

# Validity and reliability of the Philadelphia Geriatric Center Morale Scale among Turkish elderly people

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## Abstract

**Purpose** We translated the original 17-item Philadelphia Geriatric Morale Scale (PGCMS) into Turkish and examined its validity and reliability to determine whether it may be used as a tool to measure quality of life (QOL) in a Turkish elderly sample people.

**Methods** The sample included 398 participants aged 65 years living in institutions. Participants who were cognitively impaired (Abbreviated Mental Test score less than 7) or who could not answer questions for other reasons were excluded. Preliminary analysis was conducted to investigate multicollinearity, univariate and multivariate outliers, normality, item difficulty and discriminatory power of individual items. Confirmatory factor analysis (CFA) was used to test the structure of the PGCMS. By means of convergent–divergent validity, correlations between PGCMS and Turkish SF-36, correlations between PGCMS and social support scores, and correlations between PGCMS and hopelessness scores were investigated. Reliability was based on internal consistency investigated by Kuder-Richardson-20 (KD-20) and item-total correlation.

**Results** By means of multicollinearity, we deleted two items. Neither univariate nor multivariate outliers were found. No items showed skewness and kurtosis value greater than recommended. A model containing 15 of the PGCMS items was found to fit Turkish data perfectly. We identified three underlying factors including agitation, attitude toward own aging, and lonely dissatisfaction similar to original PGCMS's three-factor solution. There were strong correlations between PGCMS's subscales. The correlations with the physical and mental domain in SF-36, correlations between PGCMS and social support, and correlation between PGCMS and hopelessness supported construct validity. We found satisfactory evidence of internal consistency (KD-20 was 0.92 for total PGCMS and it ranged from 0.76 to 0.85 for subscales in the PGCMS) with item-total correlations ranging from 0.39 to 0.73.

**Conclusions** The PGCMS is a valid and reliable quality of life measure in elderly Turkish people.

**Keywords** Philadelphia Geriatric Morale Scale · Quality of life · Reliability · Turkish · Validity

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## Abbreviations

A	Agitation
AGFI	Adjusted goodness of fit index
ATOA	Attitude toward own aging
BHS	Beck Hopelessness Scale
CFA	Confirmatory factor analysis
CFI	Comparative fit index
CI	Confidence interval
GFI	Goodness of fit index
LD	Lonely dissatisfaction
MCS	Mental component summary

MSPSS	Multidimensional Scale of Perceived Social Support
PCS	Physical component summary
PGCMS	Philadelphia Geriatric Center Morale Scale
RMSEA	Root mean square error of approximation
QOL	Quality of life
SD	Standard deviation
SF-36	Medical Outcomes Study MOS 36-Item Short Form Health Survey
SPSS	Statistical Package for Social Sciences

## Introduction

In the field of geriatric research and clinical practice, increasing attention has been paid to quality of life (QOL). The morale, life satisfaction, subjective, or psychological well-being has been often used as equal with QOL in various studies. However, these concepts are defined in different ways, and there are large overlaps in both the descriptions and their usage [1–3]. Although researchers disagree on the domains that make up QOL, the general consensus is that QOL measurement should focus on the subjective experience of the individual. One of the most commonly used assessments of subjective or psychological well-being or QOL in elderly subjects is the Philadelphia Geriatric Center Morale Scale (PGCMS) [2]. The questions in the questionnaire are easy to comprehend and reply, and calculate of scores. The PGCMS is applicable among elderly people in the community [1, 4–9] and institutions [2, 8, 10].

The United Kingdom's Royal College of Physicians and the British Geriatric Society [11] have recommended the scale as one of the standardized assessment scales for the elderly population. The use of a standardized assessment scale like PGCMS, developed in other countries for different ethnic and cultural groups, has the advantage of allowing comparison of different populations in international trials even though cultural adaptations, validity, and reliability studies are needed.

However, there have been relatively few studies examining the psychometric properties of the PGCMS or its validity as a QOL measurement tool [2, 4, 8, 12–14]. Moreover, the applicability of the PGCMS in the Turkish elderly population aged over 65 years (which constitutes 7.1% of the population according to 2007 National Census) [15] has not been examined.

In this study, we translated the original PGCMS into Turkish and examined its, construct validity, and reliability in a Turkish elderly sample to determine whether it may be used as a tool for the measurement of QOL.

## Methods

### Participants

We conducted the study according to the Helsinki Declaration and got approval by the Local Ethical Committee of the Marmara University. Sample eligibility criteria were to be Turkish, to be able to read and write in Turkish, and to be able complete the questionnaire. In addition, participants needed to be aged 65 and over. There were five elderly care institutions in Istanbul during our study (now 6). Participants were selected among elderly people living in five institutions. The institutions have a total of 672 beds and 623 out of 672 beds were occupied. We excluded 169 of them because 128 were at care unit because of their serious health problems or their need for terminal care and 29 were unable to write and read in Turkish, and 12 were cognitively impaired (evaluated by Abbreviated Mental Test) [16, 17]. Thus, 454 elderly people participated in the study. We distributed the questionnaires to the participants. Some people were able to self complete the questionnaire with some assistance from the researchers. The researchers read the questionnaire verbatim and did not make additional explanations. Incomplete questionnaires were discarded. As a result, there were 398 (88%) questionnaires to analyze. All participants were informed of the purpose of the study and were assured of confidentiality. Informed written consent was obtained from all subjects before their participation in the study.

### Instruments

#### *The Philadelphia Geriatric Center Morale Scale (PGCMS)*

The PGCMS [2] was designed to provide a multidimensional measure of morale, appropriate for elderly subjects living in institutions and also for those with limited competency. The PGCMS is now widely used as a measure of morale, psychological well-being, and QOL in elderly populations in both the community [1, 4–9] and institutions [2, 8, 10].

As seen in Table 1, it consists of 17 dichotomous items and three factors including agitation (A), attitude toward own aging (ATOA) and lonely dissatisfaction (LD). A includes 6 items, which characterizes the anxiety experienced by the older person. ATOA includes 5 items, which captures the individual's perception of the changes taking place in his or her life and asks for an evaluation of those changes. LD includes 6 items, which represents the older person's acceptance or dissatisfaction with the amount of social interaction they are presently experiencing. Three factors can be thought of as representing the dimensions of morale and they suggest categories of attitudes or feelings

**Table 1** The Philadelphia Geriatric Center Morale Scale

	Response options	Scoring of the response options/dimension	Possible min–max scores
Agitation			0–6
Item 4. Do little things bother you more this year?	Yes/No	0/1	
Item 7. Do you sometimes worry so much that you can't sleep?	Yes/No	0/1	
Item 12. Are you afraid of a lot of things?	Yes/No	0/1	
Item 13. Do you get mad more than you used to?	Yes/No	0/1	
Item 16. Do you take things hard?	Yes/No	0/1	
Item 17. Do you get upset easily?	Yes/No	0/1	
Attitude toward own aging			0–5
Item 1. Do things keep getting worse as you get older?	Yes/No	0/1	
Item 2. Do you have as much pep as you had last year?	Yes/No	1/0	
Item 6. Do you feel that as you get older you are less useful?	Yes/No	0/1	
Item 8. As you get older, are things better/worse than you thought?	Better/worse	1/0	
Item 10. Are you as happy now as you were when you were younger?	Yes/No	1/0	
Lonely dissatisfaction			0–6
Item 3. How much do you feel lonely?	Not much/a lot	1/0	
Item 5. Do you see enough of your friends and relatives?	Yes/No	1/0	
Item 9. Do you sometimes feel that life isn't worth living?	Yes/No	0/1	
Item 11. Do you have a lot to be sad about?	Yes/No	0/1	
Item 14. Is life hard much of the time?	Yes/No	0/1	
Item 15. How satisfied are you with your life today?	Satisfied/not satisfied	1/0	
Total			0–17

which, in combination, make up the more global psychological state. According to the administration and scoring instructions, each answer indicating high morale was scored with the numerical score of one, and answers indicating low morale and when the person could not answer were scored zero. Although there are no formal cutting points for interpreting scores, Lawton suggests that scores of 13–17 are high; 10–12 midrange and scores of  $\geq 9$  are at the low [2]. The scale has been found to be valid and reliable [2, 4, 8, 12–14].

#### *The Medical Outcomes Study MOS 36-Item Short Form Health Survey (SF-36)*

The SF-36, developed by Ware and Sherbourne [18], was designed for use in clinical practice and research, health policy evaluations, and general population surveys. The SF-36 is a 36-item questionnaire, and the items are assigned to eight scales: physical functioning, role–physical, bodily pain, general health, vitality, social functioning, role–emotional, and mental health. Two core components of health, (physical component summary–PCS; the mental component summary–MCS), can be derived from these

eight scales. There is also a single separate item that is used to assess any change in health from 1 year before. Subscale and final global scores for the SF-36 range from 0 to 100.

We chose the SF-36, because it is a well known and widely used instrument in QOL research. It is shown that it has established validity and reliability in numerous studies, languages, and groups, including elderly [19–23]. Haywood, Garratt and Fitzpatrick did a systematic research including 122 articles relating to 15 instruments to review evidence relating to the psychometric properties in older people. They found that there was good evidence for reliability, validity and responsiveness for the SF-36 [19]. Turkish version of SF-36 is also available [20].

#### *The Multidimensional Scale of Perceived Social Support (MSPSS)*

The 12-item MSPSS, developed by Zimet and his colleagues [24], provides assessment of three sources of support: family, friends, and significant others. The unique features of this scale have been argued elsewhere [25]. Eker and Arkar [26] did the MSPSS's Turkish adaptation, validity and reliability.

### The Beck Hopelessness Scale (BHS)

The BHS is developed by Beck et al. [27] and is designed to measure an individual's negative attitudes about the future. Three major aspects of hopelessness, feelings about the future, loss of motivation, and expectations can be measured by BHS. The total BHS score ranges from 0 to 20. The BHS was adapted into Turkish by Seber et al. [28].

### Procedures

The PGCMS was translated into Turkish in several steps, which included: (a) translation from English into Turkish by three bilingual translators familiar with both cultures and backward translation from Turkish into English by one independent translator; (b) examination by an expert panel of the original English, Turkish, and back-translation versions for clarity, discrepancies, and meaning errors; (c) resolution of all differences in meaning between translation and back-translation; (d) pre-testing of Turkish translation on a monolingual target language sample ( $n = 20$ ); (e) a revision of the Turkish PGCMS.

Translators were fluent not only in both languages but also closely familiar with both cultures. Translators were also knowledgeable about how the PGCMS would be used. In addition, they had specific information regarding translation methodology. Expert panel consisted of six health professionals including nurses, physicians, and a psychologist, with similar background to translators. The Turkish translation was tested first on a monolingual target language sample by asking each of the participants to read the items, one by one, and to paraphrase their understanding of the item. Open-ended questioning such as “What do you think this item means?” allowed the participants to express their understanding and to give the most reliable responses. Discrepancies were reviewed again and analyzed for translation misinterpretations and changes made to the translated version.

After entering 398 PGCMS into statistical data set, preliminary analysis were conducted to investigate multicollinearity, univariate and multivariate outliers, and normality. By means of multicollinearity, we deleted two items (“Do you have as much pep as you had last year?” and “Do you have a lot to be sad about?”) because bivariate correlation coefficients were above 0.90, which means these items actually measured the same thing. Otherwise further analysis would have been impossible [29].

We evaluated cases with standardized scores ( $Z$ ) in excess of 3.29 as potential univariate outliers. The criterion for multivariate outliers was Mahalanobis distance at  $p < 0.001$ . Mahalanobis distance was evaluated as  $\chi^2$  with degrees of freedom equal to the number of variables [29]; in this case it was 15. We accepted values greater than

$\chi^2(15) = 37.697$  as multivariate outliers. As a result, neither univariate nor multivariate outliers were found.

Normality of variables was assessed by skewness and kurtosis. A criterion for satisfactory skewness value was 3, recommended by Kline [29]. We found that skewness values had normal distribution except two items (14.26 and 12.34, respectively). We did not do any transformation because with reasonable large samples, skewness would not make a substantive difference in the analysis [30]. There is no consensus about the kurtosis index; however, absolute values from about 8.0 to over 20.0 of this index have been described as indicating “extreme kurtosis”. A conservative rule is that absolute values of the kurtosis index greater than 10.0 may suggest a problem. In our sample, no items showed a kurtosis value greater than 10.0 recommended by Kline [29], and this supports univariate normality in the items.

In addition, item difficulty and discriminatory power of individual items were investigated. In this study, the item difficulty referred to the percentage of the total number of correct responses to the test item. Discriminatory power of individual items was evaluated by discrimination index and Pearson's correlation coefficient [31].

The item discrimination index measures the difference between the percentage of participants in the upper group, who obtained the expected (correct) responses, and the percentage of those in the lower group, who obtained the expected responses. The higher the discrimination index, the better the item can determine the difference, i.e., discriminate, between those participants with high test scores and those with low ones [31]. As with all correlation indices, the Pearson's correlation coefficient ranges from  $-1.00$  to  $+1.00$ . A positive correlation coefficient means that those scoring higher on the PGCMS were more likely to answer the test item correctly (i.e., the item “discriminates” between high-scoring and low-scoring participants). Conversely, a negative correlation coefficient suggests that high scorers on the PGCMS answered the test item incorrectly more frequently than low scorers. A negative correlation coefficient suggests an unpleasant explanation—e.g., the item was keyed in incorrectly, the item was poorly constructed or misleading or the content of the item was inadequately taught. The higher Pearson's correlation for a test item is desirable, as a general rule,  $+0.20$  is acceptable. However, there is an interaction between item discrimination and item difficulty, we should be aware of the fact that very easy or very difficult test items have little discriminative power and the items of moderate difficulty are generally more discriminative [32].

In accordance with the aim of the study, the data was analyzed in two stages including construct validity and reliability.

Confirmatory factor analysis (CFA) on the tetracoric correlation among observed variables was used to test the

structure of the PGCMS. The fit of the model for the data was based on goodness of fit index (GFI), adjusted goodness of fit index (AGFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA). According to conventional criteria, a good fit would be indicated by  $GFI > 0.95$ ,  $AGFI > 0.90$ ,  $CFI > 0.97$ , and  $RMSEA < 0.05$ ; an acceptable fit by  $GFI > 0.90$ ,  $AGFI > 0.85$ ,  $CFI > 0.95$ , and  $RMSEA < 0.08$  [33]. The  $\chi^2$  statistic is the most common fit test but is almost always statistically significant for models with large samples. This analysis had a sample size of  $>200$ ; therefore, the  $\chi^2$  test was not viewed as an appropriate fit index for this study. Factor loadings were taken as the recommended minimum 0.30 [34]. The pattern of cross-scale correlations with 95% confidence interval (CI) was examined for each subscale to further examine the structure of the PGCMS as recommended by Fayers [35].

By means of convergent–divergent validity, we investigated correlations between PGCMS and the Turkish SF-36, correlations between PGCMS and social support scores, and correlations between PGCMS and hopelessness scores. We expected that there would be positive correlations between PGCMS and SF-36, PGCMS and social support, while there would be negative correlations between PGCMS and hopelessness. Pearson's correlation coefficient with 95% CI was used to correlate the scores with each other.

Reliability of the PGCMS-Turkish version was based on internal consistency and item-total correlation. Internal consistency was assessed by Kuder-Richardson 20 reliability coefficient. Nunnally and Bernstein [36] regarded a reliability coefficient of 0.90 as the minimum acceptable value for making decisions about individuals but noted that, for comparing groups, 0.80 is adequate and 0.70 is acceptable. Others consider that an acceptable minimum reliability coefficient can be 0.70–0.80, or even lower for short subscales [37]. In the present analysis, a minimum Kuder-Richardson 20 reliability coefficient of 0.90 was regarded as ideal, but reliability coefficients  $\geq 0.80$  were considered very acceptable and reliability coefficients  $\geq 0.70$  were considered acceptable. Item-total consistency was assessed by calculating correlation coefficients. Acceptable corrected item-total correlations were those  $\geq 0.20$  [34]. Data were analyzed using SPSS 15.0 for Windows [38]. The CFA was calculated using LISREL 8 [39].

## Results

The characteristics of the participants are shown in Table 2. The sample included 398 participants with mean age 75.6 years. The majority of participants were men,

**Table 2** Characteristics of the subjects

	<i>n</i>	%	Range	Mean	SD
Age			65–100	75.6	8.3
Gender					
Male	239	60.0			
Female	159	40.0			
Marital status					
Married	34	8.2			
Unmarried	364	91.5			
Educational level					
Primary school (5 years)	131	33.0			
Secondary school (8 years)	123	30.9			
High school (11–12 years)	98	24.6			
University (16 years and over)	46.0	11.5			
Social security					
Present	272	68.3			
Absent	126	31.7			
Self-perceived health status					
Poor	96	24.0			
Fair	153	38.5			
Good	119	30.0			
Very good	30.0	7.5			
Moral level					
Low	225	56.4			
Middle	72	18.2			
High	101	25.4			

*SD* standard deviation

unmarried, had primary school education level, and had social security. Sixty-two percent of those described their health status as poor or fair. More than 50% had low morale.

As shown in Table 3, item difficulties was between 0.33 and 0.83, and overall mean item difficulty coefficient was 0.47, which indicates that the items have moderate difficulty level. Discrimination index changed between 0.28 and 0.75 and overall mean discrimination index was 0.60, indicating that the items have a good discriminate coefficient. The Pearson's correlation coefficient for all items in the PGCMS was positive and exceeded 0.25. As a result, the PGCMS items had moderate difficulty level and demonstrated good discrimination. There was no ceiling and floor effect.

## Construct validity

### *Structure of the PGCMS*

We performed CFA to assess the structure of the PGCMS. Using the data from our sample, two models were tested. We first started with one-factor model. We found that GFI and CFI were both below the goodness of fit criterion;

**Table 3** Item Difficulty and Discriminatory Power of the PGCMS

Item no	Number correct	Item difficulty	Discriminatory index	Correct in high group	Correct in low group	Pearson's correlation	Adjusted Pearson's correlation
1. Keep getting worse (ATOA)	169	0.42	0.63	108 (0.74)	15 (0.11)	0.59 (CI = 0.52–0.65)	0.50 (CI = 0.42–0.57)
2. Feel lonely (LD)	167	0.42	0.53	97 (0.66)	19 (0.13)	0.48 (CI = 0.40–0.55)	0.38 (CI = 0.29–0.46)
3. Bother you more (A)	331	0.83	0.28	141 (0.97)	97 (0.69)	0.34 (CI = 0.25–0.42)	0.25 (CI = 0.16–0.34)
4. See enough friends and relatives (LD)	180	0.45	0.75	122 (0.84)	12 (0.09)	0.66 (CI = 0.60–0.71)	0.58 (CI = 0.51–0.64)
5. Feel less useful (ATOA)	156	0.39	0.63	102 (0.70)	9 (0.06)	0.61 (CI = 0.54–0.67)	0.52 (CI = 0.44–0.59)
6. Worry that you can't sleep (A)	167	0.42	0.71	115 (0.79)	11 (0.08)	0.63 (CI = 0.57–0.69)	0.55 (CI = 0.48–0.62)
7. Things better/worse than you thought (ATOA)	132	0.33	0.67	102 (0.70)	4 (0.03)	0.68 (CI = 0.62–0.73)	0.60 (CI = 0.53–0.66)
8. Feel life isn't worth (LD)	182	0.46	0.75	121 (0.83)	11 (0.08)	0.67 (CI = 0.61–0.72)	0.59 (CI = 0.52–0.65)
9. Happy as you were when you were younger (ATOA)	200	0.50	0.62	121 (0.83)	29 (0.21)	0.58 (CI = 0.51–0.64)	0.49 (CI = 0.41–0.56)
10. Afraid of a lot of things (A)	131	0.33	0.57	91 (0.62)	8 (0.06)	0.54 (CI = 0.47–0.61)	0.45 (CI = 0.37–0.53)
11. Get mad more (A)	152	0.38	0.66	110 (0.75)	13 (0.09)	0.60 (CI = 0.53–0.66)	0.52 (CI = 0.44–0.59)
12. Life hard much of the time? (LD)	185	0.46	0.44	104 (0.71)	38 (0.27)	0.43 (CI = 0.35–0.51)	0.32 (CI = 0.23–0.41)
13. Satisfied with life (LD)	203	0.51	0.64	120 (0.82)	26 (0.18)	0.59 (CI = 0.52–0.65)	0.50 (CI = 0.42–0.57)
14. Take things hard (A)	157	0.39	0.72	115 (0.79)	10 (0.07)	0.67 (CI = 0.61–0.72)	0.59 (CI = 0.52–0.65)
15. Upset easily (A)	320	0.80	0.37	141 (0.97)	84 (0.60)	0.43 (CI = 0.35–0.51)	0.35 (CI = 0.26–0.43)

**Table 4** Results of confirmatory factor analysis

	GFI	AGFI	CFI	RMSEA
Model 1 (15-item-one factor model)	0.80	0.86	0.92	0.07
Model 2 (15-item-three factor model)	0.98	0.97	0.98	0.04

although some of the goodness of fit indices supported this model (i.e., the AGFI was 0.86 and the RMSEA was less than 0.08). In comparison with single-factor model, three-factor model had a perfect fit. This was reflected in almost all measures including GFI, AGFI, CFI, and RMSEA (Table 4). Furthermore, all factor loadings were significant, with standardized loadings ranging from 0.52 to 0.98. The correlations between the factors were all quite high and satisfactory (Fig. 1)

#### Convergent–divergent validity

As shown in Table 5, we found positive correlations between PGCMS and SF 36-PCS, SF 36-MCS, social support total and social support sub domains, while negative correlations between PGCMS and hopelessness.

#### Reliability

The extent of the internal consistency of the PGCMS was examined by calculating Kuder-Richardson 20 reliability

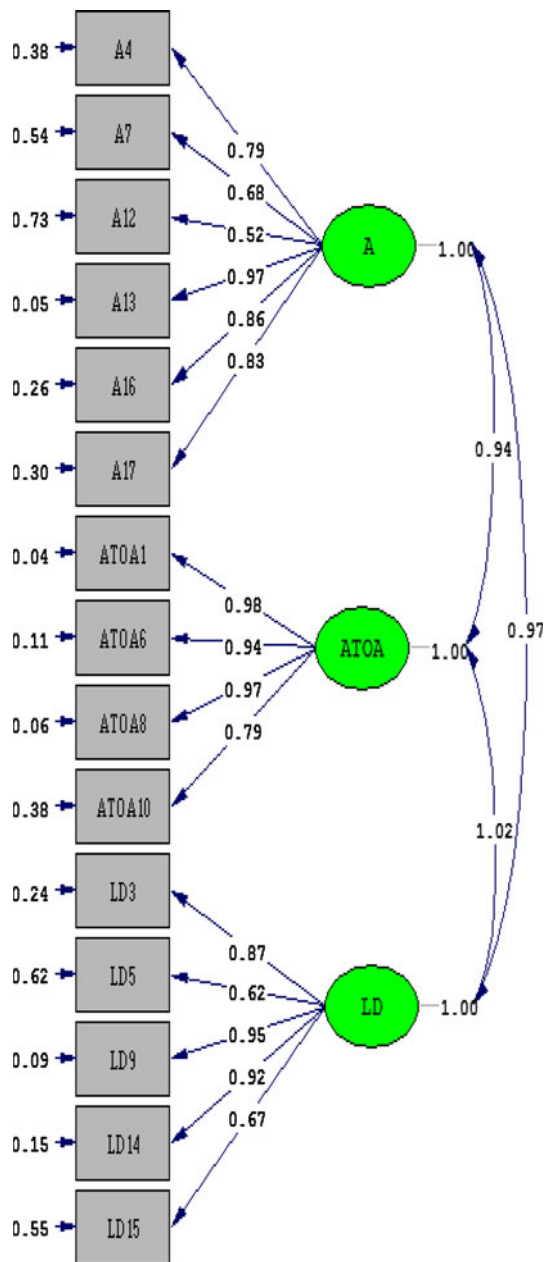
coefficient for the 15-item instrument. The total instrument was found to have a reliability coefficient of 0.92 (CI = 0.90–0.93). The A, ATOA, and LD subscales revealed reliability coefficients of 0.85 (CI = 0.82–0.88), 0.81 (CI = 0.77–0.84), and 0.76 (CI = 0.72–0.80), respectively. Item-total correlations ranged between 0.39 (CI = 0.30–0.47) and 0.73 (CI = 0.68–0.77) (Table 6).

#### Discussion

This paper reports translation procedure, structure, validity, and reliability findings of the Turkish PGCMS in Turkey. In general, findings showed satisfactory results and they were comparable with most research findings.

Translation of an existing instrument into another language is not a simple translation of words; it requires extensive developmental research to produce a culturally equivalent form of the instrument and psychometric testing to establish equivalence [40, 41].

In the present research, cultural and conceptual equivalence were obtained via back translation and similar constructs in the PGCMS. In the translation process, we followed the guidelines for cross-cultural adaptation of psychometric measurements. The PGCMS-Turkish version was culturally applicable and relayed the intent of the original English PGCMS. Results demonstrated linguistic and cultural equivalence of English and Turkish versions of PGCMS.



**Fig. 1** The results of confirmatory factor analysis of the three-factor model of the PGCMS

### Construct validity

#### Structure of the PGCMS

Our study confirmed that the Turkish 15-item PGCMS has three factors. This is consistent with some previous studies, which found that the PGCMS included three factors [2, 4, 12–14]. Morris and Sherwood examined the factor structure in two samples of elderly and moderately handicapped patients. They found three factors including A, ATOA, and LD [14]. Lawton replicated this result among four different

samples including 872 and 406 housing subjects, 300 institutional subjects, and 269 patients [2]. Liang and Bollen identified three factors similar to Lawton's study in a sample consisting of 3,996 community elderly respondents [4]. The same three-factor structure was further confirmed by McCulloch [13]. Liang et al. further showed that the three-factor solution applied in a Japanese study [12]. In another study, three factors were found similar to studies we mentioned earlier with CFA. However, an exploratory factor analysis revealed two factors in an elderly Chinese population in Hong Kong [8].

Although almost all researchers agree that the PGCMS has three factors, there is a controversy about how many items to include. Some researchers [4, 14] found that two questions (LD 3 and LD 5) were conceptually different from the rest of the scale and should be omitted, but Lawton [2] recommends retaining them. Wong et al. [8] found that four items (ATOA 6, LD 9, LD 11, A 16) were reluctant when the instrument was applied to institutionalised elderly people. They recommended these questions should be omitted when the scale was used for this group. In the current study, two items (ATOA 2 and LD 11) were excluded because of multicollinearity, which means these items actually measured the same thing. The evidence from current study and Wong et al. [8] study supports the notion that LD 11 ("Do you have a lot to be sad about?") may be problematic as an indicator of the PGCMS LD subscale. Moreover, ATOA 2 and LD 11 might not be central to the concept of morale and they may possibly be causally related but do not represent morale in Turkish elderly because of cultural differences. Within the present study's context, cultural differences can be easily thought of in terms of population characteristics, social structure, values, and even modal personalities. Currently, the literature on the well-being of elderly people across cultures is sparse. Torres [42] pointed out the need for studies into the understanding of how culture shapes different constructs of aging. An anthropological study carried out in Hong Kong, Pennsylvania, Illinois, Ireland, and Botswana found that how older people regard successful aging was contingent upon their cultural origins [43]. Given the knowledge of cultural effects on aging perception, it seems logical that PGCMS would have different factorial structure in different culture.

In the current study, with the exception of two deleted items, the assignment of items to the dimensions is identical to Lawton's three factor solution [2]. After deleting these two items, the CFA analysis showed that the Turkish 15-item three-factor revised model provided an excellent fit to the data (Table 4).

All items contributed to only one factor, had factor loading of  $>0.30$ , thus satisfying the criteria that predictive items have loadings [34]. These results indicate that all items were strongly related to their factors.

**Table 5** Validity results of PGCMS

	A	ATOA	LD	PGCMS-total
Quality of life				
SF 36-PCS	0.46 (CI = 0.38–0.53)	0.48 (CI = 0.40–0.55)	0.36 (CI = 0.27–0.44)	0.50 (CI = 0.42–0.57)
SF 36-MCS	0.77 (CI = 0.73–0.81)	0.69 (CI = 0.63–0.74)	0.58 (CI = 0.51–0.64)	0.79 (CI = 0.75–0.82)
Social support				
Family	0.33 (CI = 0.24–0.41)	0.38 (CI = 0.29–0.46)	0.39 (CI = 0.30–0.47)	0.42 (CI = 0.34–0.50)
Friends	0.39 (CI = 0.30–0.47)	0.39 (CI = 0.30–0.47)	0.38 (CI = 0.29–0.48)	0.44 (C = 0.36–0.52)
Significant other	0.35 (CI = 0.26–0.43)	0.42 (CI = 0.33–0.50)	0.43 (CI = 0.34–0.51)	0.46 (CI = 0.38–0.53)
Total	0.43 (CI = 0.35–0.51)	0.47 (CI = 0.39–0.55)	0.48 (CI = 0.40–0.55)	0.53 (CI = 0.45–0.60)
Hopelessness	–0.57 (CI = 0.50–0.64)	–0.65 (CI = 0.58–0.70)	–0.54 (C = 0.47–0.61)	–0.68 (CI = 0.62–0.73)

**Table 6** Reliability results of PGCMS

Items	Item-total correlation
<i>Agitation</i>	
A4	0.70 (CI = 0.65–0.75)
A7	0.61 (CI = 0.54–0.67)
A12	0.50 (CI = 0.42–0.57)
A13	0.64 (CI = 0.58–0.69)
A16	0.66 (CI = 0.60–0.71)
A17	0.67 (CI = 0.61–0.72)
Summary for subscale: KR-20 = 0.85 (CI = 0.82–0.88)	
<i>Attitude toward own aging</i>	
ATOA1	0.72 (CI = 0.67–0.76)
ATOA6	0.73 (CI = 0.68–0.77)
ATOA8	0.57 (CI = 0.50–0.63)
ATOA10	0.51 (CI = 0.43–0.58)
Summary for subscale: KR-20 = 0.81 (CI = 0.77–0.84)	
<i>Lonely dissatisfaction</i>	
LD3	0.68 (CI = 0.62–0.73)
LD5	0.46 (CI = 0.38–0.53)
LD9	0.39 (CI = 0.30–0.47)
LD14	0.64 (CI = 0.58–0.69)
LD15	0.48 (CI = 0.40–0.55)
Summary for subscale: KR-20 = 0.76 (CI = 0.72–0.80)	
<i>Total</i>	
Summary for subscale: KR-20 = 0.92 (CI = 0.90–0.93)	

The 15-item Turkish PGCMS's structure was further supported by the strong relationships observed among the subscales, suggesting perfect relations between factors (Fig. 1) [35]. Our findings showing that the PGCMS scales were identical to each other were in line with the result of another study [4]. On this basis of our research, it is possible to suggest that the nucleus of each of the three scales identified across all samples is indeed similar, although particular discrepancies do in fact exist. This indicates that the underlying conceptualization of the dimensions of morale is universal.

### Convergent–divergent validity

Correlations between PGCMS and PCS and between PGCMS and MCS in the SF-36 ( $r = 0.51$  and  $0.78$ , respectively), were satisfactory. As we expected, correlation between PGCMS and MCS was stronger than the correlation between PGCMS and PCS, because PCS is related to physical domain of life, while MCS is related to psychological domain of life. Moreover, there are some similarities in the items of sub domains in the MCS (general health perception, vitality, social functioning, role limitations due to emotional problems, and mental health) with the items in the PGCMS. This finding suggests that the MCS in the SF-36 and PGCMS assess the same issues and measure similar attributes. Our results were comparable with the findings from three studies [5, 8, 9], who found that there was a relationship between PGCMS and overall satisfaction with life.

The PGCMS showed positive correlation with social support assessed by MSPSS. Living in ordinary housing with family members, family support [6], social activities [44] and not feeling lonely [7, 44] are the social factors that are most strongly associated with PGCMS scores. In the present study, the association between social support and morale was not surprising, because lonely dissatisfaction is a subscale of the PGCMS. However, it should kept in mind that the items in the lonely dissatisfaction sub domain do not hold expectations for a high level of interpersonal contact, but rather seek to ascertain the individual's reaction to the relationships he or she maintains [2]. Loneliness has been shown, in previous studies, to be related to low morale [7, 44].

The PGCMS correlated very strongly with the BHS. When we investigated the item content of the scales, we realized that the items of the both scales were quite similar. The items of both PGCMS and BHS contain positive as well as negative affects and also contentment (e.g. 'satisfied', 'happy' and 'hopeful'). Moreover, despite the fact that the PGCMS is considered as a positive scale, it has



more items that contain negative effects (12 in 17-item original PGCMS, 71%; 10 in 15-item revised Turkish PGCMS, 66.7%) than the BHS (11 out of 20; 55%). We think that, with new adapted scoring methods, each of these scales may be used as a single measure for QOL, covering both positive and negative aspects.

Additional evidence of the Turkish PGCMS construct validity was a satisfactory level of reliability findings for each subscale.

## Reliability

In the present study, reliability of the Turkish PGCMS yielded satisfactory results. Reliability coefficient for the total instrument was ideal; the Kuder-Richardson 20 reliability coefficients for two subscales (A and ATOA) were very acceptable. Finally, the LD subscale showed Kuder-Richardson 20 reliability coefficients that exceeded the acceptable standard. Our results were comparable with findings from Lawton, who found that internal consistency coefficients ranged from 0.81 to 0.85 [2]. Our results were also comparable to the study of Morris and Sherwood in which the internal consistencies were between 0.62 and 0.76 [14]. Based on these studies, we can conclude that three subscales in the PGCMS have been consistent and replicated. We obtained satisfactory corrected item-total correlations for each of items, which were higher than 0.20 [34].

In summary, the present research confirmed the three-factor structure, construct validity and reliability of the revised Turkish 15-item PGCMS. However, it should be noted that it has certain limitations. First, the data collected in this study covered only elderly who live at elderly care institutions. Second, the majority of participants were men, unmarried, and 62.5% of them described their health status as poor/fair. Third, the educational level in this study was quite low. Currently, everyone in Turkey receives at least 8 years of compulsory education, so that the response to the PGCMS may be different for future elderly populations with a higher level of education. Therefore, the results of the present study have to be interpreted with some cautions. Further research on the validity and reliability of the PGCMS is needed with regard to larger samples including institutional and community elderly participants. Efforts are also needed to explore the effects of sex, marital status, different educational level, and health status on the morale. Such efforts will extend the generalizability of the Turkish 15-item PGCMS model. Finally, we collected data on a single appointment. It is possible that morale can be invariant over time, although the PGCMS is widely used as a measurement tool. Therefore, future research should further evaluate the stability of the PGCMS.

## Conclusion

This study shows that PGCMS Turkish version consisting of 15 items has satisfactory levels of construct validity, internal consistency, and item-total consistency. Our results proved that Turkish PGCMS will be a valid and reliable instrument for use in elderly populations, who live in elderly care institutions in Turkey.

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