TURKISH PSYCHOLOGICAL COUNSELING AND GUIDANCE JOURNAL
2025, VOL. 15, NO. 78, 516-536

Official Journal of
Turkish Psychological Counseling
and Guidance Association

ISSN: 1302 – 1370, E-ISSN: 2822 – 6569

https://doi.org/10.17066/tpdrd.1533891

RESEARCH ARTICLE

Turkish Validity and Reliability of The Self-Perceived Health Scale: How Do Quality of Life, Psychological Well-Being, and Health Promotion Behaviors Affect Perceived Health in Older Adults?

Banu Aslan[a] Özgür Önal[a]

[a] Süleyman Demirel University, Isparta, Türkiye.

ARTICLE HISTORY

Received: 15/08/2024
Accepted: 29/11/2024

KEYWORDS

Older Adults, Self-Perceived Health, Quality of Life, Psychological Well-Being, Health Promotion Behaviors.

ABSTRACT

The study aims to validate and assess reliability of the Turkish version of a tool for Self-Perceived Health (SPH) in older adults, while exploring its associations with quality of life (QoL), psychological well-being (PWB), and geriatric health promotion (GHP) behaviors. Methods included scree plots, Kaiser-Meyer-Olkin measure, Bartlett's test, variance percentage, and reliability statistics (Cronbach's alpha, Spearman-Brown coefficient, Hotelling's T-squared test, and Bland-Altman plots). Pearson correlation and linear regression analyses were conducted. 1202 participants (mean age: 66.62 ± 6.43 years, 58.9% female) took part. Factor loadings ranged from 0.471 to 0.941, with Cronbach's Alpha measuring at 0.946. Bland-Altman analysis indicated interchangeability between SPH and SF-12. Regression analysis revealed several factors influencing SPH: being male, transitioning to metropolises, employment, improved economic status, non-smoking, alcohol consumption, regular medication use, and the increase in PWB and GHP behaviors. The study confirms the Turkish SPH scale's validity and reliability, shedding light on factors impacting older adults' health perceptions.

Somewhat bad news is that the world population is aging. The World Health Organization (WHO) predicts that the population aged 60 years and older will rise from 12% to 22% between 2015-2050 (WHO, 2022). Aging is a complex process that is not only linked to cellular damage but is also influenced by socioeconomic factors. As individual differences have an important seat in tailoring the perception of aging (WHO, 2022), it may be considered a period that needs to be addressed with its three distinct aspects: physiological (i.e., musculoskeletal system problems, functional loss, falls, disability, chronic conditions, hearing and vision defects), psychological (i.e., future anxiety, hopelessness, anxiety, depression, cognitive retardation), and social (i.e., loss of loved ones, transition from employment to retirement, decline in social status, loneliness) (Ceylan, 2020; Kaptan, 2016; Yildirim & Sahin, 2020). These aspects of aging are significantly related to older adults' perceptions of health. Self-perceived health (SPH) is a complex indicator measuring how one incorporates subjective and objective factors of health into their self-perceptions (Machón et al., 2016) and is often considered for self-assessment of health needs (Antczak & Miszczyńska, 2020; Freidoony et al., 2015). A previous meta-analysis emphasizes that SPH is associated with one's actual health status and that poor SPH doubles mortality risk (Bamia et al., 2017). Besides, determinants of SPH tend to differ by community, and it becomes a strategic factor in setting public health policies (Freidoony et al., 2015). SPH is also highly

CORRESPONDING AUTHOR Banu Aslan, banuaslan@sdu.edu.tr, ORCID: 0000-0003-4715-8449, Süleyman Demirel University, Isparta, Türkiye.

recognized in identifying future healthcare needs and predicting mortality rates and declines with age, according to the Organization for Economic Cooperation and Development (OECD). One's assessment of their health status by focusing on physical and mental health contributes to their life expectancy and quality of life (QoL) (OECD, 2021; Palladino et al., 2016); therefore, it can be asserted that SPH encapsulates one's all health indicators (Gumà, 2021). Moreover, SPH is affected by unmodifiable (e.g., sociodemographic characteristics) and modifiable (e.g., lifestyle) factors. A previous meta-analysis lists protective factors for positive SPH in older adults as male gender, being a young adult, having a high level of education, living with a partner, engaging in physical activities, not being obese, avoiding smoking, being apparently healthy, and being free of disease (Bamia et al., 2017). These protective factors encourage older adults' positive health behaviors and, thus, their tendency to protect their own health. Besides, a healthy lifestyle improves one's QoL and perceived health status. A study on older adults across Europe highlighted a negative association between SPH and QoL (Caramenti & Castiglioni, 2022). Good QoL measured with SF-12 among older Brazilian adults was found to be associated with better PH (de Oliveira et al., 2021). Similarly, QoL was found to be poor in older Malaysian adults with poor PH (Mohamad Fuad et al., 2020); this was also the case between PH assessed with SF-36 and QoL among older Australian adults (Foottit & Anderson, 2012).

One factor that can boost SPH is psychological well-being (PWB). The WHO defines mental well-being not only as the absence of psychological disorders but also as a state of coping with stress, productivity, awareness of one's own abilities, and contributing to community steered by socioeconomic, biological, and environmental factors (WHO, 2024a). It also notes that well-being is about QoL and contributing to the community, which would be possible through the promotion and development of health (WHO, 2024b). In a systematic review, PWB is described as a multifaceted concept with distinct dimensions, including one's overall happiness, life satisfaction, and mental and emotional health. Maintaining a desirable level of PWB is essential for augmenting one's QoL, SPH, and overall enjoyment (Dhanabhakyam & Sarath, 2023). Given the increasing life expectancy and resulting physiological, psychological, and social challenges faced by older adults, public healthcare efforts should be prioritized to improve their QoL and encourage them to engage in necessary endeavors to protect their own health.

Ultimately, the present study attempts to explore the validity and reliability of the Turkish version of a measurement tool designed to assess SPH in Turkish older adults and then investigates the relationships between SPH, QoL, PWB, and health promotion behaviors among older adults, while also aiming to identify the socio-demographic factors that may predict SPH.
Additionally, this study aims to evaluate the interchangeability of the SPH scale with the SF-12 short form, which is considered to share similar characteristics with the subdimensions of SPH related to physical health, psychological health, and healthy lifestyle factors. Therefore, four hypotheses are proposed in our research.

Hypotheses

Hypothesis 1 (H1): The Turkish version of the Self-Perceived Health (SPH) scale demonstrates acceptable validity and reliability among older adults in Türkiye.

Hypothesis 2 (H2): Levels of Psychological Well-Being (PWB) are positively related to Self-Perceived Health (SPH) in older adults.

Hypothesis 3 (H3): An increase in health promotion behaviors has a positive effect on Self-Perceived Health (SPH) among older adults.

Hypothesis 4 (H4): Demographic factors such as gender, employment status, and economic status have a significant impact on Self-Perceived Health (SPH) in older adults.

Method

Research Design

This is a methodological study covering a target population of individuals aged 60 years and older.

Participant and Descriptive Characteristics

Although we initially set our minimum sample size as ten times the number of items of the instrument adapted in this study, we collected data from 1,202 people from seven regions of Türkiye to reach a wider sample and increase the generalizability of our findings. While we included adults aged 60 years and older with the capability of expressing themselves in writing or verbally, those under 60 years, with mental health issues, and with an inability to express themselves were excluded from the study.

A total of 1202 individuals participated in the study. The average age of the participants was 66.62 ± 6.43 years (min-max:60-98), with 58.9% being female. More than half of the participants (51.7%) were primary school graduates, while 62.1% were married. The participants' residential areas were determined as follows: 43.2% in the Mediterranean Region, 19.5% in the Aegean Region, and 59.5% residing in a metropolitan area or city. When examining their employment status, it was found that 85.7% are either not working or retired. Additionally, 19.1% of participants reported not having anyone to support them, while 15.2% indicated poor economic conditions. Evaluation of sleep patterns revealed that 13.6% always had irregular sleep, 59.9% sometimes had irregular sleep, and 26.5% always had regular sleep. The prevalence of smoking among participants was 22.5%, alcohol use was 17.9%, and 4.5% of participants reported never using drugs in their lifetime. It was noted that 87.2% of participants have children, 24.8% live alone, and 82.4% indicate ownership of their residence. The proportion of participants unable to perform daily activities independently was 7.8%, with 48.2% reporting chronic illnesses and 58.2% regularly using medication. The rate of participants with disabilities was 4.4%, while those practicing healthy eating habits constituted 73.6%. In interpersonal relationships, the average score on a 1-5 Likert scale was 3.81 ± 0.79, with a total score of 38.83 ± 9.63 for PWB and 57.86 ± 11.12 for GHP (Table 1).

Table 1. Participants Characteristics

	n	%
Age (years) *M*±*SD*	66.62	±6.43
Gender		
Female	708	58.9
Male	494	41.1
Educational attainment		
Primary school	621	51.7
Secondary school	169	14.1
High school	191	15.9
University	221	18.4
Marital status		
Married	746	62.1
Single-widow-divorced	456	37.9
Settlement region		
Mediterranean Region	519	43.2
Aegean Region	234	19.5
Other Regions	449	37.4
Settlement area		
Metropolitan	391	32.5
Urban area	325	27.0
District	282	23.5
Town	204	17.0
Employment status		
Unemployed or retired	1030	85.7
Employed	172	14.3

Table 1. *(Continued)*

Income status	183	15.2
Poor	726	60.4
Moderate	293	24.4
Good		
Supporting person		
N/A	229	19.1
A couple of people	655	54.5
Many people	318	26.5
Sleep pattern		
Always irregular	164	13.6
Sometimes irregular	720	59.9
Always regular	318	26.5
Smoking		
Yes	271	22.5
Quitted	301	25.0
Never	630	52.4
Alcohol use	215	17.9
Never using drugs in their lifetime	54	4.5
Having children	1048	87.2
Living alone	298	24.8
Homeowner	990	82.4
Inability to perform activities of daily living on one's own	94	7.8
Having chronic disease	579	48.2
Having regular medication	699	58.2
Having a disability	53	4.4
Having a healthy diet pattern	885	73.6
Interpersonal relationships (5-point Likert) *M*±*SD*	3.81	±0.79
Psychological Well-Being (total score)	38.83	±9.63
Geriatric Health Promotion (total score)	57.86	±11.12

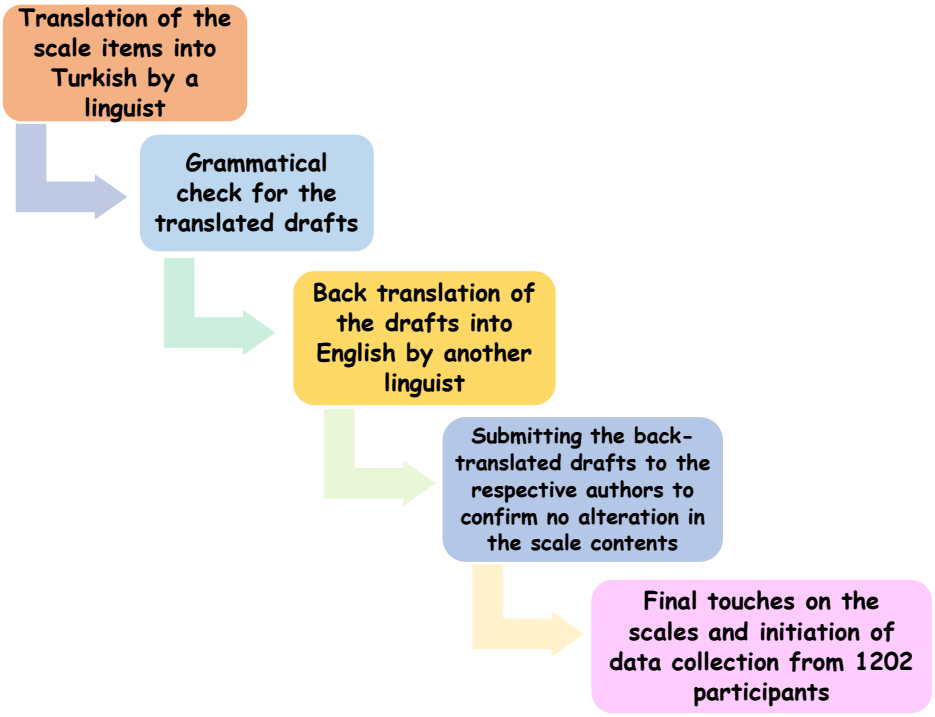
Sampling Adequacy

A sample size of 1,000 or more is usually deemed excellent for augmenting the power of a measurement tool and the generalizability of findings (Comrey & Lee, 1992). While we collected data from a total of 1,202 older adults, this number was 600 in the original study (Tinajero-Chávez et al., 2023). Besides, it is known that the more the factors emerge on a scale, the higher the number of subjects should be recruited (DeVellis, 2017). As a rule of thumb, 5-10 participants per item is recommended (Tinsley & Tinsley, 1987), which was about 100.2 in this study.

Language Validity

A professional linguist initially translated the SPHS items into Turkish. Next, the translated draft went through the linguistic checks by another linguist with an excellent command of Turkish. A different linguist then back-translated the draft into English. The back-translated draft was sent to the corresponding author to ensure the scale content was not altered. After all, we initiated the data collection procedure (Beaton et al., 2000) (Figure 1).

Figure 1. Stages of Language Validity



Ethical Approval

The ethics committee approval has been obtained from the Ethics Committee Presidency of Suleyman Demirel University. Number of meetings: 75, Number of decisions: 22. Furthermore, informed consent was secured from participants prior to data collection, thereby confirming their voluntary participation in the study. We obtained permission from the corresponding author of the SPHS and those adapting the other instruments into Turkish to use their tools to collect data for this study.

Data Collection Procedure

The data collection process was conducted between April 30 and June 1, 2024. During the consent acquisition process, participants were informed that completing the questionnaire would take approximately 15-20 minutes, that no personal information would be requested in the survey, that the responses would be used solely for scientific research purposes, and that questions would be made available for response upon granting consent. Participants were asked sociodemographic questions as well as questions from the Self-Perceived Health Scale (SPHS), the Short Form (SF-12) Health Survey, the Psychological Well-Being Scale (PWBS), and the Geriatric Health Promotion Scale (GHP-scale) via a link created in Google Forms using the snowball sampling method. The initial distribution was carried out through acquaintances living in the seven regions of Türkiye, as well as university students from different regions, who were asked to share the link with their own networks. Each recipient was requested to distribute the link to their contacts via mobile phones and/or social media platforms. This approach allowed us to reach a wide range of participants from various regions.

Self-Perceived Health Scale

The SPHS was designed by Tinajero Chávez et al. (2023) on a sample of 600 Mexicans. The authors initially pooled 50 items but ended up with a 12-item instrument with three subscales: physical health factor (PhyHF), psychological health factor (PsyHF), and healthy lifestyle factor (HLF). The authors concluded moderate correlations between the three subscales. The instrument includes no reverse-coded items, and the SPHS items are rated on a six-point Likert-type scale (1 = disagree, 6 = absolutely agree). The authors suggest three distinct approaches to interpreting the scores. The first is to consider the theoretical mean of scores. In this scoring

technique, as responses for each item vary between 1 and 6 (M = 3.5; minimum = 12 and maximum = 72), scores below and above the mean are accepted as low and high PH, respectively. The second is to obtain standard scores. The authors suggest that each participant's score can uniquely be interpreted using this scoring technique. The final technique is to set cut-off points. PH can be grouped into high, moderate, and low using some distribution points (usually quartiles) of participant scores. In the original study, the SPHS demonstrated measurement invariance by gender and sufficient validity and reliability properties. The authors concluded high internal consistency for the scale by calculating both Cronbach's alpha coefficient (α = 0.933) and McDonald's Omega coefficient (ω = 0.925) (Tinajero-Chávez et al., 2023).

12-Item Short-Form Health Survey (SF-12)

Soylu and Kutuk (2022) adapted the SF-12, developed by Ware et al. in 1995, into Turkish. This 12-item scale subsumes two components. While the Physical Component (PC) Summary includes the general health, physical functionality, role-physical, and bodily pain subscales, the Mental Component (MC) Summary covers the social functionality, role-emotional, mental health, and vitality subscales. The PC and MC (α= 0.73 and 0.72, respectively) were concluded to be robustly correlated with the components of the SF-36. Moreover, the Turkish version of the scale was found to be valid and reliable for measuring one's general health and QoL. One may obtain a total score of 0-100 on the scale, and higher scores indicate better health (Soylu & Kutuk, 2022).

Psychological Well-Being Scale-Flourishing Scale

Consisting of 8 items, the Flourishing Scale (FS) was developed by Diener et al. (2010) to provide a good assessment of self-reported overall PWB. Telef (2013) sought the reliability and validity of the Turkish version of the FS as the PWBS. In the adaptation study, the scale yielded a high internal consistency (α = 0.80). Responses to the scale items are rated on a Likert-type scale, ranging from 1 (strongly disagree) to 7 (strongly agree). One may obtain a total PWBS score of 8-56, and higher scores indicate that one enjoys several psychological resources and strengths. Overall, the instrument is valid and reliable for measuring PWB in the Turkish context (Telef, 2013).

Geriatric Health Promotion Scale

The GHP-Scale was developed by Wang et al. in 2015 and adapted into Turkish by Kartal et al. (2021). The instrument consists of 22 items within six subscales assessing behaviors related to health habits, community participation, health responsibility, healthy diet, regular exercise, and oral health. Participant responses are scored on a Likert-type scale ranging from 1 (Never) to 4 (Always). The total score is calculated by summing all item scores and ranges between 22-88. The higher the scores one obtains, the more frequently one implements health promotion behaviors pertinent to the relevant subscale. The internal consistency of the GHP-Scale was calculated to be α = 0.82 in the Turkish adaptation study (Kartal et al., 2021).

Statistics

The study employed various methods to ensure the integrity of the analysis. Nominal data were represented by frequency and percentage, while metric data were expressed as mean and standard deviation. We also adopted the original scoring systems of the instruments while analyzing participant scores. All data were meticulously recorded in a Microsoft Excel spreadsheet. Subsequently, the dataset was transferred to three distinct statistical software platforms for further analysis: SPSS (version 28.0, SPSS Inc., Chicago, IL, USA), Stata (version 17.0, StataCorp, College Station, TX), and MedCalc (version 20.0, MedCalc Software, Mariakerke, Belgium). To assess the validity of the scale, construct validity was evaluated through an exploratory factor analysis (EFA) including examination of scree plots, the Kaiser-Meyer-Olkin measure of sampling adequacy, Bartlett's test

of sphericity, percentage of variance. Additionally, Confirmatory Factor Analysis (CFA) was conducted using SPSS AMOS (version 24, IBM, Chicago, IL, USA). As indicators of model fit, we employed the Cmin/Df (Chi-square/Degrees of freedom), Root Mean Square Error of Approximation (RMSEA), Incremental Fit Index (IFI), Comparative Fit Index (CFI), and Normed Fit Index (NFI). The Chi-square (χ^2) value obtained in our study was found to be high. Due to the large sample size (1,202 participants), the literature indicates that high χ^2 values are commonly observed. Sources such as Barrett (2007) and Kline (2011) emphasize that as the sample size increases, the χ^2 value may also increase. In this context, the model fit indices obtained in our study remained within acceptable limits. Therefore, retaining the current model was deemed appropriate. Fit indices are considered indicators of how well a model fits the data and assume a value between 0-1. A high fit index implies that the model explains a large amount of variance (Beran & Violato, 2010). For example, CFI is a common model-data fit index that assesses the fit of the model relative to a null model. Moreover, a good model-data fit needs to be free of residuals indicated by indices such as RMSEA. Large residuals are a hallmark of poor model-data fit (Beran & Violato, 2010). In this study, an attempt was made to improve model fit by adding covariances between certain factors; however, these modifications did not have a significant effect on the RMSEA value. In addition, the reliability assessment was conducted using several methods, including Cronbach's alpha, the Spearman-Brown split-half coefficient, Hotelling's T-squared test (reported with F and p values), and parallel testing through Bland-Altman plots. The precision of estimates was indicated using 95% confidence intervals (CIs). Exploring the relationships between variables involved Pearson correlation analysis, while factors influencing the dependent variable were investigated through linear regression analysis.

Results

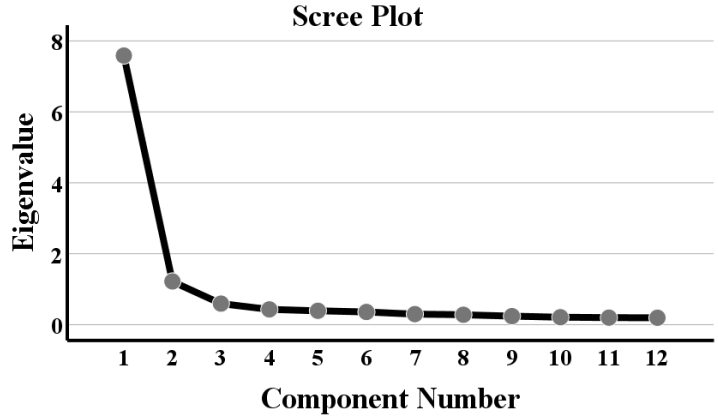
Descriptive Statistics

The total score mean of SPHS is 40.48±12.89 and the item score mean is 3.37±1.07. The scale has a skewness of 0.537 (SE = 0.071) and a kurtosis of -0.010 (SE = 0.141).

Validity and Reliability of the Self-Perceived Health Scale

In the exploratory factor analysis conducted in the study, the direct oblimin rotation method was used to allow for a better representation of the structure in the model by freeing the correlation between factors within the degrees of freedom in the model. When eigenvalue 1 is taken, a two-factor structure is formed. In order to adhere to the original scale, EFA was conducted to create a three-factor structure. In the three-factor structure, the eigenvalue was determined to be 0.593 with a cumulative percentage of variance of 78.327. The findings from the scree plot support the existence of a three-factor structure (H1) (Figure 2).

Figure 2. Scree Plot

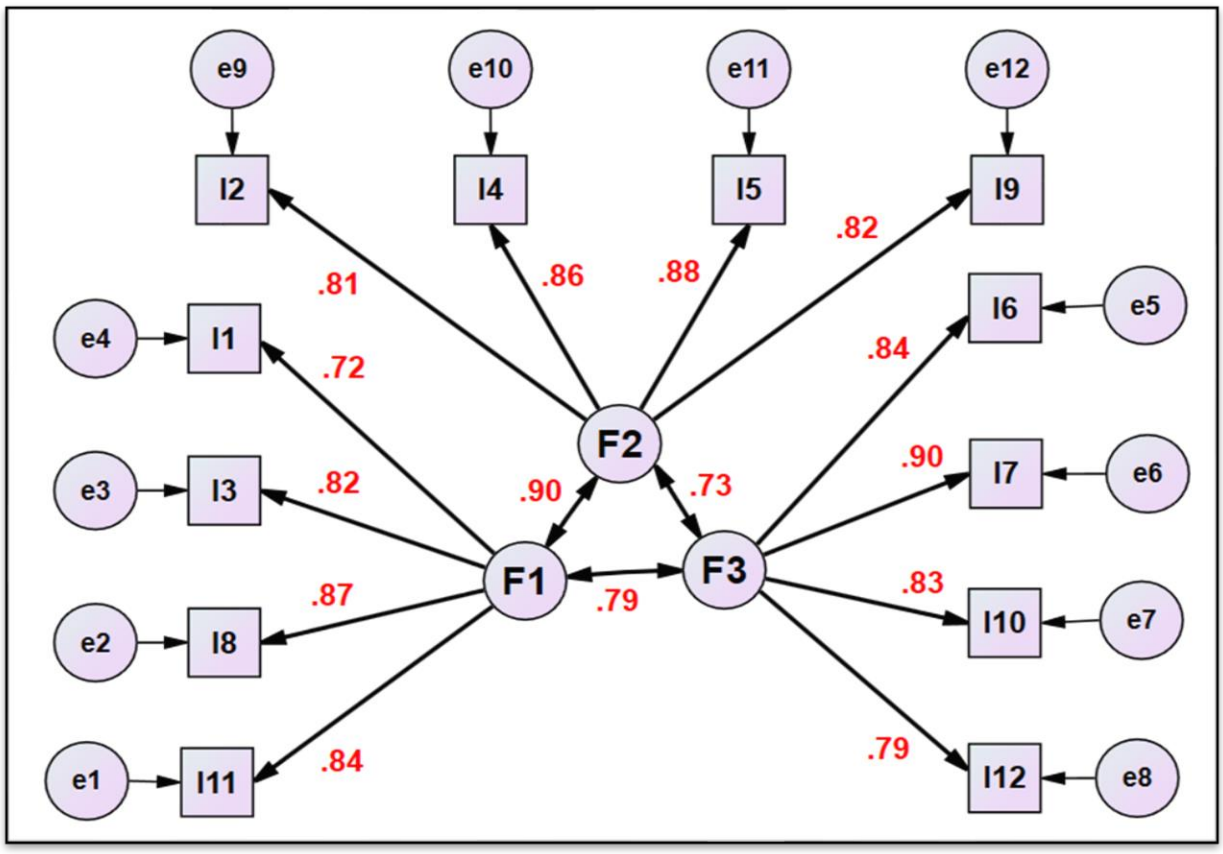


The model exhibited a Kaiser-Meyer-Olkin Measure of Sampling Adequacy of 0.945 and an Approximate Chi-Square value of 11761.840 in Bartlett's Test of Sphericity, with a significance level of $p < 0.001$. The factor loadings of items in the scale ranged from 0.471 to 0.941. In the research, Hotelling's T-squared test,

which evaluates whether individuals' responses to scale items are equal, resulted in a significance level of $p < 0.05$ (Hotelling's T-squared: 489.463, F: 44.126). According to this result, it was determined that there was no response bias in the scale.

In this study, CFA was conducted, and Model fit coefficients were determined as follows: Chi-square (χ^2): 648.879, RMSEA: 0.099 (≤0.050: good fit, 0.050-0.100: acceptable fit), IFI: 0.949 (>0.95: good fit, 0.90-0.95: acceptable fit), CFI: 0.949 (>0.95: good fit, 0.90-0.95: acceptable fit), NFI: 0.945 (>0.95: good fit, 0.90-0.95: acceptable fit). Based on these values, the scale is considered to be consistent in measuring the relevant behavior. The relationship between the factors is at a high level, and the factor loadings of the items are at a good level (H1) (Figure 3).

Figure 3. Confirmatory Factor Analysis



In the context of reliability assessment, Cronbach's Alpha and Spearman Brown Split-Half coefficients were calculated for both the total scale and subgroups, all of which were found to be above 0.85. For the total scale, the Cronbach's Alpha-Spearman Brown Split-Half coefficients were found to be 0.946 and 0.912, respectively (H1) (Table 2).

Table 2. Results of EFA and Internal Consistency of Measurements.

		M	*SD*	Factor Loading	Cronbach Alpha-Spearman Brown Split-Half
F1 PsyHF	I1	3.65	1.35	0.910	0.887-0.853
	I3	3.51	1.29	0.620	
	I8	3.44	1.32	0.471	
	I11	3.26	0.96	0.484	
F1 Total		3.51	1.14		
F2 HLF	I2	3.31	1.31	0.821	0.908-0.909
	I4	3.38	1.30	0.927	
	I5	3.39	1.31	0.913	
	I9	3.40	1.32	0.668	
F2 Total		3.37	1.16		
F3 PhyHF	I6	3.03	1.42	0.835	0.904-0.884
	I7	3.41	1.42	0.834	
	I10	3.52	1.40	0.747	
	I12	2.99	1.52	0.941	
F3 Total		3.24	1.27		
Total		40.46	12.89		0.946-0.912

Note. Kaiser-Meyer-Olkin Measure of Sampling Adequacy: 0.945, Bartlett's Test of Sphericity Approx. Chi-Square: 11761.840, $p<0.001$

A significant positive correlation has been detected at a very high level between the subgroups of the SPHS. A significant positive correlation has also been observed at a moderate level with the SF-12, which is a parallel test. Additionally, a significant positive relationship has been found at a moderate level between SPH and PWB, as well as GHP (Table 3).

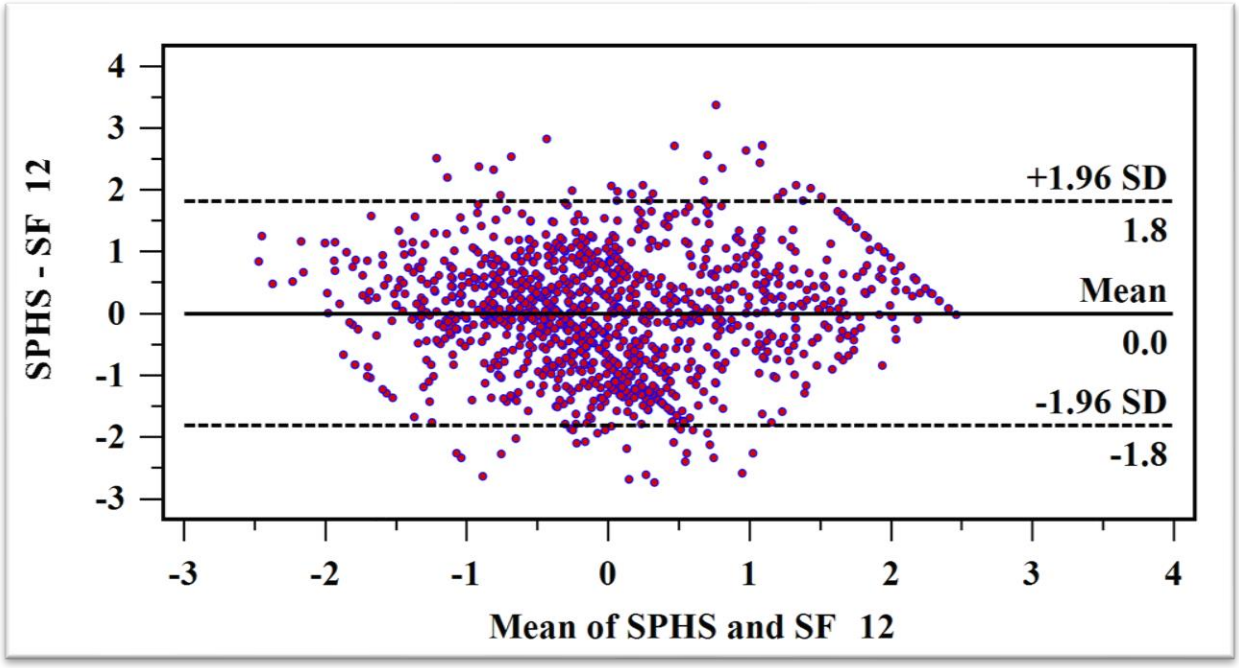
Table 3. Correlations Between Continuous Variables.

	M	***SD***	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
1. SPHS	40.48	12.89	1	.92[a]	.91[a]	.88[a]	**.57[a]**	.49[a]	.42[a]	.55[a]	.52[a]
2. F1 (PsyHF)	3.50	1.14		1	.82[a]	.70[a]	.48[a]	.36[a]	.41[a]	.55[a]	.47[a]
3. F2 (HLF)	3.37	1.16			1	.67[a]	.46[a]	.35[a]	.38[a]	.52[a]	.50[a]
4. F3 (PhyHF)	3.24	1.27				1	.60[a]	.59[a]	.37[a]	.43[a]	.45[a]
5. Total SF-12	85.69	12.81					1	.80[a]	.80[a]	.48[a]	.43[a]
6. PC Score12 (subgroup)	42.00	8.05						1	.28[a]	.36[a]	.33[a]
7. MC Score12 (subgroup)	43.69	7.98							1	.41[a]	.35[a]
8. PWB	38.83	9.63								1	.45[a]
9. GHP	57.86	11.12									1

Interchangeability of the Self-Perceived Health Scale and the SF-12 Short Form

A Bland-Altman analysis was performed to evaluate the agreement and discrepancy between the SPHS and the SF-12, which was evaluated as a parallel/equivalent measure. In this analysis, Z-score values of measurement values were compared to establish a standard between the two measurements. The outcome of the analysis concluded that the two measurements are interchangeable ($p > 0.005$) (Figure 4).

Figure 4. Bland-Altman Plot of the Agreement between the SPHS and SF-12



Factors Contributing to Self-Perceived Health

The study examined the impact of independent variables on the SPH. Univariate analysis revealed that decreasing age, being male, higher education levels, being married, the transition of individuals' living places from towns to metropolises, being employed, improving economic status, being able to perform daily life activities independently, the presence of a chronic illness, having positive interpersonal relationships, the presence of supportive individuals for them, having regular sleep patterns, not smoking, alcohol consumption, the ownership of the living place, regular use of medication, maintaining a healthy diet, PWB, GHP were associated with increased SPH. Significant variables identified in the univariate analysis were included in the multivariate analysis. Variance inflation factors (VIF) were examined for multicollinearity issue, and it was found that all variables were below 2. Backward LR method was used in multivariate linear regression analysis. The results of the multivariate regression analysis showed that among older adults, being male (B: 1.700; 95% CI: 0.509-2.892), the transition of individuals' living places from towns to metropolises (B: 0.688; 95% CI: 0.182-1.195), being employed (B: 1.999; 95% CI: 0.395-3.604), improving economic status (B: 2.141; 95% CI: 1.174-3.108), not smoking (B: 0.819; 95% CI: 0.058-1.580), alcohol consumption (B: 2.901; 95% CI: 1.373-4.429), regular use of medication (B: 3.548; 95% CI: 2.421-4.675), PWB (per 1 point increase) (B: 0.477; 95% CI: 0.413-0.542), GHP (per 1 point increase) (B: 0.317; 95% CI: 0.260-0.374) contribute to increased SPH. The multiple regression model's R2 was 0.464, Adjusted R2 was 0.455, Durbin Watson Test was 1.884, and model ANOVA indicated significance with $p<0.001$ (H2, H3, H4) (Table 4).

Table 4. Univariate and multivariate regression analyses of factors affecting the SPH.

	Univariate regression			Multivariate regression (Backward LR)		
	B	95% CI	*p*	B	95% CI	*p*
Age (years)	-0.177	-0.290--0.064	**0.002**	-	-	-
Gender (female:0, male:1)	2.904	1.430-4.377	**<0.001**	1.700	0.509-2.892	**0.005**

Table 4.*(Continued)*

Educational attainment (per 1 level increase)	2.422	1.823-3.021	**<0.001**	-	-	-
Marital status (Single-widow-divorced:0, Married:1)	2.204	0.705-3.702	**0.004**	-	-	-
Children (no:0, yes:1)	-0.384	-2.566-1.799	0.730	-	-	-
Settlement Region (Mediterranean: 0, Aegean: 1, Others: 2)	0.182	-0.633-0.996	0.662	-	-	-
Settlement Area (Town:0, District:1, Urban Area: 2, Metropolitan: 3)	1.892	1.228-2.556	**<0.001**	0.688	0.182-1.195	**0.008**
Cohabitant (Alone:0, Others:1)	1.684	-0.003-3.370	0.050	-	-	-
Employment (unemployed or retired: 0, Employed:1)	4.894	2.829-6.959	**<0.001**	1.999	0.395-3.604	**0.015**
Income status (per 1 level increase)	7.311	6.215-8.408	**<0.001**	2.141	1.174-3.108	**<0.001**
Activities of daily living, inability to do:0, with support:1)	6.867	4.178-9.556	**<0.001**	-	-	-
Chronic disease (yes:0, no:1)	4.508	3.071-5.946	**<0.001**	-	-	-
Disability (no:0, yes:1)	1.801	-1.751-5.353	0.320	-	-	-
Interpersonal relationships (per 1 level increase)	4.557	3.672-5.442	**<0.001**			
Supporting person (N/A:0, a couple of:1, many:2)	3.722	2.654-4.789	**<0.001**			
Sleep pattern (Always irregular:0, Sometimes irregular:1, Always regular:2)	4.332	3.182-5.482	**<0.001**			
Smoking (Yes:1, Quitted:2, Never:3)	1.009	0.113-1.905	**0.027**	0.819	0.058-1.580	**0.035**
Alcohol use (no:0, yes:1)	2.649	0.751-4.546	**0.006**	2.901	1.373-4.429	**<0.001**
never using drugs in their lifetime (no:0, yes:1)	-1.216	-4.737-2.305	0.498			
Homeowner (no:0, yes:1)	2.182	0.272-4.092	**0.025**			
Regular medication (yes:0, no:1)	6.054	4.616-7.492	**<0.001**	3.548	2.421-4.675	**<0.001**
Healthy diet pattern (no:0, yes:1)	6.723	5.112-8.334	**<0.001**			
Psychological Well-Being total score (per 1 point increase)	0.738	0.675-0.801	**<0.001**	0.477	0.413-0.542	**<0.001**
Geriatric Health Promotion total score (per 1 point increase)	0.605	0.549-0.661	**<0.001**	0.317	0.260-0.374	**<0.001**

R^2: 0.464, Adjusted R^2:0.455, Durbin Watson Test:1.884, Model ANOVA: p<0.00

Discussion

Exploring the Validity and Reliability of the Self-Perceived Health Scale

Participants' Self-Perceived Health Scores

While the mean SPHS item score was reported to be 3.98±1.07 in the original study (Tinajero-Chávez et al., 2023), we calculated it as slightly lower than in the original research (3.37±1.07). In the literature, the rates of those with poor PH were previously suggested as 18% in Spain (Machón et al., 2016) and 24.3% in Canada (Bonner et al., 2017). The variance in PH between our sample and participants in the mentioned studies may be attributed to culture- and measurement-specific factors. For appropriate comparisons, future research may resolve methodological divergence and design a "gold standard" instrument to measure PH. Semantic alterations in translation processes and sample sizes should also be considered when interpreting results. It should also be noted that SPH relies on personal judgment; thus, cultural influences and socioeconomic factors should be minded when evaluating findings.

Construct Validity

Construct validity is recognized as the most robust empirical evidence for testing whether items overlap with the fundamental theoretical structure of the scale (Stein et al., 2013). Factor analysis then contributes to theory building by providing evidence for the construct validity of self-report measurement tools (Williams et al., 2010). Besides, emerging factors are often interpreted with items with factor loadings above 0.30 (Tinsley & Tinsley, 1987). As in the original study (Tinajero-Chávez et al., 2023), EFA yielded a three-factor structure for the SPHS (PhyHF, PsyHF, and HLF), and factor loadings of all items were found to be above 0.40.

KMO index and Bartlett's test of sphericity are often resorted to evaluate the suitability of data for factor analysis. The KMO index assumes a value between 0-1, and a KMO value greater than 0.50 implies the factorability of data (Williams et al., 2010). In this study, we found the KMO value to be 0.945, suggesting that our data set was highly suitable for factor analysis. This value was reported as 0.97 in the original study; nevertheless, it should be noted that it was calculated for 50 items (Tinajero-Chávez et al., 2023). Moreover, Bartlett's test of sphericity is expected to yield a significant result ($p < .05$), and this was the case in this study ($p < 0.001$), implying a consistency between items for factor analysis. The test also gave a significant result ($p = 0.001$) in the original study.

A scree plot is a graphical representation of eigenvalues. While factors to the left before the line flattens out are retained, those failing to the right are considered error factors (Tinsley & Tinsley, 1987). In this research, the findings on the scree plot supported the three-factor structure of the SPHS. Nevertheless, the original study does not provide evidence regarding the scree plot representation of the factors.

Furthermore, it is necessary to select factors equal to the number of eigenvalues explaining at least two-thirds of the total variance (Ozdamar, 2017); this rate can sometimes drop to 50%-60% (Williams et al., 2010). In a single-factorial structure, on the other hand, that single factor is expected to explain at least 40% of the total variance (Alpar, 2018). The total variance explained was 77.82% in the original study, and the authors selected 12 items with item loadings above 0.70 (Tinajero-Chávez et al., 2023). In this study, we found cumulative variance explained by the SPHS to be 78.33%.

The CFA analysis in this study yielded good to acceptable CFI, RMSEA, NFI, IFI, and CMIN/df values. In the original research, the two of these indices were reported as follows: CFI = 0.973, RMSEA = 0.076 (Tinajero-Chávez et al., 2023). For acceptable model-data fit, while a CFI value must be at least 0.90, an RMSEA value must be less than 0.05 (Beran & Violato, 2010; Hu & Bentler, 1999). For acceptable model-data fit, NFI and IFI values must be greater than 0.90 (Manrique-Ruiz Tapia et al., 2022). Overall, the evidence of the CFA models in both studies seems to be sufficient for the construct validity of the SPHS.

Reliability

Cronbach's alpha coefficient is calculated to provide evidence for the internal consistency of a measurement tool (Tavakol & Dennick, 2011). The recommended cut-off classification for Cronbach's alpha coefficients is as follows: unacceptable (< 0.60), minimally acceptable (0.60-0.70), respectable (0.70- 0.80), and excellent (0.80-0.90) (DeVellis, 2017). In the original study, Cronbach's alpha was reported to be 0.933 for the total SPHS score, 0.907 for PhyHF, 0.951 for PsyHF, and 0.926 for HLF (Tinajero-Chávez et al., 2023). Similar to the original research, we computed it as 0.946 for the total score, 0.904 for PhyHF, 0.887 for PsyHF, and 0.908 for HLF.

A single method often remains too inadequate to provide robust evidence for the reliability of a measurement tool. To seek the reliability of a tool, the researcher may also calculate the Spearman-Brown coefficient for participant scores. This coefficient is calculated to determine the reliability of slip-half measurements of a test (Ozdamar, 2017). Since this coefficient assumes a value between 0-1, a value closer to 1 indicates higher internal consistency of the tool (Streiner, 2003). Although the original study reported no split-half reliability of the scale (Tinajero-Chávez et al., 2023), we calculated the Spearman-Brown coefficient to be 0.912 for the total score.

Inter-item consistency is considered to assess response bias in a measurement, demanding to seek differences in mean scores (Ozdamar, 2017; Turkmen et al., 2023). Hotelling's T-squared is a multivariate test that

compares the differences between group response means in a large sample size (Hotelling & Pabst, 1936). The test also allows the evaluation of the difficulty level for each item and whether participants have a common perception of items (Ozdamar, 2017; Turkmen et al., 2023). In this study, the test resulted in no response bias on the SPHS.

Assessing the Interchangeability Between the Self-Perceived Health Scale and the SF-12 Short Form

Self-Perceived Health and Quality of Life

As we believe that the components of SPHS (PhyHF, PsyHF, HLF) and SF-12 (PC, MC) are oriented to measure a similar construct, we adopted the SF-12 as a parallel form of the SPHS and sought correlations between them. The findings yielded a positive moderate correlation ($r = 0.57$; $p < 0.001$) between the SPHS and the SF-12. Pearson correlation coefficient can vary between 1.00 and -1.00 (Stein et al., 2013), and a value of 0.40-0.59 signifies a moderate relationship between variables (Papageorgiou, 2022). Moreover, we performed a Bland-Altman analysis, a data plotting method used to analyze the agreement between two distinct measurements, to assess the interchangeability of these scales (Streiner et al., 2015). The results suggested that the SPHS and the SF-12 can be adopted interchangeably as equivalent tests ($p > 0.005$). The SPHS, like the SF-12, consists of twelve items, and due to all items being in a six-point Likert format, it facilitates ease of use and scoring in practice compared to the SF-12. This study is the first known adaptation of the original scale to different cultures.

Determinants Influencing Self-Perceived Health

Increased Psychological Well-Being

We detected a positive moderate correlation between participants' SPHS and PWBS scores. Meanwhile, the multivariate regression analysis results yielded that increased PWB significantly predicted increased SPH.

The previous research on SPH showed that older Canadian adults without psychological distress had almost four times better SPH than their counterparts suffering psychological distress (Bonner et al., 2017), that SPH was negatively correlated with depression affecting PWB in older European adults (Caramenti & Castiglioni, 2022), and that poor SPH was associated with depression in older Brazilian adults (Caetano et al., 2013).

Our results, overlapping with previous findings, demonstrated that high PWB among older adults contributes to their SPH. Functional losses and loss of social roles among older adults tend to boost their feelings of worthlessness, leading to undesirable psychological conditions (e.g., anxiety, burnout, hopelessness, and depression) and impairing their functional capacity and QoL. Moreover, given that PWB is closely associated with good physical health (Trudel-Fitzgerald et al., 2019), experiences of mental and physical distress would probably exacerbate older adults' SPH.

Increased Frequency of Health Promotion Behaviors

We discovered a moderate relationship between participants' SPHS and GHP-Scale scores. Our multivariate regression analysis showed that the increased frequency of GHP behaviors significantly predicted increased SPH.

A previous study with older Brazilian adults suggested that consuming four or more portions of vegetables and fruits a week, engaging in regular weekly exercise, and not being obese were associated with good SPH (Borim et al., 2012). It was also reported that poor sleep quality and eating habits, absence of cognitively stimulating activities, and not being involved in group social activities predicted poor SPH among older Spanish adults (Machón et al., 2016). The findings of another study showed that rural Chinese people aged 60 years and older with greater SPH had a higher level of participation in health promotion activities. In addition, it is often emphasized that PH is a robust predictor of health promotion behaviors (Xie et al., 2022). In this sense, our findings seem consistent with the results in the relevant literature. SPH has an undeniable role in one's choice of health promotion behaviors (Foottit & Anderson, 2012). Factors oriented to improve physical, cognitive, and psychological health (e.g., physical activity, healthy nutrition, non-smoking, and social participation) are key in improving one's QoL by decelerating functional decline, improving PH, and ensuring active aging among older people (Feng et al., 2020).

Other Factors

Our findings demonstrated that older adults quitting smoking and never smoking had higher SPH than those actively smoking. As non-smokers have higher perceived risks of smoking (Krosnick et al., 2017), they tend to avoid smoking, contributing to their PH. Whereas the best possible option is not to start smoking at all, quitting smoking at an early age brings significant health benefits. Centers for Disease Control and Prevention (CDC) proposes that quitting smoking contributes to one's health by preventing the erratic consequences of multiple diseases, thus increasing one's QoL (Centers for Disease Control and Prevention, 2023). Advocating this proposition, a previous study emphasizes that quitting smoking at an early age is associated with better physical health, mental health, and QoL among older people (Gasperini et al., 2017). In another research, the PH of older adult smokers was almost twice as poor as that of non-smokers (Ho et al., 2003). Significant improvements in PH, measured by the physical and mental components of the SF-36, were discovered among participants treated for nicotine addiction and avoiding smoking for a year compared to those insisting on smoking (Croghan et al., 2005). Hence, it seems that avoiding smoking would favor every aspect of health.

Our results also showed that alcohol use among participating older adults increased their SPH about threefold. A previous study with older Korean adults demonstrated that high alcohol consumption contributed to their SPH (Kim & Cho, 2010). In another study, moderate alcohol consumption in older adults was reported to be associated with positive SPH (Sayed & French, 2016). Alcohol consumption has a complex relationship with health risks (Room et al., 2005). Older people often feel controlled and responsible about alcohol consumption, as highlighted in a meta-analysis states. Additionally, alcohol is suggested to have a key role in utilizing leisure time for their health and well-being. However, it should be noted that even the so-called safe amount of alcohol may be harmful as the physiological tolerability of alcohol declines with age (Bareham et al., 2019). To sum up, a possible reason why alcohol consumption contributes to older adults' SPH may be that, although we did not directly explore it, they consume alcohol at a reasonable amount only in social activities, making them feel overall good.

We discovered an increase in SPH among those without continuous/regular medication. Although the absence of chronic disease was found to significantly increase SPH, as well, in univariate analysis, this significance disappeared in multivariate analysis, probably because the backward LR analysis eliminated variables with multicollinearity problems. It is evident that living free of a disease requiring regular medication affects SPH positively or that the presence of a chronic disease adversely influences SPH. For example, a previous Europe-based study reported an inverse relationship between SPH and chronic diseases among older people (Caramenti & Castiglioni, 2022). Moreover, it is reasonably thought that undesirable old age-linked health conditions (e.g., hearing loss and chronic diseases) may undermine the capacity for physical functionality and social connection and, thus, negatively affect QoL and PH (Foottit & Anderson, 2012). Our finding can then be grounded on the idea that living without regular medication is more likely to refer to the absence of a chronic disease that may be considered a robust indicator of healthy aging, satisfactory QoL, and increased PH.

Gender plays an altering role in one's health since it is characterized by genetic, epigenetic, and hormonal differences (Mauvais-Jarvis et al., 2020). In this study, SPH was discovered to be higher among male participants. The previously mentioned Europe-based research also reported that PH was significantly higher in older adult participants (Caramenti & Castiglioni, 2022). Moreover, male gender was shown as a protective factor for PH in older Brazilian people (Confortin et al., 2015). These consistent findings may be attributed to the idea that men are more biologically resilient than women due to hormone-specific factors, enjoy financial freedom more thanks to their higher participation in employment, have relatively convenient access to healthcare services, and have more visible in the social sphere in many cultures due to their social-socially assigned roles (Vlassoff, 2007). Although male participants showed higher SPH in this study, it should be noted that cardiovascular diseases and cancer are more prevalent among men as they are more inclined to smoke and consume alcohol (Baker et al., 2023). In addition, prospective research may consider that gender is a potent social and psychological modifier of poor PH (Mauvais-Jarvis et al., 2020).

Our results indicated a twofold increase in SPH among employed older adults. Employment allows one to remain involved and mobile. In this sense, a meta-synthesis emphasizes that mobility is linked not only to one's bodily functions but also to their mental, emotional, and social health and perceptions (Goins et al., 2015). However, a sedentary lifestyle and isolation from social life inevitably deteriorate one's health. Previous research exhibited that unemployment (or hesitance to be employed) increased poor SPH among older Brazilian adults (Caetano et al., 2013) and that unemployed and retired older Irish adults had poorer SPH than their counterparts (Darker et al., 2016). Older adults are more likely to experience a situation called "social aging" due to declines in social expectations and social roles (Kalinkara, 2014), having a substantial influence on their physical and psychological health and QoL (WHO, 2024c). Thus, we can assert that older adults' involvement in employment would keep them active and ensure the continuation of their social relationships, which then makes them feel healthier and more productive.

In this study, increasing income status contributed to SPH. Overlapping with this finding, it was once reported that older Canadian people with high income had an SPH level almost twice as well as those with low income (Bonner et al., 2017) and that poor SPH in older Brazilian adults was associated with insufficient income (Caetano et al., 2013). Sufficient income or satisfactory purchasing power is more likely to improve older adults' QoL and PH by increasing their welfare and providing them with more convenient access to paid healthcare services.

Our last result showed that the increased settlement size contributed to participating older adults SPH. In a Nigeria-based study, older adults living in urban areas had more positive perceptions of aging than those living in rural areas, and good SPH was found to be associated with the perception of aging (Cadmus et al., 2021). Similarly, living in a rural area was noted to boost depression and anxiety among older Serbian individuals (Urošević et al., 2015). Nevertheless, another study suggested that living in urban or rural areas did not affect older adults' SPH (Park, 2002). Despite contradictory findings in the literature, we favor the argument that convenient access to healthcare services and socio-cultural opportunities, thanks to living in an urban area, would add to older adults' QoL, leading to positive PH among them.

Limitations and Strengths

The cross-sectional nature of the study necessitates caution when establishing causal relationships. The regional distribution of participants may not fully align with the country's overall demographics. However, the methodological scope of the study, rather than its prevalence, mitigates this issue. While the use of online survey tools such as Google Form offers advantages such as rapid data collection, broad participation, and easy data analysis, there may be an evaluation bias towards specific demographic groups inclined to respond to surveys. This issue has been addressed by increasing the sample size. It is one of the studies that comprehensively analyzes the level of validity and reliability and scrutinizes causality through multiple regression analysis. The innovative aspect of this study lies in its comprehensive approach to understanding the multifaceted nature of PH among older adults. By examining the interplay between QoL, PWB, and health promotion behaviors, it provides a holistic perspective often overlooked in traditional health assessments. In addition to contributing to the existing literature, it sets the stage for future studies exploring the intricate connections between various health determinants in aging populations.

Conclusion

Our study confirmed all four hypotheses that were established. We explored the psychometric properties of the SPHS and concluded that it is a valid and reliable tool for measuring PH among older Turkish adults. Moreover, we discovered a moderate positive correlation between the SPHS and SF-12, and the Bland-Altman analysis yielded that these two scales can be deployed interchangeably. The SPHS is easier to score for practical use. We also determined that PWB and GHP behaviors significantly predicted SPH. In the multivariate analysis, avoiding smoking and alcohol, not using regular medication, male gender, being employed, a favorable income status, and settlement size significantly contributed to participants' SPH. We believe that measuring older adults' SPH is likely to fill a gap in determining their health (physical and psychological) needs. Additionally, self-assessment of health would end up with the acquisition of healthy lifestyle habits. Positive health promotion behaviors and increased psychological well-being seem to improve

one's PH, paving the way for active and successful aging. Future research is also recommended to focus on factors promoting healthy aging.

Abbreviations

Geriatric Health Promotion: GHP

Psychological Well-Being: PWB

Psychological Well-Being Scale: PWBS

Self-perceived Health: SPH

Self-perceived Health Scale: SPHS

Perceived Health: PH

Geriatric Health Promotion Scale: GHP-scale

Short Form Health Survey: SF-12

Quality of life: QoL

Physical Health Factor: PhyHF

Psychological Health Factor: PsyHF

Healthy Lifestyle Factor: HLF

Physical Component (PC)

Mental Component (MC)

Author Contributions. Banu Aslan: Designing the study, data collection, analysis and interpretation, manuscript writing, coordinating and managing the article. Özgür Önal: Statistical analysis and interpretation.

Funding Disclosure. The authors declare that this research was not endowed with any financial support.

Conflicts of Interest. The authors disclose no conflicts of interest pertinent to this study.

Data Availability. The datasets generated and/or analyzed during this study are available from the corresponding author upon reasonable request.

Ethics Approval and Consent to Participate. The ethics committee approval has been obtained from the Ethics Committee Presidency of Suleyman Demirel University. Number of meetings: 75, Number of decisions: 22. Furthermore, informed consent was secured from participants prior to data collection, thereby confirming their voluntary participation in the study.

Acknowledgements. I would like to thank all the authors who developed the Self-Perceived Health Scale (SPHS) for allowing its adaptation into Turkish. Additionally, I would like to thank all the participants who voluntarily answered the surveys.

References

Alpar, R. (2018). *Applied Statistics and Validity-Reliability* (Fifth Edition). Bizim Office Printing and Publishing.

Antczak, E., & Miszczyńska, K. M. (2020). The self-perceived high level of health quality of Europeans – spatial analysis of determinants. *Journal of Applied Economics*, *23*(1), 746–764. https://doi.org/10.1080/15140326.2020.1848308

Baker, P., Leon, N., Colvin, C. J., & Griffith, D. M. (2023). Health policies must consider gender, including men. *The Lancet Global Health*, *11*(12), e1847–e1848. https://doi.org/10.1016/S2214-109X(23)00428-X

Bamia, C., Orfanos, P., Juerges, H., Schöttker, B., Brenner, H., Lorbeer, R., Aadahl, M., Matthews, C. E., Klinaki, E., Katsoulis, M., Lagiou, P., Bueno-de-mesquita, H. B., Eriksson, S., Mons, U., Saum, K. U., Kubinova, R., Pajak, A., Tamosiunas, A., Malyutina, S., … Trichopoulos, D. (2017). Self-rated health and all-cause and cause-specific mortality of older adults: Individual data meta-analysis of prospective cohort studies in the CHANCES Consortium. *Maturitas*, *103*, 37–44. https://doi.org/10.1016/J.MATURITAS.2017.06.023

Bareham, B. K., Kaner, E., Spencer, L. P., & Hanratty, B. (2019). Drinking in later life: a systematic review and thematic synthesis of qualitative studies exploring older people's perceptions and experiences. *Age and Ageing*, *48*(1), 134–146. https://doi.org/10.1093/AGEING/AFY069

Barrett, P. (2007). Structural equation modelling: Adjudging model fit. Personality and Individual Differences, 42(5), 815–824. https://doi.org/10.1016/j.paid.2006.09.018

Beaton, D. E., Bombardier, C., Guillemin, F., & Ferraz, M. B. (2000). Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine*, *25*(24), 3186–3191. https://doi.org/10.1097/00007632-200012150-00014

Beran, T. N., & Violato, C. (2010). Structural equation modeling in medical research: A primer. *BMC Research Notes*, *3*(1), 1–10. https://doi.org/10.1186/1756-0500-3-267/FIGURES/3

Bonner, W. I. A., Weiler, R., Orisatoki, R., Lu, X., Andkhoie, M., Ramsay, D., Yaghoubi, M., Steeves, M., Szafron, M., & Farag, M. (2017). Determinants of self-perceived health for Canadians aged 40 and older and policy implications. *International Journal for Equity in Health*, *16*(1). https://doi.org/10.1186/S12939-017-0595-X

Borim, F. S. A., Barros, M. B. de A., & Neri, A. L. (2012). Autoavaliação da saúde em idosos: pesquisa de base populacional no Município de Campinas, São Paulo, Brasil. *Cadernos de Saúde Pública*, *28*(4), 769–780. https://doi.org/10.1590/S0102-311X2012000400016

Cadmus, E. O., Adebusoye, L. A., & Owoaje, E. T. (2021). Attitude towards ageing and perceived health status of community-dwelling older persons in a low resource setting: a rural-urban comparison. *BMC Geriatrics*, *21*(1), 1–11. https://doi.org/10.1186/S12877-021-02394-5/TABLES/6

Caetano, S. C., Silva, C. M., & Vettore, M. V. (2013). Gender differences in the association of perceived social support and social network with self-rated health status among older adults: a population-based study in Brazil. *BMC Geriatrics*, *13*(1). https://doi.org/10.1186/1471-2318-13-122

Caramenti, M., & Castiglioni, I. (2022). Determinants of Self-Perceived Health: The Importance of Physical Well-Being but Also of Mental Health and Cognitive Functioning. *Behavioral Sciences*, *12*(12), 498. https://doi.org/10.3390/BS12120498

Centers for Disease Control and Prevention. (2023, October 25). *Smoking & Tobacco Use*. Centers for Disease Control and Prevention. https://www.cdc.gov/tobacco/quit_smoking/how_to_quit/benefits/index.htm#:~:text=improves%20health%20status%20and%20enhances,(COPD)%2C%20and%20cancer.

Ceylan, H. (2020). From Social value to social ıssue: aging perception transitioning from traditional society to modern society. In H. Ceylan (Ed.), *Modern Life and Aging* (pp. 25–53). Nobel Academic Publishing Education Consulting Trading Co. Ltd.

Comrey, A. L., & Lee, H. B. (1992). *A First Course in Factor Analysis* (Second Edition). Lawrence Erlbaum Associates Inc.

Confortin, S. C., Giehl, M. W. C., Antes, D. L., Schneider, I. J. C., & D'Orsi, E. (2015). Positive self-rated health in the elderly: a population-based study in the South of Brazil. *Cadernos de Saúde Pública*, *31*(5), 1049–1060. https://doi.org/10.1590/0102-311X00132014

Croghan, I. T., Schroeder, D. R., Hays, J. T., Eberman, K. M., Patten, C. A., Berg, E. J., & Hurt, R. D. (2005). Nicotine dependence treatment: perceived health status improvement with 1-year continuous smoking abstinence. *European Journal of Public Health*, *15*(3), 251–255. https://doi.org/10.1093/EURPUB/CKI076

Darker, C. D., Donnelly-Swift, E., Whiston, L., Moore, F., & Barry, J. M. (2016). Determinants of self-rated health in an Irish deprived suburban population - a cross sectional face-to-face household survey. *BMC Public Health*, *16*(1), 1–14. https://doi.org/10.1186/S12889-016-3442-X/FIGURES/2

de Oliveira, L. F. S., Wanderley, R. L., de Medeiros, M. M. D., de Figueredo, O. M. C., Pinheiro, M. A., Rodrigues Garcia, R. C. M., Almeida, L. de F. D. de, & Cavalcanti, Y. W. (2021). Health-related quality of life of institutionalized older adults: Influence of physical, nutritional and self-perceived health status. *Archives of Gerontology and Geriatrics*, *92*, 104278. https://doi.org/10.1016/J.ARCHGER.2020.104278

DeVellis, R. F. (2017). *Scale Development Theory and Applications* (trans. edit. Tarık Totan, Ed.). Nobel Academic Publishing Education Consulting Trading Limited Company.

Dhanabhakyam, M., & Sarath, M. (2023). Psychological wellbeing: a systematic literature review. *International Journal of Advanced Research in Science, Communication and Technology*, *3*(1), 603–607. https://doi.org/10.48175/IJARSCT-8345

Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D. won, Oishi, S., & Biswas-Diener, R. (2010). New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Social Indicators Research*, *97*(2), 143–156. https://doi.org/10.1007/S11205-009-9493-Y/TABLES/8

Feng, Z., Cramm, J. M., & Nieboer, A. P. (2020). Social participation is an important health behaviour for health and quality of life among chronically ill older Chinese people. *BMC Geriatrics*, *20*(1), 1–10. https://doi.org/10.1186/S12877-020-01713-6/TABLES/3

Foottit, J., & Anderson, D. (2012). Associations between perception of wellness and health-related quality of life, comorbidities, modifiable lifestyle factors and demographics in older Australians. *Australasian Journal on Ageing*, *31*(1), 22–27. https://doi.org/10.1111/J.1741-6612.2011.00526.X

Freidoony, L., Chhabi, R., Kim, C. S., Park, M. B., & Kim, C. B. (2015). The components of self-perceived health in the Kailali district of Nepal: a cross-sectional survey. *International Journal of Environmental Research and Public Health*, *12*(3), 3215–3231. https://doi.org/10.3390/IJERPH120303215

Gasperini, B., Barbadoro, P., Cherubini, A., Pierri, F., D'Errico, M. M., Di Stanislao, F., Ponzio, E., & Prospero, E. (2017). The earlier the better: health-related quality of life is inversely related to age of smoking cessation in older former Italian smokers. *Aging Clinical and Experimental Research*, *29*(4), 655–663. https://doi.org/10.1007/S40520-016-0608-4

Goins, R. T., Jones, J., Schure, M., Rosenberg, D. E., Phelan, E. A., Dodson, S., & Jones, D. L. (2015). Older Adults' Perceptions of Mobility: A Metasynthesis of Qualitative Studies. *The Gerontologist*, *55*(6), 929–942. https://doi.org/10.1093/GERONT/GNU014

Gumà, J. (2021). What influences individual perception of health? Using machine learning to disentangle self-perceived health. *SSM - Population Health*, *16*. https://doi.org/10.1016/J.SSMPH.2021.100996

Ho, S. Y., Lam, T. H., Fielding, R., & Janus, E. D. (2003). Smoking and perceived health in Hong Kong Chinese. *Social Science and Medicine*, *57*(9), 1761–1770. https://doi.org/10.1016/S0277-9536(03)00021-2

Hotelling, H., & Pabst, M. R. (1936). Rank correlation and tests of significance involving no assumption of normality. *The Annals of Mathematical Statistics*, *7*(1), 29–43.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Kalinkara, V. (2014). *Basic Gerontology Science of Aging* (2nd Edition). Nobel Academic Publishing Education Consultancy Trade Ltd. Co.

Kaptan, G. (2016). Definitions of Aging and Old Age. In G. Kaptan (Ed.), *A Multidimensional Perspective on Geriatrics* (pp. 1–14). Nobel Medical Bookstores Trading Limited Company.

Kartal, A., Korkmaz Aslan, G., Kostu, N., & Tumer, A. (2021). Validity and reliability of the Turkish version of Geriatric Health Promotion scale. *International Journal of Nursing Practice*, *27*(1), e12832. https://doi.org/10.1111/IJN.12832

Kim, J. S., & Cho, B. (2010). Association between Self-Perceived Health Status and Health Related Behavior in Routine Health Examinees. *Korean Journal of Family Medicine*, *31*(9), 688–696. https://doi.org/10.4082/KJFM.2010.31.9.688

Kline, R. B. (2011). Principles and Practice of Structural Equation Modeling (T. D. Little, Ed.;

Third Edition). The Guilford Press A Division of Guilford Publications, Inc.

Krosnick, J. A., Malhotra, N., Mo, C. H., Bruera, E. F., Chang, L. C., Pasek, J., & Thomas, R. K. (2017). Perceptions of health risks of cigarette smoking: A new measure reveals widespread misunderstanding. *PloS One*, *12*(8). https://doi.org/10.1371/JOURNAL.PONE.0182063

Machón, M., Vergara, I., Dorronsoro, M., Vrotsou, K., & Larrañaga, I. (2016). Self-perceived health in functionally independent older people: Associated factors. *BMC Geriatrics*, *16*(1), 1–9. https://doi.org/10.1186/S12877-016-0239-9/TABLES/3

Manrique-Ruiz Tapia, M. A., Macías-López, M. P., Murcia-Casas, D. Z., Ramírez, G. L., Barreto, K. T., Torres, L. C. B., Munevar, F. R., & Soares-Filho, P. S. D. (2022). Adaptation and psychometric properties of the Electronic Cigarette Dependence Index (ECDI) in a Colombian sample. *International Journal of Psychological Research*, *15*(1), 20. https://doi.org/10.21500/20112084.5297

Mauvais-Jarvis, F., Bairey Merz, N., Barnes, P. J., Brinton, R. D., Carrero, J. J., DeMeo, D. L., De Vries, G. J., Epperson, C. N., Govindan, R., Klein, S. L., Lonardo, A., Maki, P. M., McCullough, L. D., Regitz-Zagrosek, V., Regensteiner, J. G., Rubin, J. B., Sandberg, K., & Suzuki, A. (2020). Sex and gender: modifiers of health, disease, and medicine. *The Lancet*, *396*(10250), 565–582. https://doi.org/10.1016/S0140-6736(20)31561-0

Mohamad Fuad, M. A., Yacob, H., Mohamed, N., & Wong, N. I. (2020). Association of sociodemographic factors and self-perception of health status on oral health-related quality of life among the older persons in Malaysia. *Geriatrics & Gerontology İnternational*, *20 Suppl 2*(S2), 57–62. https://doi.org/10.1111/GGI.13969

Organization for Economic Cooperation and Development. (2021). *Health at a Glance 2021 : OECD Indicators. Self-rated health*. Organization for Economic Cooperation and Development. https://www.oecd-ilibrary.org/sites/d4751fff-en/index.html?itemId=/content/component/d4751fff-en

Ozdamar, K. (2017). *Scale and Test Development Structural Equation Modeling*. Sozkesen Printing House.

Palladino, R., Lee, J. T., Ashworth, M., Triassi, M., & Millett, C. (2016). Associations between multimorbidity, healthcare utilisation and health status: evidence from 16 European countries. *Age and Ageing*, *45*(3), 431–435. https://doi.org/10.1093/AGEING/AFW044

Papageorgiou, S. N. (2022). On correlation coefficients and their interpretation. *Journal of Orthodontics*, *49*(3), 359–361. https://doi.org/10.1177/14653125221076142/ASSET/IMAGES/LARGE/10.1177_14653125221076142-FIG1.JPEG

Park, J. S. (2002). The Comparative Study on the Health Promotion Life Style and Perceived Health Status of Elderly in Urban and Rural Area. *Journal of Agricultural Medicine and Community Health*, *27*(2), 137–148.

Room, R., Babor, T., & Rehm, J. (2005). Alcohol and public health. *The Lancet*, *365*(9458), 519–530. https://doi.org/10.1016/S0140-6736(05)17870-2

Sayed, B. A., & French, M. T. (2016). To your health!: Re-examining the health benefits of moderate alcohol use. *Social Science & Medicine*, *167*, 20–28. https://doi.org/10.1016/J.SOCSCIMED.2016.08.034

Soylu, C., & Kutuk, B. (2022). Reliability and validity of the Turkish version of SF-12 Health Survey. *Turkish Journal of Psychiatry*, *33*(2), 108–117. https://doi.org/10.5080/u25700

Stein, F., Rice, M. S., & Cutler, S. K. (2013). *Clinical Research in Occupational Therapy* (Fifth Edition). Delmar, Cengage Learning.

Streiner, D. L. (2003). Starting at the beginning: An introduction to coefficient alpha and internal consistency. *Journal of Personality Assessment*, *80*(1), 99–103. https://doi.org/10.1207/S15327752JPA8001_18

Streiner, D. L., Norman, G. R., & Cairney, J. (2015). *Health Measurement Scales* (Fifth Edition). Oxford University Press.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, *2*, 53. https://doi.org/10.5116/IJME.4DFB.8DFD

Telef, B. B. (2013). The adaptation of psychological well-being into Turkish: a validity and reliability study. *H. U. Journal of Education*, *28*(3), 374–384. http://www.efdergi.hacettepe.edu.tr/shw_artcl-237.html

Tinajero-Chávez, L. I., Mora-Romo, J. F., Bravo-Doddoli, A., Cruz-Narciso, B. V., Calleja, N., & Toledano-Toledano, F. (2023). Design, development, and validation of the Self-Perceived Health scale (SPHS). *Healthcare (Basel, Switzerland)*, *11*(14). https://doi.org/10.3390/HEALTHCARE11142007

Tinsley, H. E. A., & Tinsley, D. J. (1987). Uses of factor analysis in counseling psychology research. *Journal of Counseling Psychology*, *34*(4), 414–424. https://doi.org/10.1037/0022-0167.34.4.414

Trudel-Fitzgerald, C., Millstein, R. A., Von Hippel, C., Howe, C. J., Tomasso, L. P., Wagner, G. R., & Vanderweele, T. J. (2019). Psychological well-being as part of the public health debate? Insight into dimensions, interventions, and policy. *BMC Public Health*, *19*(1), 1–11. https://doi.org/10.1186/S12889-019-8029-X/TABLES/2

Turkmen, H., Eksioglu, A., Oran, N. T., & Erdogan, A. (2023). Readiness for Weaning Scale: Development and psychometric measurement study. *Infant and Child Development*, e2471. https://doi.org/10.1002/ICD.2471

Urošević, J., Odović, G., Rapaić, D., Davidović, M., Trgovčević, S., & Milovanović, V. (2015). Quality-of life of the elderly in urban and rural areas in Serbia. *Vojnosanitetski Pregled*, *72*(11), 968–974. https://doi.org/10.2298/VSP140831107U

Vlassoff, C. (2007). Gender Differences in Determinants and Consequences of Health and Illness. *Journal of Health, Population, and Nutrition*, *25*(1), 47. /pmc/articles/PMC3013263/

Wang, J., Lee, C. M., Chang, C. F., Jane, S. W., & Chen, M. Y. (2015). The development and psychometric testing of the geriatric health promotion scale. *The Journal of Nursing Research : JNR*, *23*(1), 56–64. https://doi.org/10.1097/JNR.0000000000000077

Ware, J. E., Kosinski, M., & Keller, S. D. (1995). *SF-12: How to Score the SF-12 Physical Mental Health Summary Scales* (Second Edition). MA: The Health Institute, New England Medical Center.

Williams, B., Onsman, A., & Brown, T. (2010). Exploratory factor analysis: A five-step guide for novices. *Journal of Emergency Primary Health Care (JEPHC)*, *8*(3), 1–13. https://doi.org/10.33151/AJP.8.3.93

World Health Organization. (2022, October 1). *Ageing and health*. World Health Organization. https://www.who.int/news-room/fact-sheets/detail/ageing-and-health

World Health Organization. (2024a). *Health and Well-Being*. World Health Organization. https://www.who.int/data/gho/data/major-themes/health-and-well-being

World Health Organization. (2024b). *Promoting Well-Being*. World Health Organization. https://www.who.int/activities/promoting-well-being

World Health Organization. (2024c). *Social Isolation and Loneliness*. World Health Organization. https://www.who.int/teams/social-determinants-of-health/demographic-change-and-healthy-ageing/social-isolation-and-loneliness

Xie, X., Du, J., He, J., Liu, Y., & Li, Z. (2022). Perceived health competence and health education experience predict health promotion behaviors among rural older adults: A cross-sectional study. *BMC Public Health*, *22*(1). https://doi.org/10.1186/S12889-022-14080-1

Yildirim, S., & Sahin, F. (2020). Aging and Social Work. In H. Ceylan (Ed.), *Modern Life and Aging* (pp. 55–95). Nobel Academic Publishing Education Consulting Trading Co. Ltd.