

Validity and Reliability of Persian Version of the 12-Item Expectations Regarding Aging Survey Iranian Older Adults Population during COVID-19 Pandemic.

Hamid Sharif Nia

Mazandaran University of Medical Sciences Faculty of Nursing and Midwifery

Long She

Taylor's University Taylor's Business School

Sotheeswari somasundram

Taylor's University Taylor's Business School

Fatemeh khoshnavay fomani

Tehran University of Medical Sciences School of Nursing and Midwifery

Omolhoda kaveh

Mazandaran University of Medical Sciences Faculty of Nursing and Midwifery

lida Hosseini (✉ l.hosseini69@gmail.com)

Iran University of Medical Sciences <https://orcid.org/0000-0001-7635-1710>

Research

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Abstract

Background: The current pandemic has classified older people into the most vulnerable category. Prior to the pandemic, they led active social lives, but are now cautioned to adopt more precautionary and preventive behaviors. Older people are advised to change their lifestyle given the challenges and expectations regarding aging. Therefore, the present study is designed to assess the construct validity and reliability of the Persian version of the 12-Item Expectations Regarding Aging Survey among older adult Iranian population during COVID-19 pandemic.

Methods: The Persian version of this scale was developed using translation and revision in current study. The construct validity was assessed through Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA). Also, the reliability was assessed through its internal consistency (Cronbach's alpha and McDonald's omega), composite reliability (CR), and maximal reliability (MaxR). The data compiled online was based on a sample of 400 older adults aged above 65 years.

Results: The results of the study indicate that the Persian version of this scale comprises three factors with 11 items (Factor 1: Physical Health; Factor 2: Mental Health; Factor 3: Cognitive Function) that explaining 65.764% of the total variance. The CFA results, after reviewing the model modification indices, shows the revised three factors model fits the data well with excellent internal consistency and reliability.

Conclusion: The finding indicates that the Persian Version of ERA is reliable and valid. It can be used for aging, educational, and clinic research, to develop and evaluate on suitable intervention to enhance the quality of life among Iranian aging population.

Introduction

With the onset of Covid 19 disease, the World Health Organization (WHO) has identified quarantine and social isolation as one of the safest ways to control and combat the disease. However, the quarantining a large segment of society will not be without the much dreaded psychological, social and economic effects (1). As a result, older people with active social life are probably experiencing major changes in their normal routine of life, leading to feelings of isolation, loneliness, or low mood (2).

Aging is a critical process of life where physical and mental needs are considered social necessity, and close attention on health-promoting behaviors is essential (3). As part of the aging process, older people would experience change in personality and behaviour, with incidences of loneliness and depression reported as common problems among the elderly (4, 5). Studies indicate that loneliness is a painful and nettlesome feeling for older people (6, 7), with possibility of multiple negative physical and mental health concerns (8). Needless to say, loneliness and depressions an existing concern among older people is exacerbated during the pandemic. Studies highlight that concerns regarding COVID-19 are higher among older (9), expressing higher vulnerability which impacts their overall attitude to aging (10). The concerns expressed by the elderly is likely justified as the fatality rate of COVID-19 is higher among older compared

to younger adults. The health concern is connected to the level of expectations regarding aging, hence the importance of addressing this concern among the elderly (11).

Aging expectations (ERA) are beliefs that people have about their level of physical and cognitive health with age (12). The concept of “successful” aging as an alternative to “usual” aging was first mooted by Rowe and Kahn (1997) focusing on importance of health promotion and disease prevention. The proposition was for the elderly to play an active role in their health to enjoy full life as much as possible while maintaining full function (13).

Studies show that there is a positive relationship between attitude and tendency to participate in health-promoting behaviors such as physical activity, stress management, interpersonal relations, increased longevity and a better quality of life in older adults(14-20). Correspondingly, negative expectations were associated with lower ability to engage in physical activity, accepting a more sedentary lifestyle, a higher likelihood of experiencing acute medical events, negative health outcome, cognitive decline, and emotional responses to stress (21-24) and feelings of loneliness (25).

The importance of expectation in achieving and maintaining a high level of physical and mental function was explored by Sarkisian et al (2002) with a 38- item survey to measure expectations regarding aging (ERA-38) in the USA. The scale incorporated items of general health, cognitive function, mental health, functional independence, sexual function, pain, sleep, fatigue, urinary incontinence and appearance. Higher scores on the ERA-38 expressed an increased attainment of high physical and mental functioning with aging (12). It was interesting to note that functional status and the psychosocial components of health, such as depressive symptoms, social functioning, emotional well-being, and biological and cultural status have a more significant impact on perceptions compared to others aspect (26). It was also noted that older adults’ age expectations differed across race/ethnic groups (27).

The limitations of ERA-38, large number of items and the time required for completion, prompted the development of a shorter version, ERA-12. The 12-Item Expectations Regarding Aging Survey support three 4-item sub-scales (expectations about physical health, expectations about mental health, and expectations about cognitive function). The revised instrument, in contrast to ERA-38, does not attempt to show positive or negative conditions (28).

Since the risks of hospitalization or mortality resulted COVID-19 are higher in older adults than in young adults, the use of preventive approach in this group is more emphasized. An approach which is relatable to their view of aging and expectation regarding aging. The attitude adopted by older adults with concerns about COVID-19 can be seen from two perspectives. Firstly, a prescribed isolation may result in older adults feeling lonely or alternatively, Alternatively, the prescribed isolation may result in them feeling safe and more positive (29). If the expectations regarding aging remained relatively stable, a higher resilient was expressed in facing COVID-19 (30).

In justifying the use of ERA-12, it is noted that this instrument showed acceptable validity and reliability when applied to a sample of middle aged Singaporeans, middle aged Koreans and elderly women (31,

32). The focus of the present study is driven by two important considerations, (1) the increase in the elderly population as a vulnerable group in Iran, and (2) insufficient resources on aging expectations among Iranians which is key in developing informed and effective policies in this area. The present study, therefore, aims to evaluate the construct validity and reliability of Persian version of the 12-Item Expectations Regarding Aging Survey among an Iranian older adult population during COVID-19 pandemic.

Methods

Design

A methodological cross-sectional approach is adopted to evaluate the psychometric properties and the feasibility of a Persian version of the “ERA-12”. The sample consist of Iranians older adults aged above 65 years, fluent in Persian and residing in Tehran. Additionally, the respondent’s criteria to participant in this study include the use of social networks and informed consent is provided to be participated in this study.

Measures

There were two sections to the questionnaire. First section captures the demographics of the respondents. The following section contains items from the ERA-12 instrument to capture expectations on physical health, mental health, and cognitive function (28) of the elderly in Iran. All items assessing respondents’ expectations to aging applies a 4-point Likert scale to be consistent with the original study by Sarkisian et al. (2005).

Procedure

Translation

The original ERA-12 instrument developed in English needed to be translated and revised for the Iranian respondents. In order to develop the Persian version of this scale, firstly, a written approval was obtained from *Catherine Sarkisian*, the developer of the original scale. Upon obtaining the approval, two independent English-Persian translators worked on translating the items. Subsequently, both the translated versions were checked and evaluated by a group of experts (including some of this paper’s authors (H.SH and L.H)). In the final process, two professional translators proceeded to create a single Persian version of this questionnaire. All of their professional suggestions were included in the translations.

Construct Validity and Reliability Assessment

In this study, we randomly divided the dataset into two parts to examine the construct validity and reliability. First, the maximum likelihood exploratory factors analysis (EFA) with Varimax rotation was conducted using the first dataset ($n = 200$). The Kaiser–Meyer–Olkin (KMO) measure of sampling

adequacy test and the Bartlett's test of sphericity were used to ensure the adequacy of the sampling and suitability of the data for conducting factor analysis. Extraction of factor structure was referring the criteria of (1) eigenvalues > 1; (2) communalities > .3, and (2) scree plots (33-35). Next, we conducted the maximum likelihood confirmatory factor analysis (CFA) in accordance with the factor structure obtained from the EFA using second dataset ($n = 200$). The assessment of model fit was based on several fit indices such as Chi-square (χ^2) test, Chi-square/degree of freedom ratio (χ^2/df) < 4, goodness-of-fit index (GFI) > .90, comparative fit index (CFI) > .90, incremental fit index (IFI) > .90, normed fit index (NFI) > .90, Tucker–Lewis index (TLI) > .90, relative fit index (RFI) > .90, root mean square error of approximation (RMSEA) < .08, and standardized root mean square residual (SRMR) < .09 (36). Moreover, construct validity was assessed through convergent validity and discriminant validity. To achieve convergent validity of the construct, Average Variance Extracted (AVE) should be greater than .5 and composite reliability (CR) should be greater than .7 (37). In this study,, we used the Heterotrait-monotrait ratio of correlations (HTMT) in assessing the discriminat validty and all values of the HTMT matrix should be less than .85 (38).

The reliability of the Iranian version of ERA-12 was examined through its internal consistency (Cronbach's alpha and McDonald's omega), composite reliability (CR), and maximal reliability (MaxR). Cronbach's alpha and McDonald's omega of higher than .7 are considered as acceptable internal consistency, CR and MaxR should be greater than .7 to demonstrate satisfactory reliability (37, 39).

Multivariate Normality and Outliers

We tested both univariate and multivariate distributions in this study. The outliers, and the values of the skewness and kurtosis were determined and tested for univariate distributions. In terms of multivariate distributions, Mardia's coefficient of multivariate kurtosis was used to check the multivariate normality, the result of Mardia's coefficient was greater than .8 indicating deviation of multivariate normality (40). Also, Mahalanobis distance was used to identify the Multivariate outliers, and multivariate outliers can be identified through a Mahalanobis distance of $p < .001$ (41).

Ethical Considerations

The Ethics Committee of Mazandaran province, north of Iran approved the Ethical Considerations of this study (Code: IR.MAZUMS.REC.1399.6682). Additionally, we notified all participants regarding the aim and procedures of current study. The participation in this study was voluntary, where informed consent was acquired before participating in this study from all participants. In reporting the findings, the study ensured that the anonymity of the individuals' information was maintained.

Results

Profiling of Respondents

The sample of this study consists of 242 (60.5%) males and 158 (39.5%) females with the mean age of 71.32 (SD \pm 6.09) year. Majority of the participants were married (82.75%) university graduates (55.25%) with good economic status (56.75%). The details of this results have been shown in Table 1.

Reliability and Validity

The results of the maximum likelihood EFA with varimax rotation on Persian version of the EARS are shown in Table 2 based on the first dataset ($n = 200$). The results showed that there are three factors are extracted in explaining of 65.764% of the total variance, containing 11 items. One item was excluded because of low factor loading ($< .5$). The result of KMO test was .874, and the Bartlett's test of sphericity was significant ($p < .001$, 995.472, $df = 66$), indicating the adequacy of the sampling and appropriateness of the data to conduct factor analysis. See details in table 2 and figures 1.

Next, we performed maximum likelihood CFA using the second dataset ($n = 200$) to ensure and validate the factor structure extracted from EFA. Figure 2 shows the final measurement model, three sets of measurement errors (between item 7 and 8, item 9 and 10, and item 9 and 12) were free to covary to adjust the initial measurement model in a better fit according to modification indices. The results showed that after reviewing the model modification indices, the revised three factors model fits the data well, as evidenced by goodness-of-fit indices ($\chi^2(38) = 77.272$, $p < .05$, $\chi^2/df = 2.033$, GFI = .967, CFI = .981, NFI = .963, IFI = .981, RFI = .947, TLI = .972, SRMR = .028, RMSEA (90% C.I.) = .051 [.043, .067]), and factor loadings for all items were more than .6 and significant. Moreover, as presented in Table 3, the result of Cronbach's alpha (ranged from .788 to .845), McDonald's omega (ranged from .791 to .845), CR (ranged from .772 to .846), and MaxR (ranged from .781 to .863) were all greater than .7 revealing satisfied internal consistency and reliability. Also, the results indicated that AVEs of all three factors were more than .5 and less than their respective CR, demonstrating convergent validity. In terms of discriminant validity, all values in the HTMT matrix analysis were smaller than .85, indicating discriminant validity established all for constructs (Table 4).

Discussion

The analysis of psychometric properties of the ERA-12 Persian version carried out on a sample of older adults Iranians based on CFA indicated a three-factor solution of the Expectation Regarding Aging Survey has a good fit after one item was dropped (item 5: *I expect that as I get older, I will spend less time with friends and family*). The modified model including covariances between three factors (physical health, mental health, and cognitive functions) with total of 11 items showed an improved fit. The findings of the current study demonstrate an acceptable level of reliability, as indicated by good item discrimination scores and Cronbach's alpha values of the ERA-11. An outcome that is supported by previous findings on the three factors solution to the Expectations Regarding Aging questionnaire (31, 42). The findings of a systematic review of existing ageism scales showed that among 11 scales included in the study, only the

Expectations Regarding Aging Questionnaire had adequate ratings on the psychometric properties (43). Despite the mentioned finding, the authors have concluded that none of the available ageism scales have both adequate scope and psychometric validity(43). Considering the three dimensions of ageism that include stereotypes (cognitive component), prejudice (emotional component), and discrimination (behavioral component) (44), the ERA concerns to assess the stereotypes(43).

In justifying the removal of item 5 from the final ERA Persian version, several factors were considered. According to Yao (2020), some factors such as personal values and traits, role models of aging, personal experiences with growing older, and stereotypes about older adults influence on subjective aging. In addition, subjective aging is also influenced by cultural values and social interaction (45) allowing the present study to draw parallels with the cultural values of Iranians, specifically the elder adults' position within the family. Although socio-economic changes have impacted family institution during the last decades, the Iranian families have preserved many of their traditional values, specifically a support system for family members and respect for elder adults. The cultural value system has ensured Iranians maintain a strong relationship with their elderly parents after marriage, including providing care and support for them. Given the contextual sensitivity of subjective age, culture can be considered as the moderator variable in the relationship between views of aging and subjective age (46).

The findings indicate that expectation regarding aging is attributable to physical and mental health, in addition to elder adults' cognitive function that is congruent with the existing knowledge. ERA plays an essential role in implementation of physically active lifestyles for older adults, influencing health conditions, such as physical functions (15). In addition, positive ERA provides social support through network of friends (19), which improves quality of life (47), leading to a positive influence on elderly peoples' mental health (48). Conversely, negative age stereotypes, highlights higher instances of developing psychiatric conditions and impaired coping skills (49). Studies have also noted a deficit in cognitive functioning among negative age stereotypes (50, 51).

Our results also demonstrated three pairs of measurement errors. Firstly, between item 7 (*as people get older, they worry more*) and item 8 (*its normal to be depressed when you are old*). Next, between item 9 (*I expect that as I get older, I will become more forgetful*) and item 10 (*It's an accepted part of aging to have trouble remembering names*). Finally, between item 9 and item 12 (*It is impossible to escape the mental slowness that happened with aging*). The findings indicate a semantic equivalence between worrying and depressing symptoms among older Iranians. Semantic equivalence is also observed between trouble remembering, being forgetful, and mental slowness. In order to minimize the response burden and increase response rate among older people, shorter questionnaires maybe a possible solution (31). However, further investigations are needed before shortening the next Persian version of the ERA. On the component of age-related health changes among the Iranians, the findings reveal high priority for economic elements such as health insurance and income (52, 53). Iranian older people expect that they face by a range of age-related health changes such as memory deficit, to have trouble in remembering names (54), or depressive symptoms(55, 56).

Implication

Base on evidence, the expectation regarding aging contributes to physical and mental health and cognitive function in elder adults. Therefore, the positive ERA improves older adults' life quality. It is a suitable scale for assessing ERA of older adults and improving target interventions to improve their conditions. It can be used for aging, educational, and clinic research to develop and evaluate on suitable intervention to enhance the quality of life among Iranian aging population.

Study limitations

This study, however, not without limitation. The sample respondents are from one geographical urban location, Tehran. It is likely, respondents from other regions may have responded differently. As such, a broad generalization of the results to the rural population maybe not be applicable. The efficacy of the Persian ERA can be strengthened by replicating this psychometric testing in other settings and by including comparison with other indicators of aging expectation.

Conclusion

The present study provides the appropriate Persian version of ERA-11 among Iranian elder adults that can detect and distinct three dimension of ERA in this age group. But the remarkable thing is that this scale can identify the Cognitive Function more powerfully than the Physical and Mental Health in this population.

Declarations

Ethics approval and consent to participate

In this study, the ethical points of the Helsinki Declaration were observed, including informing all participants of the objectives and procedures of this study, ensuring the voluntary participation of the study, anonymity of the participants, and obtaining informed consent from all participants.

Consent for publication

Not applicable

Availability of data and materials

The datasets generated and analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors did not have any competing of interest in this work.

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Not applicable

Authors' contributions

HSN and LH designed the study and collected the data and drafted the manuscript. LS analysed the data and contributed to the interpretation of the result and writing the result . FKF and OK contributed to the interpretation of the result and writing the manuscript. All authors read and approved the final manuscript.

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Author Details

¹ Associate Professor, School of Nursing and Midwifery Amol, Mazandaran University of Medical Sciences, Sari, Iran

² Faculty of Business and Law, Taylor's University, Subang Jaya, Selangor, Malaysia.

³ Assistant Professor In Nursing, School Of Nursing And Midwifery, Tehran University Of Medical Science, Tehran, Iran.

⁴ Assisstant Professor, Phd Of Nursing, Mazandaran University Of Medical Science, Sari, Iran.

⁵ School of Nursing and Midwifery, Iran University of Medical Sciences, Tehran, Iran

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Tables

Table 1 Demographic Profile

Variables	n (%)	Variables	n (%)
Gender		Number of Child	
Male	242 (60.50)	None	44 (11.00)
Female	158 (39.50)	One	42 (10.50)
Marital Status		Two	132 (33.00)
Single	29 (7.25)	Three	90 (22.50)
Married	331 (82.75)	Four and more	92 (23.00)
Divorced	13 (3.20)	Employment Status	
Widow	27 (6.80)	Unemployed	24 (6.00)
Education Level		Manual worker	7 (1.75)
Illiterate	18 (4.50)	Retired	172 (43.00)
Elementary	51 (12.75)	Employed	98 (24.50)
Middle School	30 (7.50)	Housewife	56 (14.00)
High School	80 (20.00)	Free	43 (10.75)
University	221 (55.25)	Lifestyle	
Economic Condition		Along	44 (11.00)
Worse	44 (11.00)	With wife	74 (18.50)
Medium	129 (32.25)	With wife and children	256 (64.00)
Good	227 (56.75)	With relatives	26 (6.50)
Living address			
Personal home	385 (96.25)		
Children home	14 (3.5)		
Nursing home	1 (0.25)		

Table 2 The result of EFA on the three factors Iranian version of ERA (N = 200)

Factor	Items	Factor loading	<i>h</i> ²	λ	% Variance
Physical Health	2.The human body is like a car: when it gets old, it gets worn out.	.737	.622	2.162	19.656
	3. Having more aches and pains is an accepted part of aging.	.628	.549		
	4.Every year that people age, their energy levels go down a little more.	.588	.478		
	1.When people get older, they need to lower their expectations of how healthy they can be.	.547	.374		
Mental Health	8.It's normal to be depressed when you are old.	.657	.668	1.054	9.581
	7. As people get older they worry more.	.601	.517		
	6.Being lonely is just something that happens when people get old.	.512	.518		
Cognitive Function	11. Forgetfulness is a natural occurrence just from growing old.	.840	.843	4.018	36.527
	10. It's an accepted of aging to have trouble remembering names.	.629	.550		
	12.It is impossible to escape the mental slowness that happens with aging.	.599	.589		
	9. I expect that as I get older I will become more forgetful.	.552	.452		

Table 3 Internal consistency, construct reliability, and convergent validity of Iranian version of ERA (N = 200)

Factors	Cronbach's alpha	McDonald's omega	CR	MaxR	AVE
Physical Health	.788	.791	.800	.809	.501
Mental Health	.789	.793	.772	.781	.531
Cognitive Function	.845	.845	.846	.863	.581

Table 4 Discriminant validity assessment using HTMT matrix

Factor	Physical Health	Mental Health	Cognitive Function
Physical Health			
Mental Health	0.780		
Cognitive Function	0.599	0.830	