Research Paper
Psychometric Properties of the Persian Version of the Social Health Scale for the Elderly

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ABSTRACT

Background: Changes in physical, economic, and social conditions during old age are inevitable. These changes can reduce the social health of older adults. The Social Health Scale for the Elderly (SHSE) is a specific tool for evaluating social health in older adults. This study aimed to evaluate the psychometric properties of the Persian version of the scale in an Iranian population.

Methods: This methodological study investigated the psychometric properties of the Persian version of SHSE in Iranian older adults residing in Ardabil city. A total of 200 older adults (60 years and older (were selected using a multi-stage random sampling. Construct validity was assessed through confirmatory factor analysis (CFA). Reliability was evaluated using Cronbach's α coefficient and intraclass correlation coefficient (ICC) by conducting test re-test reliability over a two-week interval. Data were analyzed using SPSS software, version 16 and EQS 6.1 software.

Results: The SHSE has previously been translated into Persian based on the Wild et al model, and in this study, psychometric testing was conducted on the translated version. The impact score of all of the items in the face validity assessment was higher than 1.5. The content validity ratio (CVR) assessment confirmed the relevance of the scale's items without necessitating any changes in content or item count. The scale-content validity index (S-CVI) was 0.94. Following CFA, three items were removed, confirming a three-factor structure for the scale. Cronbach's alpha coefficient for the subscales of social support, social adjustment and perceived environment resources was α=0.92, α=0.77, and α=0.72, respectively. Additionally, the intra-class correlation coefficient was estimated at 0.79.

Conclusion: The Persian version of the SHSE with 22 items and 3 subscales is a valid and reliable tool for measuring the social health of older adults in Iranian society. The SHSE's three-factor structure aligns well with the multidimensional nature of social health. This validated tool can support healthcare providers, policymakers, and researchers in implementing strategies to enhance social health and overall well-being in older adults.

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Highlights

● The SHSE supports healthcare interventions, allowing providers to assess social health and encourage active aging.

● Three items were removed from the scale through rigorous psychometric analysis to align with the Iranian context.

● High reliability (the Cronbach α of 0.92) and stability (intra-class correlation coefficient of 0.79) were achieved.

● The three dimensions of scale (social support, social adjustment, and perceived environmental resources) enable a comprehensive social health assessment for older adults.

Plain Language Summary

This study validated a Persian version of the social health scale for the elderly (SHSE) to assess social health among Iranian older adults. The study confirmed the scale's reliability and validity after removing three items to improve accuracy. The finalized 22-item SHSE effectively measures social support, social adjustment, and perceived environmental resources. The Persian version of SHSE is a reliable tool for evaluating social health in Iranian older adults.

Introduction

Social health refers to an individual's ability to form and maintain positive interpersonal relationships, actively participate in social groups, and feel supported and valued in society. It extends beyond personal connections to encompass social infrastructure, including access to social programs and safe environmental resources. In other words, social health is a critical dimension of overall well-being, focusing on meaningful relationships, social participation, and a sense of belonging (Doyle & Link, 2024).

Social health, as a fundamental dimension of overall health, is crucial for maintaining a balanced social life and fostering social development (Izadi-Avanji et al., 2023). A study in Iran found that older adults with stronger social health exhibited better self-care behaviors (Mohammadi et al., 2017). Older adults with higher social health can adapt better to changing social roles, participate in group activities, and conform to social norms (Hassanpour et al., 2021). Furthermore, higher psychological and social well-being are associated with a lower risk of age-related decline in physical function (Saadeh et al., 2020). A positive correlation has been found between social support and happiness in older adults (Beygi et al., 2023). These findings highlight the significance of social health, psychological support, and the development of an elderly-friendly city (Lalegani, 2024). Therefore, evaluating social health in older people seems crucial.

The literature review identified two existing questionnaires developed to assess social health. The first is the Iranian social health questionnaire, which comprises 7 subscales: Social interaction, social responsibility, conscientiousness, attitude toward society, empathy, family relations, and social participation (Rafiey et al., 2017). The second is the Keyes social well-being questionnaire (Keyes, 1998). Both instruments are general and do not specifically target the social health of older adults. Considering the distinctive characteristics of aging and the critical role of social health in this population, it is essential to use specialized and comprehensive tools for measuring social health in older adults.

Bao et al. (2018) developed the social health scale for the elderly (SHSE), a 25-item tool with 3 subscales: Social adjustment, social support, and perceived environmental resources. This scale demonstrated acceptable validity and reliability. Considering the global growth of the elderly population and the diverse social, economic, and cultural conditions facing Iranian elderly individuals, as well as their impact on their social health, the present study aimed to determine the psychometric properties of the Persian version of the SHSE.

Materials and Methods

This methodological study aimed to examine the psychometric properties of the Persian version of SHSE. The inclusion criteria included being over 60 years old, providing informed consent, demonstrating cognitive health based on the abbreviated mental test (AMT score ≥8), and being capable of answering questions. AMT evaluates el-

derly patients for possible dementia (Hodkinson, 1972). It has 10 items, and one point is given for each correct answer. In this test, 0–3 is suggestive of severe impairment, 4–7 indicates moderate impairment, and 8 and above is indicative of normal cognitive function.

Multistage cluster sampling was used in this study. Bao et al. (2018), as the instrument developers, assessed the social health of older adults in their research in China using the 25-item SHSE scale. The scale comprises 3 subscales: Social support (12 items), social adjustment (6 items), and perceived environment resources (7 items). The scores range from 5 to 125, with higher scores indicating greater social health. The scale developer has reported optimal validity and reliability for the questionnaire. The Cronbach α coefficient was estimated at 0.79, and the weighted kappa for inter-rater reliability was 0.75. In addition, the root mean square error of approximation (RMSEA), goodness of fit index (GFI), and adjusted GFI (AGFI) were reported as 0.09, 0.97, and 0.93, respectively (Bao et al., 2018).

Fahimian et al. (2023) translated SHSE into Persian based on the model of Wild et al. (2005). In their study, exploratory factor analysis (EFA) confirmed the scale's three-factor structure, accounting for 39.47% of the total variance in social health. Regarding the face validity, all items had an acceptable impact score. The content validity ratio (CVR) for each item was 0.72, and the content validity index (CVI) for each item was 0.968, both of which were acceptable. Two items had a CVR of less than 0.62, which was retained in the scale to maintain its integrity, given that the scale was translated. Additionally, the Cronbach α of the scale was 0.841, and for the subscales of social adjustment, social support, and perceived environmental resources, the values were 0.771, 0.338, and 0.62, respectively (Fahimian et al., 2023). The low internal consistency of the perceived environment resources subscale and the explained variance warranted a confirmatory factor analysis (CFA).

With permission from the tool developer (Bao et al., 2018), this study evaluated the psychometric properties of the SHSE, including face and content validity, construct validity via EFA and CFA, internal consistency, and stability.

Face validity

To assess face validity, the instrument was administered to 12 older individuals, and their opinions regarding the ambiguity, difficulty in understanding the items, and the relevance of the items to the instrument's purpose were solicited. In addition, the older adults were asked to rate each item in terms of importance based on a 5-point Likert scale (very important, important, moderately important, somewhat important, and not at all important). An impact score was calculated using the Equation 1:

1. Importance×Frequency (%)=Impact score

Additionally, item scores exceeding 1.5 were subjected to further analysis (Thomas & Harrison, 2020). In this study, all items had an impact score >1.5

Content validity

The CVR and CVI were used to evaluate the content validity of the scale. The instrument was given to 12 experts, including geriatric nurses, gerontologists, and experts in instrument development and evaluation. They were asked to provide their opinions regarding the necessity of each item (CVR) on a 3-point Likert scale (1=not necessary, 2=useful but not necessary, and 3=necessary). The responses were calculated using the related formula and Lawshe table (Ayre & Scally, 2014; Lawshe, 1975). A higher score indicates stronger expert agreement on the items (Marie et al., 2021). In addition, the experts rated the relevance of each item on a four-point Likert scale (CVI). The results showed that only the CVR scores of items 13 and 24 were less than 0.56 based on the Lawshe scale. However, the two items were retained in the instrument. The CVI value for all items was greater than 0.80 (Ebadi et al., 2016; Polit & Beck, 2008).

Construct validity

Construct validity was assessed using CFA. The sample consisted of 200 older adults selected from Ardabil comprehensive health centers in 2023. While there is no definitive consensus on the minimum sample size for structural equation modeling (SEM) and CFA, 200 subjects is a commonly considered benchmark (Munro, 2005; Kline, 2023).

The sample was selected from older adults with a file in urban comprehensive health service centers through multistage cluster sampling. Ardabil has 30 urban comprehensive health centers. First, 35% of centers were selected using simple random sampling, and the number of samples in each center was determined based on the total number of older adults covered, also selected using a simple random method. Then, the older adults were contacted by phone and invited to participate in the study.

After obtaining informed consent, a cognitive test was administered, and participants with an AMT score of 8 or higher were recruited for the study. In the next stage, the SHSE items and the background information questionnaire (with 8 questions on age, sex, marital status, underlying disease, occupation, education, income, and number of children) were read aloud to the older adults, and their responses were recorded.

Internal consistency was assessed by calculating Cronbach α coefficients of the samples in the CFA. To examine stability, the test re-test method was employed with 20 older adults selected by convenience sampling. Participants completed the questionnaire at two-week intervals (Dutil et al., 2017). The intraclass correlation coefficient (ICC) between scores from the two assessments was calculated, and the internal consistency score above 0.7 was considered satisfactory (Polit & Beck, 2020). Additionally, the standard error of measurement (SEM) was calculated based on the type of agreement and the smallest detectable change (SDC) (van Kampen et al., 2013).

Data analysis

Data analysis was conducted using SPSS software, version 16 and AMOS software, version 23.0. The construct validity was tested by applying EFA and CFA. The Kaiser–Meyer–Olkin (KMO) test was used to determine the sampling adequacy of the data. Bartlett's test of sphericity revealed a correlation in the data. EFA was run using the principal component analysis (PCA) method and the varimax rotation technique to extract factors. The eigenvalue >1.0 was considered to explain the total variance. Factor loadings <0.3 were suppressed. The Cronbach α coefficient was used to assess internal consistency, while the intra-class correlation coefficient was employed to evaluate inter-rater reliability. SEM and SDC were calculated with the Equation 2:

2. $SEM = SD \times (1-ICC)$, $SDC = 1.96 \times \sqrt{2} \times SEM$

Fit indices included the chi-square distribution, normed fit index (NFI), non-NFI (NNFI), comparative fit index (CFI), GFI, RMSEA, Akaike information criterion (AIC), and expected cross-validation index (ECVI). A significance level of <0.05 was considered statistically significant.

Results

The mean age of the older adults was 70.1±10.1 years, with a range of 60 to 100 years. Furthermore,

115 participants (57.5%) had at least one chronic disease. Table 1 summarizes the demographic characteristics of the sample.

CVR analysis, using the Lawshe table and expert review, revealed a minimum item score of 0.56. The scale-CVI (S-CVI) was 0.94, with individual scores of 0.80 for fluency, 0.86 for clarity, and 0.89 for relevance.

Before performing CAF, EFA was conducted using the PCA method and varimax rotation. The KMO measure and Bartlett's test confirmed the sampling adequacy. An eigenvalue <1 was used to determine the number of factors in the scale. EFA identified three factors that explained 47% of the total variance of the scale (Table 2).

Construct validity was assessed using CFA, with results indicating a moderately good model fit as evidenced by a CFI of 0.59 and RMSEA of 0.08 (Table 3).

Given the low correlations of items 13 (social support), 24 (social adjustment), and 25 (perceived environmental resources), these items were removed from the CFA model, leading to improved model fit indices. In addition, the impact score of item 13 was less than 1.5, and the CVR values of items 13 and 24 were unacceptable according to the Lawshe table. Therefore, their exclusion from the model was predictable. The scale reliability, as measured by Cronbach α, was 0.81. Subscale reliabilities ranged from 0.70 to 0.92 (Table 2).

The ICC value was also 0.79 (95% CI; 0.72%, 0.82%). This reveals the strong stability of the SHSE over time and the excellent reliability of the scale (Table 2). The SEM value indicated that if the test is repeated for an individual, the resulting score may change by ±2.12, which can be attributed to measurement error. The SDC, measured by the SHSE at a 95% confidence level, was estimated to be 4.03. This figure represents the smallest change in an individual's scores. The values of SEM and SDC indicate the scale's ability to detect meaningful changes over time. Thus, the responsiveness of the scale is desirable, as calculated by the minimal important change (MIC) of 4.15. Comparing this value with the SDC, it was determined that the scale is capable of detecting minimally important changes in measuring social health (Table 2).

Scoring

Scoring of the SHSE scale is based on a 5-point Likert scale, as per the instrument developer's instructions. None of the items is reverse-scored. A higher score indicates greater social health. The score range of the scale is between 22 and 110.

Table 1. Frequency distribution of sociodemographic characteristics of the older adults (n=200)

Qualitative Variables		No. (%)/Mean±SD
Sex	Female	89(44.5)
	Male	111(55.5)
Marital status	Married	158(79)
	Single (divorced, widowed)	42(21)
Job	Retired	71(35.5)
	Self-employed (worker, farmer, seller, technician)	55(27.5)
	Housekeeper	74(37)
Education	Illiterate	62(31)
	Under diploma	87(43.5)
	Diploma and over	51(25.5)
Income	Sufficient	105(52.5)
	Insufficient	95(47.5)
Having an underlying disease	Yes	115(57.5)
	No	85(42.5)
Age (y)	60-100	70.1±10.1
Number of children	0-10	3.7±2.1

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Client- Centered Nursing Care

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Discussion

The study aimed to psychometrically evaluate the Persian version of the SHSE in an Iranian population. The face validity evaluation, which included expert reviews and feedback from the target group, confirmed the quality of the scale items. The content validity score for each item exceeded 0.80, indicating that the SHSE comprehensively measures the intended construct. The high CVI scores suggest a rigorous process of content and face validation by both experts and the research team (Hemmati Maslak Pak & Hashemlo, 2015).

Bao et al. (2018) focused on face and content validity, this study explored construct validity using CFA. The initial Persian version of the SHSE, comprising 25 items and 3 subscales, exhibited poor fit, with a total variance explained of less than 50%. It has been stated that newly developed instruments should account for at least 60% of the total variance (Beck et al., 2010). Accordingly, three items were excluded to improve model fit. These items included: Item 13, "In the past year, how often have you done chores?" from the social ad-

justment subscale; item 24, "In the past year, how often have you participated in organized community activities?"; and item 25, "Which public services have been provided to you free of charge in the past year?" from the perceived environment resource subscale. Item 13 was removed due to its very low correlation coefficient, which may reflect prevailing cultural norms whereby males are less likely to engage in chores, while female older adults often rely on support from their children due to physical limitations.

Moreover, retirement often coincides with a decline in physical and mental capabilities, making it more challenging for older adults to engage in daily activities, such as housework (Carmona-Torres et al., 2019). Therefore, the removal of item 13 may be justified.

Items 24 and 25, both related to perceived environmental resources, were also removed due to low correlations. It has been reported that changes in economic and social structures can lead to a decrease in social interaction among older adults, particularly those who have retired and experienced job loss, resulting in a sense of isolation

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Izadi-Avanji., et al., 2025. Persian Version of the Elderly's Social Health Scale. *JCCNC*, 11(3), pp. 229-236.

Table 2. Development of candidate items

SHSE by an Expert Team			25 Items
Stage 1. Questionnaire construction	Evaluation by older adults (n=12)	Face validity	Qualitative face validity: 25 items were reviewed and revised. Quantitative face validity: The impact score of only one item (item 24) was <1.5.
	Evaluation by experts (n=12)	Content validity	Qualitative content validity: Four items were amended. Content validity ratio (essential): Two items had CVR<0.56 (items 13, 24). CVI (relevancy): I-CVI value of all items >0.80. S-CVI/Ave=0.94.
Stage 2. Evaluating psychometric properties of the scale	Main study (n=200)	Structural validity with EFA	Three-factor model; social support (12 items); social adjustment (6 items); perceived environment resource (7 items) KMO (sampling adequacy)=0.863; χ^2=2240.553, P=0.001. Communality values for 3 items (13, 24, and 25) were <0.1. Total explained percentage variance=47.48. The factor loading of three items (13, 24, and 25) was <0.3.
	Main study (n=200)	Structural validity with CFA	Three items were removed to fit the model (items 13, 24, and 25). SHSE=22 items (final version)
Scale's reliability and stability	The sub-sample (n=200)	Internal consistency	Cronbach α=0.81, subscales: Social support=0.92, social adjustment=0.76 0.76 and perceived environmental resources=70.
	The sub-sample (n=13)	Test re-test reliability	ICC=0.79; 95% CI; 0.72%, 0.82%; SEM agreement=2.12; SDC_{95}=4.03; MIC=4.15

Abbreviations: CVR: Content validity ratio; CFA: Confirmatory factor analysis; EFA: Explanatory factor analysis; I-CVI: Item content validity index; KMO: Kaiser–Meyer–Olkin; S-CVI/Ave, scale content validity index/average; ICC: Intra-class correlation coefficient; SEM agreement, standard error of measurement; SDC_{95}: Smallest detectable change; MIC: Minimal important changes.

Table 3. Fit Indices of the Persian version of the SHSE

Fit Indices of the Model*		Normal Values	Modifying Model	
			Before	After
Parsimonious fit indices	RMSEA	Excellent: <0.05 Good: 0.05-0.1 Weak: >0.01	0.08	0.05
	χ^2/df	<3 suitable	2.25	1.2
Adaptive fit indices	CFI	>0.9	0.59	0.94
	NFI	>0.9	0.46	0.85
	NNFI	>0.9	0.55	0.92
Absolute fit indices	GFI	>0.9	0.87	0.88
	AGFI	>0.9	0.85	0.85
Relative fit indices	AIC	-	536.796	391.167
	ECVI	-	2.365	1.72

Abbreviations: RMSEA: Root mean square error of approximation; NFI: Normed fit index; NNFI: Non-normed fit index; GFI: Goodness of fit index; AGFI: Adjusted goodness of fit index; CFI: Comparative fit index; AIC: Akaike information criterion; ECVI: Expected cross-validation index.

and loneliness. Given the reduced social engagement among older adults and the economic challenges faced by many in Iran, the removal of items 24 and 25, which relate to organized activities and public services, seems reasonable (Farzane & Alizadeh, 2013; Lashkarboloki et al., 2015). The economic sanctions and financial hardships in Iran have limited access to healthcare and other resources for older adults, making these questions less relevant to their experiences (Kim et al., 2020; Miri et al., 2019).

The removal of items 13, 24, and 25 resulted in a well-fitting model for the Persian version of SHSE. This finding is consistent with findings from a similar study by Keyes (Keyes, 1998). His study's CFA supported our EFA results, and most of the fit indices were deemed optimal. The reliability analysis of the Persian version of the SHSE yielded a coefficient of 0.80 after removing three items. Literature review suggests that an alpha coefficient below 0.60 indicates weak internal consistency. Conversely, values closer to 1.0 suggest stronger internal consistency (Kim et al., 2020). The stability reliability results (ICC=0.79) demonstrated an adequate correlation among the remaining statements. Polit and Beck (2020) generally considered a reliability coefficient above 0.70 satisfactory, while coefficients exceeding 0.8 and 0.9 were considered very good and ideal, respectively (Ebadi et al., 2016). The study by Fahimian et al (2023) on the Persian version of SHSE reported an overall internal consistency of 0.62 and a perceived environment resource subscale score of 0.338, suggesting the need for revision of items related to perceived environment resources. This finding aligns with a previous Iranian study that identified the lowest score for the perceived resources subscale in the current tool (Izadi-Avanji et al., 2023). In our study, removing items with low correlation coefficients (13, 24, and 25) improved internal consistency, likely due to the scale's original design in China, which may not fully align with the economic and social services available in Iran. The correlation coefficients calculated in our study indicate good stability and repeatability.

Conclusion

The Persian version of the SHSE was confirmed as a valid and reliable instrument in Iranian society by removing 3 items. The SHSE can play a significant role in guiding nursing interventions by providing a comprehensive assessment of the social health of older adults. The scale can help nurses detect the levels of social isolation and loneliness, which are critical risk factors for mental health issues like depression and anxiety. With this information, nurses can design interventions such as social support programs or community engagement activities. Regularly using the scale can help track changes in an older adult's social health over time. This enables timely interventions if social health deteriorates, ensuring proactive care that leads to improved physical health outcomes, reduced healthcare costs, and a higher quality of life for older adults. It is recommended that a study be conducted to evaluate the validity and reliability of the Persian version of the SHSE in older adults with chronic diseases.

Ethical Considerations

Compliance with ethical guidelines

The study was approved by the Ethics Committee of Kashan University of Medical Sciences, Kashan, Iran (Code: IR.KAUMS.NUHEPM.REC.1400.005). Participation was voluntary, and all participants signed an informed consent after being informed about the research objectives. Participants were assured that their information would be kept confidential and that they could withdraw from the study at any time. They had the opportunity to be informed about the study's results.

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