviours, which were proven to promote good general health, also help to prevent chronic diseases and improve the overall quality of life (Bahar, 2013). Furthermore, facilitating healthy aging provides more opportunities for older adults to play an active role within society and to contribute to their community (Montross et al., 2006). The adoption of healthy habits and behaviours was proven to optimize health outcomes in aging populations (Wang et al., 2015). Therefore, it is important to have a metric for assessing health-promoting behaviours among older adults. To our knowledge, no instrument exists to evaluate the older subset of a population that measures health-promoting behaviours specifically. Therefore, this study created and validated an effective and reliable version of the GHP scale for the Turkish population.

In this study, internal consistency, Cronbach alpha, and test-retest analyses were utilized to determine the validity and reliability of the Turkish version of the GHP scale. Item total correlation is a widely used method for checking the homogeneity of a scale made up of several items (Everitt & Skrondal, 2010). Corrected item total correlation coefficients were given in the internal consistency item analysis. Corrected item total correlation coefficients indicate the correlation of an item with the total scale when that item is omitted. In our study, the corrected item total score correlation ranged from 0.18 to 0.52. Literature suggests that values > 0.20 show a good level of correlation (Everitt & Skrondal, 2010; Tavsancil, 2014). Based on the literature data, we can state that item total correlation coefficients of all items except one were at a good level in our study. Any item with a correlation coefficient < 0.20 should be removed from the instrument; however, it is recommended to disregard that item only if the alpha coefficient increases after its removal but not if it decreases or does not change (Everitt & Skrondal, 2010; Field, 2018). In the present study, the total item correlation coefficient of Item 12 (I attend religious and cultural activities) was 0.18 and, thus, below the established cut-off point. The alpha coefficient was recalculated when this item was excluded from the scale, and no change was observed. Therefore, Item 12 was included in the final version of the scale because any item, whose reliability does not change the scale, still supports it.

Another analysis method employed to determine the scale's reliability was the Cronbach alpha coefficient. The total Cronbach alpha coefficient of the overall scale was found to be.82. The Cronbach alpha coefficient values for all the subscales were between .60 to .91. In the study that described the development and validation of the original scale, the total scale had a high internal consistency (α = .87),

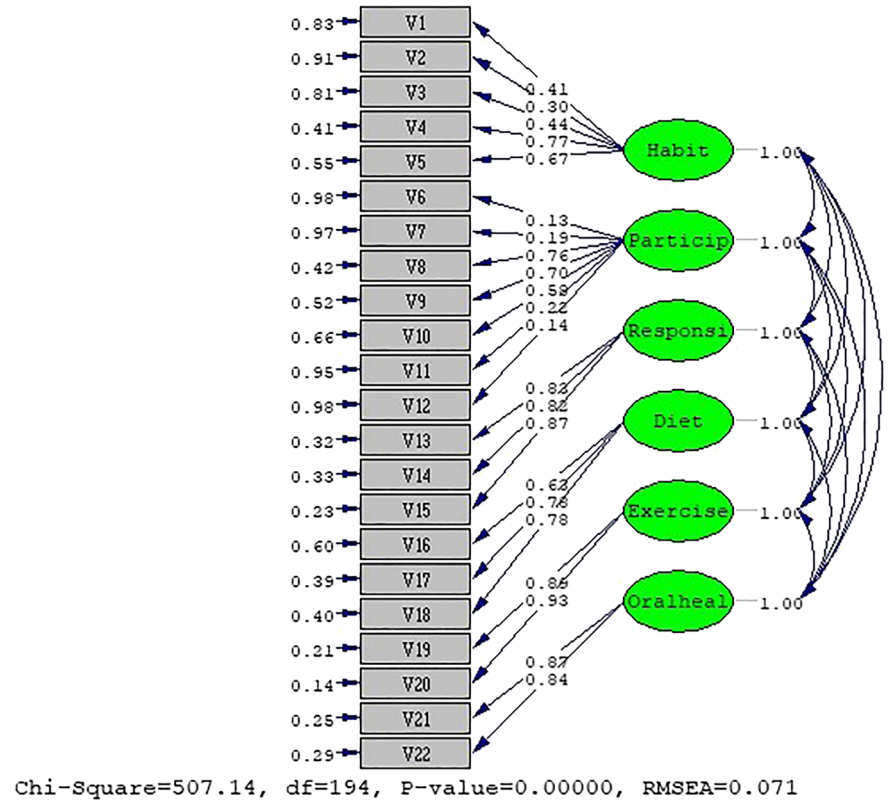

FIGURE 1 Path diagram for the Geriatric Health Promotion scale

with alpha coefficients for the six subscales ranging from.64 to.94 (Wang et al., 2015). Cronbach alpha values of our study were found to be similar with the Cronbach alpha values of the original study. Literature data have shown that measurement instrument is reliable if Cronbach alpha coefficient is smaller than.40, it has a low reliability if the coefficient is between 0.40 and 0.59, it is quite reliable between 0.60 and 0.79, and it is reliable at a high level between 0.80 and 1.00 (Grove et al., 2013). Based on our results, Cronbach alpha coefficient from our study reflected a high level of reliability.

The stability of the scale was established by measuring the test-retest reliability. For scale stability, the test-retest reliability ICC for the total scale was found to be 0.86. In the study by Wang et al. (2015), it was reported that the test-retest correlation coefficient was 0.72 (P < .001). The value obtained for reliability must be >0.75 (Grove & Cipher, 2017). The results of 30 elderly individuals demonstrated a satisfactory test-retest reliability for the overall scale, indicating that the instrument was stable. The test-retest reliability ICC calculated from the data in this study was higher than the original version of the scale. In the original publication, the second round data used in the retest were collected after a 3-month period; however, we only waited 1 month before resampling. Therefore, this shorter time interval could underlie the increased ICC observed in the present study.

The construct validity of the scale factors was evaluated by using exploratory and CFAs. The KMO analysis was used to determine the sampling adequacy for factor analysis. When the KMO value is <0.50, the sample size is not accepted (Büyüköztürk, 2014; Field, 2018). The KMO value from the present study was found to be 0.76, and the result of Bartlett test was 2406.89 (P < .001), which was lower than the results of the original study (KMO = 0.80, Bartlett test = 58 294.32) (Wang et al., 2015). Yet our KMO value still fell within the range deemed acceptable in the literature (Field, 2018), and it was determined that the sample size was adequate for a factor analysis.

EFA was used to assess whether the scale items were clustered into distinct subcategories or remained equally independent. This analysis provided an eigenvalue of 14.23 for the six-factor construct in question. In our study, the six-factor construct explained 64.75% of total variance. In the original study of the scale, this six-factor construct was found to explain 68.95% of total variance (Wang et al., 2015). Higher variance ratios in the factor analysis are indicative of the stronger factor construct (Field, 2018). In the social sciences, variance ratios between 40% and 60% are considered as sufficient. In the literature, the factor structure of the scale was reported to be strengthened as the percentage of explained variance increased (it should be ≥50%) (Alpar, 2014). Therefore, the variance in this study was comparable with the original one and adequate for analysis.

Factor load, which is one of the model parameters, shows whether items fit concept structure or not. Factor load value is a coefficient that explains the relationship between the items and the factors. At the end of analysis, factor loads of each item were found to show a distribution between 0.44 and 0.91. In the study by Wang et al. (2015), factors loads were reported between 0.53 and 0.89. In the literature, the reference value recommended for factor load was reported as 0.40 and above (Alpar, 2014; Grove & Cipher, 2017).

Factor loads obtained in our study were similar to the data of the original study, and besides, they were above the recommended reference values. These results show that factor structure of the Turkish version of the GHP scale fits the factor structure of original scale.

In order to confirm the validity of the factors identified from the EFA, the goodness-of-fit statistics were examined by using a CFA (Teo, 2013). The classical goodness-of-fit model index is chi-square (χ^2). The fit value, which was determined by dividing chi-square coefficient by df, was found to be 2.614, reflecting a good fit. The most widely accepted global fit indices are the RMSEA, CFI, TLI, and SRMR. For each of these fit statistics, values generally range from 0 to 1. For the RMSEA and SRMR, values closer to 0 indicate better model fit, whereas values closer to 1 indicate better model fit for CFI and TLI. Recommendations vary in determining which values of these fit statistics should be considered acceptable (Teo, 2013). Other frequently used tests include RMSEA where the lower limit is close to 0, whereas the upper limit should be <0.08 in a well-fitting model. The EFA resulted in an RMSEA value of 0.071, which is indicative of good fit. It has been suggested that SRMR values, which are equal to or smaller than 0.05, indicate better fit, and values equal to or smaller than 0.08 indicate good fit (Brown, 2015). However, values as high as 0.08 are deemed as acceptable fit. In this study, SRMR value of 0.085 suggested that the fit was acceptable (Cokluk, Sekercioglu, & Buyukozturk, 2014). CFI and TLI values of 0.95 or higher corresponded to a better fit and 0.90 a good fit (Cokluk et al., 2014; Teo, 2013). Accordingly, the CFI and TLI values obtained were >0.90 and confirmed the goodness of fit. Taken together, CFA results demonstrated that the acceptable fit indices were satisfactory (Brown, 2015; Cokluk et al., 2014).

4.1 | Study limitations

This study has some limitations. Since data of the study were collected by using convenience sampling, our results could not be generalized to the public. The period between the initial test and the retesting was short; and sample size was smaller than that of the original study. Moreover, the study population was composed of older individuals who had graduated at least from elementary school, and the majority of them had social insurance; hence, our findings could not accurately represent Turkish citizens who are illiterate and do not have any social insurance. To address these limitations, future studies should use an objective and standardized quantification system to collect data from a more diverse study sample in which all citizen groups are adequately represented.

5 | CONCLUSION

The results of our study confirmed that the scale was valid, reliable, and useful for assessing health-promoting behaviours among the older individuals in Turkey. It is composed of six subscales, which are beneficial for identifying areas that require attention and for determining the strategies that best address these deficits. Nurses can describe existing health-promoting behaviours of the elderly easily by using this scale. Thus, appropriate nursing interventions for the elderly can be planned and implemented in order to improve behaviours where required. The effect of nursing interventions for promoting elderly health on care outcomes could be evaluated through the scale. Moreover, it could be used to establish health promotion programmes and policies for the older individuals in order to reach the goal of healthy and active aging. The findings of the study also support the use of the GHP scale both nationally and internationally. Therefore, it is recommended to conduct validity and reliability studies of the scale on elderly populations in different countries. We recommend the use of the GHP scale for studies that are conducted to evaluate health-promoting behaviours among older people and to inform about specific and effective intervention efforts.

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CONFLICT OF INTEREST

No conflict of interest has been declared by the authors.

AUTHOR CONTRIBUTIONS

AK, GKA, and NK designed the study. AK, AT, and GKA collected the data. AK and NK analysed the data. AK, GKA, NK, and AT prepared the manuscript. All listed authors meet the authorship criteria, and all authors are in agreement with the content of the manuscript.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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