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Study of validity and reliability of the scale regarding the expectations about aging

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Abstract

Purpose: This study aimed to examine the validity and reliability of the Survey on Expectations about Aging in the Turkish society.

Methods: This is a methodological study and was performed on 120 people older than 65 years who live in Balçova County in Izmir. Data were collected using a demographic data collection form and the Expectations Regarding Aging (ERA-12). Content validity of ERA-12 was assessed via Kendall W analysis. Item-to-total score analysis was determined using Pearson Correlation. Internal consistency was used Cronbach's Alpha. Confirmatory factor analysis was used to assess construct validity.

Results: The Cronbach's Alpha coefficient was 0.76 for the total scale and 0.51 for physical health subscale, 0.48 for mental health subscale, 0.75 cognitive function subscale. Item-total score correlations were found to be 0.36–0.69 and at a statistically significant level.

Conclusions: The Turkish version of the ERA-12 is a reliable and valid instrument to measure expectations regarding aging.

Key words: Aged, Psychometrics, Expectations of aging

Introduction

As well as the progress in health and social areas in the developed and developing countries within the last 25-30 years, the levels of fertility and death rates decreased, length of life extended and this caused the gradual increase of the elderly population all around the world (Er,2009; State Planning Organization, 2007).

The World Health Organization estimates that the number of people over 65 years of age will be about 800 million by 2025. Moreover, an increase of approximately 300 % is expected for the elderly population, primarily in Latin America and

Asia, within the next 30 years. Additionally, while the rate of the younger population is expected to show a decline, the elderly population will double (World Health Organization [WHO], 2009). In Turkey; according to census data from 2008 6.8% of the population is over 65 years of age. (Turkish Statistical Institute [TUIK], 2008). Increases in the elderly population bring with it problems regarding healthcare.

There are numerous studies indicating that older adults elder individuals believe that changes in their health conditions are related to aging aging (Sarkisian, Hays, Berry, Mangione, 2002; Sarkisian, Lee-Henderson, &Mangione, 2003; Kim 2008; Levy, Slade, Kasl, &Kunkey, 2002; Weltzien, 2007). As a result of this thinking, many older adults simply accept their disease symptoms, refuse to seek medical help or to use preventive methods. In some cases, these misconceptions can cause deterioration in their health statush (Sarkisian, Shungkwiler, Aguilar,& Moore, 2006).

In studies on this subject, individuals over 50 years of age who have positive perceptions about aging have a lower probability of death or disease, while persons with lower expectations about aging lead a more sedentary life and have lower usage rates of health services in conditions associated with aging (Sarkisian, et al., , 2002; Sarkisian, Prohaska, Wong, Hirsch, &Mangione, 2005).

Considering the importance of expectations of older adults regarding aging for health conditions and health behaviors, Sarkisian, Hays, Berry, and Mangione (2002) developed a valid and reliable instrument, the ERA 38, for determining the expectations of elders. This scale is consisted of 38 items. Cronbach's alpha for the 38-item version of the scale is 0.80. It has 11 subscales as the general health, cognitive function, mental health, functional independence, sexual function, pain, sleep, fatigue, urinary incontinence and appearance (Sarkisian, Hays, Berry, &Mangione, 2002). Since some of the item

of subscales of the scale were inadequate, Sarkisian et al. reduced the 38 item "Scale of Expectations about Aging" to a 12 item scale, to enhance practicability. Cronbach's alpha for the 12-item scale, was also 0.80. The abbreviated scale consisted of three factors: physical health, mental health and cognitive function (Sarkisian, Prohaska, Wong, Hirsch & Mangione, 2005).

In a study that examined the effect of ethnic differences in expectations about aging (Sarkisian, Shungkwiler, Aguilar, & Moore, 2006) the researchers used the, ERA. As a result of this study, the expectations of the Latin group living in the Los Angeles area regarding aging were determined to be lower, compared to non-Latin whites and African-Americans. The difference was attributed to educational level and the researchers recommended that clinicians working with older individuals with lower educational levels take intercultural differences into consideration (Sarkisian, Shungkwiler, Aguilar, & Moore, 2006). Kim (2008) used the short form (12-item) of the 'Expectations about Aging' scale to evaluate the relationship between the expectations of N=99 older individuals, age 60 and above, about aging and health-promoting behaviours. Findings emphasized that older persons with high expectations about aging have healthier life styles, with implications for future health. Other studies revealed that expectation individuals about aging are strongly related to their state of health (Levy, Slade, Kasl, & Kunkey, 2002; Weltzien, 2007).

In his study evaluating the health behaviors and aging expectations of individuals using the ERA 12 scale, Weltzien (2007) determined that older women have more negative attitudes compared to younger ones and that younger women have more positive health expectations and inner control, as well as a better state of health.

A psychometrically sound instrument that surveys the expectations of elders about aging enables researchers to examine the relationship between the expectations about aging, health behaviors, service usage and health status in a reliable way. Assessment instruments could be used to determine whether the older adults have low expectations about the aging process and whether or not these expectations prevent them from availing themselves of appropriate health services.

The Survey on Expectations about Aging is a preferred instrument to capture expectations about aging, and has been widely used in research as in English. However, this scale must be adapted for use in Turkish language and Turkish society. Although some of the attitudes toward aging are common across many societies, the tests that are developed in a certain culture and language reflect the qualities of understanding, conceptualization and sample that are peculiar to that culture and language. Thus the same test must be systematically examined, in order to be practicable and significant in other cultures and languages (Ercan & Kan 2004; Gözümlü & Aksayan 2002; Karasar, 2000).

Therefore, this study aimed to examine the validity and reliability of the 'Survey on Expectations about Aging' in Turkish society for possible use in future studies.

Methods

Design and Sample

Written permission was obtained from Catherine A Sarkisian to adapt the Expectations Regarding Aging Scale (ERA-12) into Turkish and to use the instrument in this psychometric study. The University of Dokuz Eylül's Ethical Committee reviewed and approved this study for the protection of human subjects. Written approval to conduct the study was obtained from the Izmir Provincial Directorate of Health. Informed consent was obtained from all study participants.

The sample for this psychometric study included 120 people age 65 and older years that live in Balçova County in Izmir. Inclusion criteria for study participants included: a) ability to speak and understand Turkish, b) willingness to participate in the study, c) no hearing or speaking problems, and d) age 65 years and older. Participants' ages ranged from 65 to 86 years with a mean of 71.68 (SD 5, 37). Of the participants, 46 % were male and 54 % female.

Instruments

Data were collected using a demographic data collection form and the Expectations Regarding Aging Scale 12-item version (ERA-12).

Expectations Regarding Aging (ERA-12)

As noted previously, the ERA-12 developed by Sarkisian et al. to measure the expectations of older adults regarding aging. Expectations Regarding Aging (ERA-12) is a shortened survey and contains twelve items. ERA-12 is a summed Likert scale ranging from 1 (Definitely True) to 4 (Definitely False) (Sarkisian, et al., 2005). Scoring for the ERA-12 Survey with 4 items for each of 3 subscales is as follows: physical health (1-4 items), mental health (5-8 items), and cognitive function (9-12 items). Scores obtained from items of each scale are added and four is subtracted from this score. The obtained number is multiplied by 25 and then divided by three. A score between 0-100 is obtained for each subscale. For the whole scale, scores obtained from all items are added, 12 is subtracted from this number and the obtained number is multiplied by 25 and divided by nine. At the end of these mathematical operations, a score between 0-100 is obtained. Higher scores indicate higher expectations regarding aging. Lower scores indicate lower expectations regarding successful aging. Reliability and validity of the original version of the 12 item scale have been studied by Sarkisian, et al., (2005) yielding a Cronbach's alpha of .79 for the Physical Health subscale, .73 for the Mental Health subscale, .81 for the Cognitive Function subscale, and .89 for total ERA-12.

Procedures

Translation of the Scale Items into Turkish

The first step of the translation involved forward translation of the original ERA-12 into Turkish by six native speakers of Turkish who spoke English fluently. Turkish versions of the scale were reviewed by the researchers, whose native language was Turkish, and then drafted one Turkish version of the ERA-12. To ensure the accuracy of the translation, the forward-translated version was then back-translated by a professional bilingual translator unfamiliar with either the English or the Turkish version of the ERA-12. The authors of this paper then compared the back-translation with the original ERA-12. If the items or response choices in the forward translated and back-translated instruments did not agree, the choice of words was discussed among the translators until consen-

sus was reached on a final version (Karasar, 2000; Gozum & Aksayan, 2003).

Content validity

Based on the principle that the items of the Turkish form of the inventory should be equivalent to those of the original form, the Turkish form was submitted, along with the original form, for assessment by ten experts (1 family physician, 8 faculty members of a nursing school, 1 clinical nurse) who had a good command of English. The items of the inventory were assessed by these experts in terms of understandability, explicitness, simplicity and conformity to aim and culture and they were scored between 1 and 4 (1=not appropriate, 2=the item should be made appropriate, 3=It is appropriate but needs only small changes, 4=considerably appropriate). Concordance levels of the expert opinions were examined using non-parametric Kendall W analysis. Content validity of the ERA-12 was also assessed via Kendall W analysis of assessment scores given by experts to all items. There were no statistical differences between scores given by the experts for each item (for ERA-12 Kendall W=.076; $p = .68$) and the experts achieved consensus concerning all items. Thus, no item was excluded from the inventory. After language and content confirmations, a pilot study was conducted with 10 individuals conforming with the sampling criteria and the inventory took its final shape. Pre-application data were not used in the research reported here.

Data collection

Informed consent forms and questionnaire were given to participants by one of the researchers during a home visit. After obtaining written informed consent, questionnaire was administered by the researchers. Data were collected over a period of four months, from May to August 2011. Participants, on average, took 5-10 minutes to complete the questionnaire. The researchers answered any questions and queries from participants.

Data analysis

Analysis was conducted using descriptive statistics and appropriate reliability and validity statistical tests using the Statistical Package for the Social Services SPSS 15.0 (SPSS Inc. Chicago IL date).

An expert panel was convened to evaluate content validity of the ERA-12. Using the Kendall W statistic, concordance of expert opinions' was tested. Item-to-total score analysis was determined using Pearson Product Moment? Correlations and internal consistency was determined using Cronbach's alpha. Confirmatory factor analysis was used to assess construct validity. Indices to evaluate to degree to which to data fit the model were: χ^2 statistics, the ratio of chi-square to degree of freedom (χ^2/df), the non-normed fit index (NNFI), the root mean square error of approximation (RMSEA), the standardized root-mean-square residual (SRMR) and the comparative fit index (CFI) (Harrington, 2009; Lobiondo & Haber, 2002; Simsek, 2007).

Results

Descriptive statistics of the ERA-12

Descriptive data for each item of ERA-12 are shown in Table 1. The minimum and maximum scores for each item except the second item of the subscale, were one and four, respectively. The minimum and maximum scores for second item was one and three. The mean value of the items ranged from 1.25 (SD 0.54) – 2.67 (SD 1.03). The total scores ranged from 0- 72.22 with a mean score of 26.42 (SD 15.67). The physical health subscale mean scores ranged from 0-83.33 with a mean score of 18.26 (SD 16.32), the mental health subscale mean scores ranged from 0-83.33 with a mean score of 41.52 (SD 22.46), the cognitive function subscale mean scores ranged from 0-100 with a mean score of 19.30 (SD 20.44).

Validity analysis

Construct validity

Confirmatory factor analysis showed that there was a statistically significant correlation between the physical health subscales and mental health subscales ($r = 0,93$; see Figure 1), mental health subscales and cognitive function subscales ($r = 0,54$; see Figure 1), physical health subscales and cognitive function subscales ($r = 0,57$; see Figure 1). Factor loading of physical health subscale was 0.27-0.68, mental health subscale was 0.38-0.52, cognitive function subscale was 0.37-0.96 (see Figure 1). The model concordance indicators were

found to be: χ^2 80.51 ($p < .10$), RMSEA 0.062, CFI 0.94, SRMR 0.075 and NNFI 0.92.

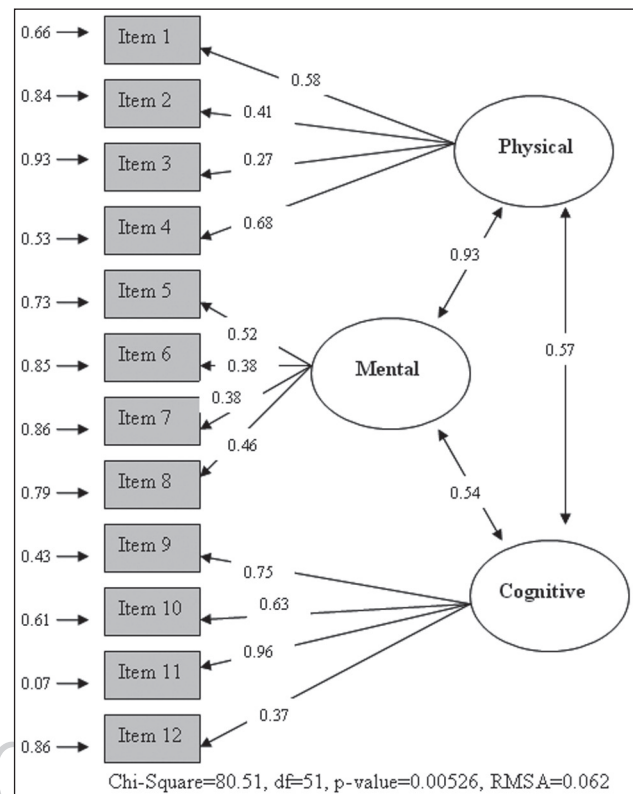


Figure 1. ERA-12's Confirmatory Factor Analysis Model

Reliability

The Cronbach's alpha coefficient was 0.76 for the total scale and 0.51 for physical health subscale, 0.48 for mental health subscale, 0.75 cognitive function subscale. When the 12-item scale's item-total score correlations were examined to assess instrument reliability, item-total score correlations were found to be 0.36–0.69 and at a statistically significant level ($p < .001$; see Table 1).

Discussion

For an instrument is to be used in a different language it is necessary to demonstrate that it has similar validity and reliability as the original instrument (Patrick & Beery, 1991; Tezbasaran 1997; Sencan 2005). We therefore evaluated the validity and reliability of the ERA-12 for use in a Turkish population. The results of this study support the reliability and validity of the ERA-12 to assess expectations of older people regarding aging in Turkey.

Table 1. Descriptive statistics of ERA-12 and Pearson correlation coefficient between the items and the total scale (n=120)

Item	Item content	M	SD	r	p
1	When people get older, they need to lower their expectations of how healthy they can be.	2.06	1.02	.58	.001
2	The human body is like a car: when it gets old, it gets worn out.	1.25	0.54	.41	.001
3	Having more aches and pains is an accepted part of aging.	1.54	0.52	.36	.001
4	Every year that people age, their energy levels go down a little more.	1.36	0.61	.62	.001
5	I expect that as I get older I will spend less time with friends and family.	2.38	1.14	.57	.001
6	Being lonely is just something that happens when people get old.	2.63	1.10	.47	.001
7	As people get older they worry more.	1.80	0.89	.49	.001
8	It's normal to be depressed when you are old.	2.67	1.03	.53	.001
9	I expect that as I get older I will become more forgetful.	1.57	0.89	.60	.001
10	It's an accepted part of aging to have trouble remembering names.	1.68	0.82	.49	.001
11	Forgetfulness is a natural occurrence just from growing old.	1.54	0.73	.69	.001
12	It is impossible to escape the mental slowness that happens with aging.	1.53	0.81	.55	.001

Validity

Confirmatory factor analysis is a method used to evaluate whether or not the items are adequately represented in subscales, whether or not the defined subscales adequately explain the scale's original construct and to evaluate whether or not a factor's items' relationships with the factor are adequate (Patrick & Beery, 1991; Sencan, 2005; Simsek, 2007). Additionally, confirmatory factor analysis is used to determine evidence of validity for use of an instrument in a different culture (Buyukozturk, 2002). Results of the subscales of ERA-12 confirmatory analysis factor loading of physical health subscale was 0.27-0.68, mental health subscale was 0.38-0.52, cognitive function subscale was 0.37-0.96 (see Figure 1). The recommendation is that factor loads must be above 0.30. Thus for the ERA-12 confirmatory analysis the scale factor loadings were adequate and consistent with the model. RMSEA values near or below 0.08 point out close fit (Simsek, 2007; Harrington, 2009). In this study the RMSEA value was 0.05, indicating data are consistent with the model. SRMR values below 0.10 CFI and NNFI values close to or higher than 0.90 are indicative of a good fit (Harrington, 2009). In this study SRMR, CFI and NNFI values pointed out a good fit. These results support the construct validity of Turkish version of the ERA-12 and that the instrument is valid for use in the Turkish culture.

Reliability

Reliability is the consistency between independent measurements of the same thing. Following the same procedure, using the same measurement methods and obtaining the same

results means that the measurement is free from random errors (Salkind, 2008). The ERA-12 scale and subscales demonstrated acceptable internal consistency. The Cronbach's alpha coefficient was 0.76 for the total scale and 0.51 for physical health subscale, 0.48 for mental health subscale, 0.75 cognitive function subscale. The Turkish version's Cronbach's alpha value was larger than for Singaporeans (0.7) (Joshi, Malhotra, Lim, Ostbye, & Wong, 2010). The total scale and subscales were reliable for internal consistency. To determine the degree to which an instrument's items are associated with the entire instrument, the correlation coefficient of item analysis was used (Tezbasaran, 1997; Sencan, 2005). Getting a high correlation coefficient for each item demonstrates that item is highly connected with the theoretical construct being measured, or that the item is influential and adequate to measure the targeted behavior. It is suggested that the item coefficient be higher than 0.20 or 0.25 (Patrick & Beery, 1991; Tezbasaran, 1997; Sencan, 2005). The item-total score correlations for the ERA-12 using correlation coefficients (Pearson's Product-Moment Correlation) were 0.36-0.69 ($p < .001$; see Table 1), for the physical health subscale were 0.36-0.62, the men-

tal health subscale were 0.47-0.53, the cognitive function subscales were 0.49-0.69 ($p < .001$), and statistically significant. All of the items of the ERA-12 demonstrated adequate correlations with their own subscale's total score and the subscales' item reliability was high ($p < .001$). The item-total score analysis is as much a confirmation of reliability as it is an indication of validity (internal consistency) displaying the scale's construct validity as well (Tezbasaran, 1997; Sencan, 2005).

Conclusion and Clinical Nursing Implications

The Turkish version of the ERA-12 is a reliable and valid instrument to measure expectations regarding aging. The psychometric properties of the original version of the ERA-12 were preserved. Psychometric analysis of the Turkish version of ERA-12 indicates high reliability (internal consistency) and good content and construct validity.

Relevance to clinical practice This study provides evidence that the Turkish version of the ERA-12 is a reliable and valid instrument for assessing expectations of older people regarding aging. It is easy and practical to use for both informants and investigators and appropriate for the Turkish Culture and Turkish language. Turkish version of ERA-12 can use for all people who speak Turkish in the world. In this way it will facilitate cross-cultural comparisons and culture-oriented care planning.

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