

Validity and Reliability of the Persian Version of the Revised Caregiving Appraisal Scale in Iranian Family Caregivers of Older Adults with Dementia

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Abstract

Background: Caregivers' self-assessments of the care they provide are the main vehicles that help explore their experiences and are thought to have a major role in care outcomes. The rising number of people with dementia and their need for care provided within the family makes family caregiving a major topic for study and evaluation.

Objectives: The present study was conducted to assess the psychometric characteristics of the Persian version of the revised caregiving appraisal scale (RCAS) in family caregivers of older adults with dementia.

Methods: In this cross-sectional methodological study, 236 family caregivers were recruited through convenience sampling. The revised caregiving appraisal scale (RCAS) was translated using the international quality of life assessment (IQOLA) protocol, and then a panel of experts examined its face and content validities. To ensure construct validity, the translated revised caregiving appraisal scale (RCAS) was completed by 236 family caregivers, and the factor construct of the scale was assessed using five initial factors for confirmatory factor analysis. Internal consistency was confirmed using Cronbach's alpha, and test-retest using the intraclass correlation coefficient (ICC). The confirmatory factor analysis was performed with LISREL-8.8 software for Windows®.

Results: The mean age of the participating caregivers was 53.5 ± 13.13 years. The content and face validities of the scale were confirmed using the feedback of the family caregivers and panel of experts. The confirmatory factor analysis results reported appropriate values for all the fit indices (RMSEA = 0.046, $df / \chi^2 = 2.428$, CFI = 0.98, AGFI = 0.84, and GFI = 0.9), and the 5-factor model was confirmed with 27 items. The scale-level Cronbach's alpha was reported as 0.894 and the scale-level ICC as 0.94. The scale met the minimum reliability standards (Cronbach's alpha and intraclass correlation coefficient > 0.7).

Conclusions: This study has provided some preliminary evidence of the reliability and validity of the Persian version of RCAS when used with family caregivers of older adults with dementia.

Keywords: Psychometric, Dementia, Elderly, Self-Appraisal, Family Caregivers, Reliability and Validity

1. Background

The older adult population is increasing due to a falling birthrate and a global rise in life expectancy, resulting in a significant global increase in the prevalence of debilitating age-related diseases such as dementia; in fact, the number of people with dementia is expected to double every 20 years, with a much sharper rate of growth in Asian countries. Two-thirds of the world's population of people with dementia live in low to medium income countries (LMIC), thus multiplying the importance of providing family cares for patients with dementia. Dementia has recently been acknowledged as a major challenge to public health due to the diminishing ability of the affected to lead an independent life and the subsequent economic

burden on both formal and informal health care systems. Providing care to people with dementia involves a variety of human, social and economic dimensions, and imposes an economic burden on the individual, the family and the community (1, 2).

Across the world, the family provides 80% of the care for older adults with debilitating conditions, particularly in developing countries (3, 4). Despite the cost-effectiveness of this type of care, excessive reliance on the family for care and failure to provide adequate support for the caregivers themselves lead to various physical, mental, social, and financial problems for the caregivers, and have implications for society as a whole (5). In developing countries, where families receive little support from public sys-

tems, dementia has dramatic effects on the family structure (6-8). Intercultural studies show differences between caregivers from eastern and western countries, since, in Asian countries, family caregivers rely mainly on family resources and support, whereas western caregivers receive formal outside support. Furthermore, the dominant culture of a society has a multifaceted effect on its caregivers' experiences of care and their manner of appraising their daily activities, personal and social resources, the meaning of caregiving, and their family member's disease symptoms (9-11).

A caregiver's self-evaluation is one of the most useful ways to explore their experiences (12). Not all caregivers perceive their role as stressful and hectic, and the demand for care does not cause stress per se; some caregivers tend to rate their caregiving functions positively (i.e. they feel good about their situation and feel confident in their provision of care) and thus experience improved psychological outcomes from their care (13). Such an appraisal of care is considered a more important determinant than objective indices, such as the degree of dependence and disease symptoms, for predicting care outcomes (12, 14). For instance, the caregiver's subjective perception of the burden of care is a powerful predictor of the older adult's admission to nursing homes and the eventual termination of home care (15, 16). For example, the caregiver's perception of care is a subjective burden that acts as a powerful predictor of the older adults' admission to nursing homes and the end of home care for them (17). Despite the researchers' consensus on the construct being multifaceted, studies still tend to emphasize the negative aspects of care and ignore its positives; so portraying the dynamic nature of care requires an emphasis on all the aspects it entails (8, 18). The caregivers' completion of this appraisal form helps the researchers understand the positive and negative experiences of caregiving, and the negative psychological outcomes of family caregiving can thus be reduced through early interventions based on an understanding of these experiences. The results of studies conducted on caregivers also suggest a relationship between the caregivers' experiences and their family members' care outcomes, and confirm the effectiveness of experience-based interventions. Assessing the effectiveness of these interventions requires a valid tool.

Lawton was the first to propose a method of care appraisal that takes into account all the positive and negative aspects of care. In 1989, his initial definition of a caregiving appraisal entailed, "all cognitive and affectional appraisals and reappraisals of the potential stressor and the efficacy of one's coping efforts while providing care to older adults." By this definition, a caregiving appraisal should include dimensions such as caregiving mas-

tery, perceived burden on the caregiver, perceived environmental/behavioral impact, and caregiving satisfaction and reappraisal (13). Based on the experiences gathered through the initial version of the Caregiving Appraisal Scale, Lawton et al. (19) proposed the revised caregiving appraisal scale (RCAS) in 2000 with 27 items and five dimensions (caregiving burden, satisfaction, mastery, demand, and impact). All the scale items are scored based on a 5-point Likert scale from 1 (never) to 5 (almost always); the overall score ranges from 27 to 135 points, and a higher score indicates a more negative appraisal of caregiving. The present study selected the RCAS from among a variety of family caregiving appraisal tools, since it accounts for different positive and negative dimensions of appraisal and is based on Lazarus and Folkman's powerful and well-known stress and coping theory (12, 20). This scale has been widely used in English-speaking countries and its validity and reliability have been confirmed in various studies. In addition, it has been used most frequently with caregivers of vulnerable older adults who have cognitive impairments (19, 21-24). Despite being very well-known in western cultures and English-speaking countries, Lawton's scale has had limited use in other cultures and languages, which further necessitates the confirmation of its validity and reliability for application in eastern countries that are not English-speaking.

Despite the importance of the subject, no valid and reliable appraisal tools have yet been developed for caregivers of people with dementia in Iran. The absence of a proper tool has been a challenge to the development of studies on caregivers, and comprises a major barrier to the development of knowledge in the field of caregiving for dementia patients. This, in turn, stands in the way of the design of interventions, the appraisal of their impact, and the performing of necessary follow-up.

2. Objectives

The present study was conducted to translate and assess the psychometric characteristics of Lawton's Revised Caregiving Appraisal Scale (RCAS) for family caregivers of older adults with dementia in Iran.

3. Methods

3.1. Patients and Method

The present cross-sectional methodological study was conducted between January and August 2015 in Tehran. Tehran has an area of 18,150 km² and a population of 8.2 million (2012 census). Located in northern Iran, it is the largest city in Iran and the nation's capital. Persian is the

city's native language, with roughly 98% of the population able to speak and understand it. The majority of people in Tehran identify themselves as Persians. But Tehran has drawn a large number of migrants from various areas and ethnic groups (Persians, Turks, Baluchis, Arabs, and Kurds) with different cultures from all around Iran. The Revised Caregiving Appraisal Scale (RCAS) was translated into Persian and the psychometric characteristics of the translated version were then assessed in family caregivers of older adults with dementia. The study population consisted of all family caregivers of patients with dementia in Tehran. Participants were selected through convenience sampling from among the patients admitted to the memory clinic of Yadman and Iran Alzheimer's association in Tehran. These are the only referral centers for patients with dementia. Since these centers accept patients from all over the country, the results of the study can be generalized to all of Iranian society.

The study inclusion criteria for family caregivers consisted of being willing to volunteer in the study, being the principal caregiver (23), providing regular care to the patient for at least 5 hours per week for a minimum of 6 months, not being paid for the care provided, and assisting the older adult in at least in one of his daily activities or in two of his essential daily activities (25, 26). Type of dementia was not considered an inclusion criterion. All family caregivers referred to these centers who met the inclusion criteria were invited to participate, but only 260 of them agreed to do so. Twenty-four caregivers who did not fill out the questionnaire completely were excluded from the study, so there were no missing values. Data from 236 family caregivers was collected since at least 200 participants were required for the assessment of the construct validity of the scale through factor analysis (27). Sampling continued until the desired sample size was fully achieved.

3.2. Translation and Preparation of the Tool

The scale was translated according to the international quality of life assessment IQOLA protocol (28). After obtaining permission from the publisher and designer of the scale, the original version was translated from English into Persian by two Persian-speaking translators fluent in English, one of whom was familiar and the other unfamiliar with the construct. The two translators had no contact with each other during the translation process. In a joint meeting between the research team and the translators, the translation of the scale was discussed and the importance of ensuring cultural equivalence between the scales and carrying out a careful localization was emphasized. With the consensus of the entire team, a single Persian version was developed. A third translator confirmed

the quality of the translation's clarity, use of common concepts, and conceptual equivalence and acceptability. The Persian version was then translated back into English by two additional translators, one of whom was a native English speaker fluent in Persian and both of whom had not seen the original English version. Both translated versions were evaluated and compared with the original version of the scale in a meeting between the team members, who found no conceptual differences between the versions. The version that was translated back into English was finally forwarded to Dr. Allen Glicksman, one of the members of the scale's design team, who approved the translation.

3.3. Scale Validation Methods

The content, face and construct validity methods were used for the validation of the scale.

3.3.1. Content Validity

The content validity of the scale was assessed quantitatively and qualitatively using the views of 10 experts in the following fields: gerontology (three), psychiatry (one), geriatric nursing (two), clinical psychology (two), and psychometrics (two). All of them had experience in either dementia care or scale development. The content validity index (CVI) was used for the quantitative part of the assessment, and the scale's compliance with Persian grammar, its use of appropriate terminology, its good phrasing, the scoring method used and the responses given were then examined for the qualitative part of the assessment. Based on the index proposed by Waltz and Bausell, $CVI < 0.7$ was unacceptable, $0.7 < CVI < 0.78$ required modification and revision and $CVI \geq 0.79$ was acceptable (29, 30).

3.3.2. Face Validity

The face validity of the scale was assessed using the views of the same 10 experts as well as 15 family caregivers for older adults with dementia. They were all asked to comment on the difficulty of the scale's terminology and statements (difficulty), the compatibility of the items with the dimensions (compatibility) and the likelihood of misunderstanding the items and the word ambiguities (ambiguity). In this pilot study, the family caregivers were also asked cognitive questions to assess their understanding of the items.

3.3.3. Construct Validity

The construct validity of the scale was assessed using confirmatory factor analysis. The questionnaires were then completed by 236 caregivers, and the 5-factor model proposed by Lawton et al. (19) in the Revised Caregiving Appraisal Scale (RCAS) was tested.

The confirmatory factor analysis was performed in LISREL to test out the assumed factor structure (to confirm the extracted factors). A model was developed based on the previous information available on the structure of the data, and the model data produced as raw data in SPSS were entered for analysis. The criteria used in this study for assessing the model fit included the Chi-square (χ^2), the degree of freedom to Chi-square (df / χ^2), the goodness of fit index (GFI), the adjusted goodness of fit index (AGFI), the comparative fit index (CFI), the Normed Fit Index (Bentler-Bonett) and the root mean square error of approximation (RMSEA).

A statistically insignificant Chi-square implied a highly favorable fit; however, in samples greater than 200, the Chi-square is often significant and is therefore not an appropriate index for the assessment of the fit of a model. $Df/\chi^2 < 3$ suggested a very favorable fit. GFI, CFI and NFI > 0.9 , AGFI > 0.85 and RMSEA < 0.05 implied a highly favorable fit while values below 0.08 indicate only a good fit (31).

3.3.4. Reliability

The reliability of the scale was assessed using test-retest and internal consistency methods. Cronbach's alpha was calculated to assess the internal consistency of the scale. To assess the stability of the scale, the test-retest correlation was calculated for 21 participants through the intraclass correlation coefficient with an interval of 14 days.

3.4. Ethical Considerations

The study protocol was approved on January 18, 2015, by the ethics committee of the University of Social Welfare and Rehabilitation Sciences in Tehran, Iran (USWR. REC. 1393. 187). The ethical aspects of the study included obtaining informed written consents from all participants prior to beginning the study, and briefing them on the study objectives and methods. The researchers also obtained permission from the publisher and one of the designers of the scale (Dr. Allen Glicksman) to translate the scale and ensure its cultural equivalence with the original. All caregivers were informed that their participation was voluntary; all their information would be kept confidential and they could refuse to fill out the questionnaire even after receiving the questionnaire.

3.5. Statistical Analysis

The data obtained were analyzed in SPSS-20 (SPSS Inc., Chicago, ILL, USA) using statistics that included the percentage, mean and standard deviation of the demographic variables; Cronbach's alpha for determining the reliability of the scale; and the ICC for determining the stability of the

scale. The confirmatory factor analysis was performed in LISREL-8.8 for Windows®. $P < 0.05$ was considered significant.

4. Results

4.1. Sample Characteristics & Descriptive statistics

Out of 260 study cases, 236 returned the completed questionnaire (Response rate = 90.76 %), and all of the responses were analyzed. A total of 79.7% of the participants were female, 72.9% were married, 49.6% were daughters of the care recipients, and 38.6% had associates or bachelor's degrees. The caregivers had a mean age of 53.5 ± 13.13 , ranging from 25 to 85. Tables 1 and 2 present a description of the sample characteristics and a comparison of the caregivers' perceptions of caregiving allowing for selected demographic variables. Scores on each of the five RCAS factors were calculated to evaluate the presence of ceiling and floor effects. Histograms did not reveal large clusters of cases at either end of the distribution for any factor.

4.2. Content and Face Validity

The Scale-level Content Validity Index (SCVI) was 0.96 and the scale was given scores of 0.97, 0.95 and 0.97 for its clarity, relevance and simplicity, respectively. Based on the findings of the pilot study and the expert panel, minor changes were made in the wording three questions. These changes preserved the main content and did not change in the number of the items.

4.3. Construct Validity

Before performing the confirmatory factor analysis, the normal distribution of all the data was verified and confirmed by the Kolmogorov-Smirnov test. A 27-item scale with five dimensions was used for the confirmatory factor analysis. Table 2 presents the fit indices of the model. The results obtained from the confirmatory factor analysis confirmed the five-factor model (Figure 1).

4.4. Reliability

Cronbach's alpha was calculated as 0.89 for the whole scale and as 0.89, 0.84, 0.71, 0.55, and 0.61 for the subscales of caregiving burden, satisfaction, impact, mastery, and demand, respectively. The ICC was calculated as 0.94 for the test-retest reliability of the RCAS ($P < 0.001$). The correlation coefficient was calculated as 0.84, 0.89, 0.93, 0.98, and 0.91 for the subscales of caregiving burden, satisfaction, impact, mastery and demand, respectively (Table 3).

Table 1. Description of Sample Characteristics and Study Variables in Family Caregivers of Older Adult With Dementia (n = 236)^a

Characteristics	No. (%)	Mean ± SD	P Value
Age, y		53.5 ± 13.13	
Gender			0.124
Female	188 (79.7)	99.28 ± 16.93	
Male	48 (20.3)	103.75 ± 18.29	
Marital status			0.593
Single	39 (16.5)	101.62 ± 16.98	
Married	179 (72.5)	99.72 ± 17.77	
Divorced	13 (5.5)	97.07 ± 14.45	
Widowed	12 (5.1)	105.72 ± 13.34	
Relationship to the older adult			0.105
Wife	57 (24.2)	95.96 ± 19.06	
Husband	20 (8.5)	97.65 ± 19.17	
Daughter	117 (49.6)	101.20 ± 15.60	
Daughter in-law	9 (3.8)	98.37 ± 20.51	
Son	27 (11.4)	108.21 ± 15.61	
Other (sister, brother, grandchild)	6 (2.4)	98.80 ± 21.51	
Education			0.360
No formal education	10 (4.2)	101.30 ± 23.06	
Primary and Secondary school	42 (17.8)	95.87 ± 15.32	
diploma	66 (28)	102.41 ± 17.43	
Associate diploma and bachelor's degree	91 (38.6)	101.22 ± 17.91	
Master's degree and higher	27 (11.4)	97.77 ± 14.82	
Income			0.242
Very poor	7 (3)	93.42 ± 28.26	
Poor	35 (14.8)	96.47 ± 16.00	
Moderate	118 (50)	102.15 ± 16.33	
Good	59 (25)	98.30 ± 17.51	
Very good	7 (3)	103.82 ± 18.65	

^aValues are expressed as No. (%) or mean ± Standard deviation.

5. Discussion

This study was the first research that carried out to validate the RCAS for Iranian family caregivers. Few cross-cultural comparisons have been conducted using caregiving appraisals. So, we envision that validating the revised caregiving appraisal scale (RCAS) in different cultures will encourage researchers conducting these studies. We thought this could provide an opportunity for future research to compare caregiving appraisals among the Iranian population with people living in other communities.

Several tools have been designed in recent decades for

assessing the experiences of informal caregivers. According to experts, the right tool for assessing the experiences of caregivers of patients with dementia should be multi-dimensional, based on well-known theories, include both the negative and positive dimensions of care, and have favorable psychometric characteristics (32). The RCAS was chosen as an appropriate tool and was then translated into Persian taking into account the cultural equivalence between the two versions, and its psychometric characteristics and factor structure were then evaluated. Psychometric assessment is vital for any tool that is translated into another language and culture since the tool may not be

Table 2. Scores for RCAS and its Dimensions in Family Caregivers of Older Adult With Dementia (n = 236)^a

Possible Range	Mean ± SD	Number of Items	Sub-Scale
9 - 45	31.26 ± 8.60	9	Burden
6 - 30	23.73 ± 23.73	6	Satisfaction
6 - 30	23.04 ± 23.04	6	Mastery
3 - 15	10.40 ± 3.00	3	Demand
3 - 15	11.57 ± 2.77	3	Impact
27 - 135	100.16 ± 17.26	27	Total

Abbreviation: RCAS, revised caregiving appraisal scale.

^aValues are expressed as mean ± Standard deviation.

Table 3. The Five-Factor Confirmatory Factor Analysis Results of RCAS in Family Caregivers of Patients With Dementia in Iran

Fitness Indices	χ^2	df	P	χ^2/df	CFI	GFI	AGFI	NFI	RMSEA
Five-factor model	430.44	295	< 0.001	2.428	0.98	0.9	0.84	0.94	0.046

Abbreviations: χ^2 , Chi-square; df, degrees of freedom; χ^2/df , ratio of chi-square to degrees of freedom; CFI, comparative fit index; GFI, goodness of fit index; AGFI, adjusted goodness of fit index; NFI, normed fit index; RMSEA, rocky mountain service employment redevelopment; RCAS, revised caregiving appraisal scale.

Table 4. Internal Consistency and Test - Retest Reliability of the Sub-Scales of RCAS in Family Caregivers of Patients With Dementia in Iran

Sub-Scale	Number of Items	Cronbach's Alpha	Test-Retest Reliability
Burden	9	0.89	0.84
Satisfaction	6	0.84	0.89
Mastery	6	0.55	0.98
Demand	3	0.61	0.91
Impact	3	0.71	0.93
Total	27	0.89	0.94

Abbreviation: RCAS, revised caregiving appraisal scale.

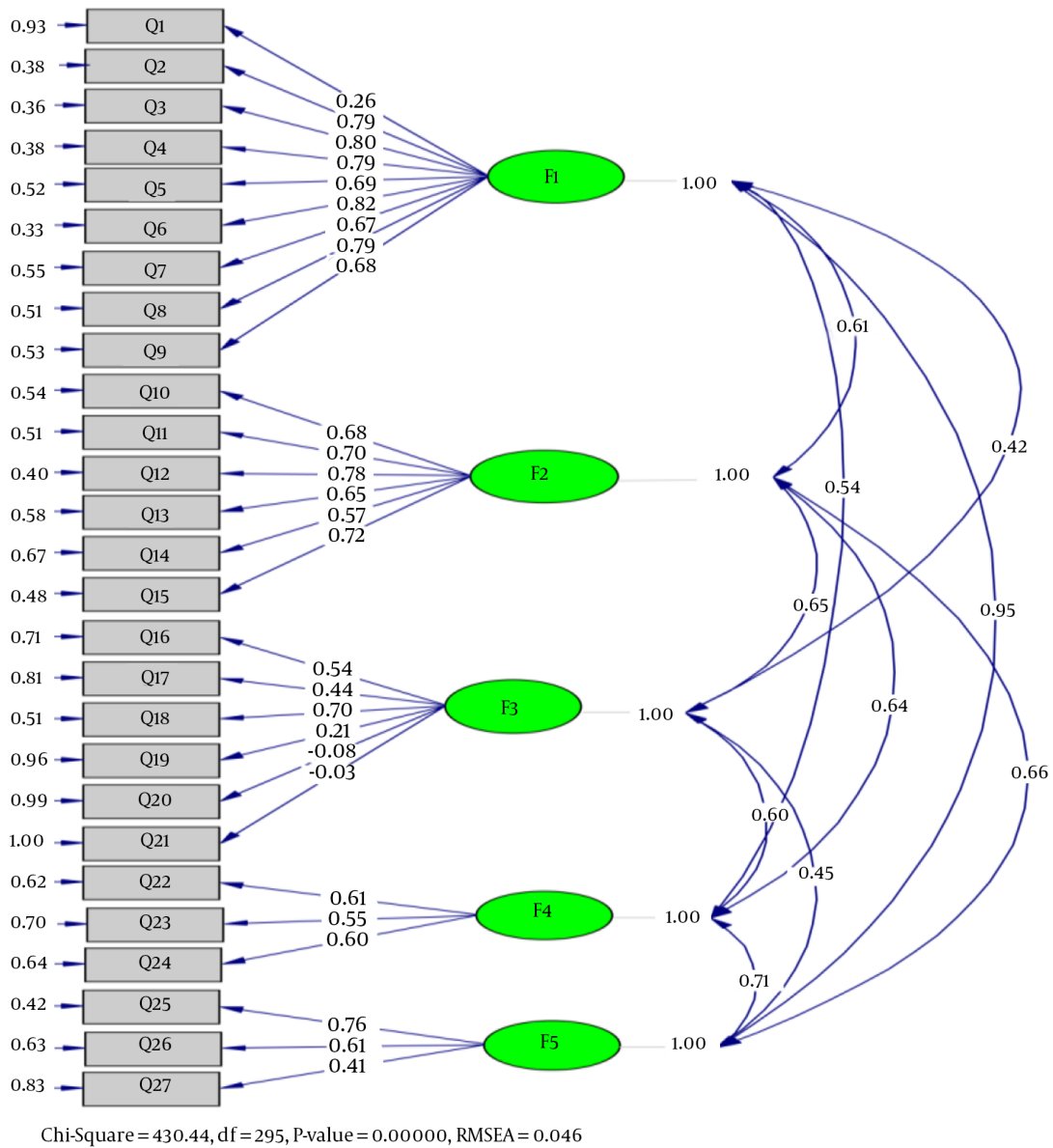
suitable for use in that particular society. The present study confirmed the validity and reliability of the Persian version of the RCAS, and its five-dimensional factor structure was found to be similar to the original version. The assessment of the content and face validities of the scale did not result in changes in the number of items, and only some of the items were revised in order to preserve the main content. CVI > 0.9 (33) indicates the good content validity of the scale.

The confirmatory factor analysis of the RCAS showed that the five-dimensional factor structure of the Persian version of the instrument was similar to the original revised version. Lawton et al. also confirmed 25 items and five dimensions for their revised scale, while in their initial version; they had confirmed only three dimensions, including caregiving burden, satisfaction and impact (13). In their study on Korean family caregivers, Lee et al. found 27 items and six dimensions, and divided the subscale of

mastery into two parts (22). In the study conducted by Se-vick et al. (34) on family caregivers of patients requiring home ventilators, the fit indices of the five-factor model were deemed unfavorable and only the dimensions of caregiving burden and satisfaction were confirmed. The subscales of impact and burden were then combined, with the mastery subscale not being confirmed. The differences in the approved factorial structure of these studies may be attributed to the differences in the target groups and the type of care provided by them. For instance, caring for stroke and ventilator-dependent patients is not the same as caring for dementia patients, and this difference may have affected the caregiver's perception of care.

The scale-level reliability coefficient was favorable and the subscale of mastery had the lowest internal consistency coefficient of all the subscales. Cronbach's alpha was also calculated for assessing the internal consistency of the scale. Cronbach's alpha ranges from 0 to 1 and the

Figure 1. The Five-Factor RCAS Model Derived From Confirmatory Factor Analysis



F1, burden; F2, satisfaction; F3, mastery; F4, demand; F5, impact; RMSER, rocky mountain service employment redevelopment.

closer it approaches 1, the higher the scale's internal consistency. Cronbach's alpha values above 0.8 are considered good, above 0.7 acceptable, between 0.6 and 0.7 questionable, between 0.5 and 0.6 poor, and below 0.5 unacceptable (33). The scale-level Cronbach's alpha was good. However, only the caregiving burden, satisfaction, and impact subscales had an acceptable Cronbach's alpha, while care-

giving demand had a questionable alpha, which may have been due to the small number of the items (three). As for the low alpha value of the caregiving mastery subscale, items 21 and 22 showed the lowest correlation with the scale as a whole and may be responsible for that subscale's poor alpha value. Since eliminating items from a scale and making changes to its structure cannot be solely based on

the results of one single study, future studies are recommended to further examine this subscale, particularly with respect to the two discussed items. The concepts incorporated into these two items include “more work” and “better care”, which may generate different reactions in different individuals. Some people consider more work and better care a virtue and a way of compensating for the good efforts of their patient in the past, while others become defensive and react as if their care efforts are being questioned. Given the cultural aspect of the care process, the response to these two questions may have somehow been affected by the dominant culture of Iran. Conducting further qualitative or mixed methods studies may therefore help us understand these concepts from the perspective of Iranian caregivers. This subscale showed a poor internal consistency compared to the other subscales in studies conducted in other countries and on different groups of caregivers as well (13, 19, 21, 22, 35, 36).

The test-retest reliability and stability of the scale and the ICC showed favorable values, since $ICC \geq 0.8$ indicates a favorable stability (33). Previous studies have also reported a favorable reliability for this scale using measures such as the Pearson correlation coefficient (13, 19, 22). Given the nature of the condition in question and the care provided, this study chose a two-week interval for its retest, intending to control the effects of memory and actual changes. Before the retest, the older adults' level of dependence and disease-staging were assessed once again to ensure their consistency with the conditions prevailing during the initial test.

The strengths of the study include its use of the IQOLA protocol in the translation process and the presence of five skilled translators who focused on establishing a cultural equivalence between the original and the translated versions of the scale. Limitations of the study include the lack of a standard Persian scale for assessing the concurrent validity of research tools as well as the inability of some of the caregivers to read the forms by themselves due to illiteracy or not having brought their glasses with them; in the latter situations, the forms were completed through interviews.

The results of the study indicate that the Persian version of the revised caregiving appraisal scale (RCAS) showed a good validity and reliability, and its 5-factor structure matched the structure of the original version of the scale. The translated RCAS is therefore an appropriate tool for the appraisal of family caregivers of older adults with dementia and for assessing the effectiveness of interventions performed on this particular group of caregivers. Further qualitative studies should be conducted to clarify the concept of caregiving and its dimensions in Iranian caregivers, evaluate caregiver appraisal models over time, and assess the psychometric characteristics of the scale

among caregivers of other groups of patients with debilitating conditions.

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Footnotes

Authors' Contribution: Akram Farhadi, collection and analysis of data and writing the article; Mahshid Foroughan and Akram Farhadi collected the data and carried out the statistical analyses and composed the article; Mahshid Foroughan supervised the design of the study and the composing of the article; Farahnaz Mohammadi helped with the design of the study and the revision of the article; Maryam Rassouli helped with the design of the study, the statistical analysis of the data, and the interpretation of the results; Maryam Noroozian helped with the collection of the data and the interpretation of the results; Leila Sadegh Moghadam, Shima Nazari, and Narjeskhatoun Sadeghi helped with the design of the study and the collection of the data; All the authors read and approved the first draft of the article.

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