

Psychometric Properties and Cut-off Points of Burden and Satisfaction Associated with Caregiving Role among Iranian Grandparents

Ebrahim Nazari Far¹, MSc;
 Mohammad Hossein Kaveh²,
 PhD; Elham Rezaian³, MSc;
 Mahsa Yarelahi¹, MSc;
 Abdolrahim Asadollahi^{1*}, PhD

¹Department of Aging Health,
 Shiraz University of Medical Sciences,
 Shiraz, Iran;

²Department of Health Education and
 Health Promotion, Shiraz University of
 Medical Sciences, Shiraz, Iran;

³Department of Aging Health, Faculty
 of Health, 3rd Floor, Shiraz University of
 Medical Sciences, Razi Ave.,
 Shiraz, Iran

Correspondence:

Abdolrahim Asadollahi, PhD;
 Department of Aging Health, Faculty of
 Health, 3rd Floor, Shiraz University of
 Medical Sciences, Razi Ave., P.O. Box:
 71536-75541, Shiraz, Iran

Email: A_asadollahi@sums.ac.ir

Received: 10 July 2020

Revised: 13 August 2020

Accepted: 20 September 2020

Abstract

Background: Caregiving burden is defined as a specific level of pressure and problems expressed by caregiver or family, which involves a range of psychological, emotional, social and economic problems. Further, satisfaction is described as the level of the mental happiness, self-confidence and usefulness sensed by caregiver about his/her own caregiving behaviour. The present study aimed to assess the psychometric properties of the Persian version of caregiving satisfaction (SCR) and caregiving burden of grandchildren scales (BCR) among grandparent population by considering the lack of a Persian tool for their measurement.

Methods: This cross-sectional, descriptive-analytic study was conducted on 70 grandparents who were selected through convenience sampling among the individuals referred to the healthcare centres of five southern cities in Iran Shiraz, Sepidan, Fasa, Jahrom, and Borazjan from April to August, 2019. The questionnaires were filled out by individual interview with participants and the data were analysed through explanatory and confirmatory factor analyses and ROC curve, using SPSS 25 and Amos 21.

Results: Two factors were extracted in each questionnaire (Regarding each questionnaire, happiness and responsibility in individual and social satisfaction in caregiving burden were extracted through explanatory factor analysis), representing 78.1 and 75.1% of total variance, respectively. The Cronbach's coefficients alpha related to these subscales were obtained as 0.709-0.859 by indicating an acceptable internal consistency.

Conclusion: The Persian version of these questionnaires had appropriate validity and reliability required for measuring satisfaction and caregiving burden of grandchildren among Iranian grandparents and can be used in day care and healthcare centres.

Please cite this article as: Nazari Far E, Kaveh MH, Rezaian E, Yarelahi M, Asadollahi A. Psychometric Properties and Cut-off Points of Burden and Satisfaction Associated with Caregiving Role among Iranian Grandparents. *J Health Sci Surveillance Sys*. 2020;8(4):156-161.

Keywords: Grandchildren, Caregiving burden, Caregiving satisfaction, Grandparenting

Introduction

The growth related to the great population of the grandparents playing the role in caregiving their grandchildren has attracted the researchers' attention

since 1990s.¹ The population of the grandparents who consider caring grandchildren as their primary responsibility is rapidly grown in America.² Chinese grandparents consume much time for caregiving their grandchildren since this is regarded as one

of intergenerational supports.³ The percentage of the grandchildren living with their grandparents increased from 3.2 to 5.4% during 1970-1994.⁴ Further, 6.3% of American children (4, 533, 016) lived with their grandparents in 2000.⁵ Regarding a group of grandparents, the grandmother caregivers aged 50-64 were the key characters living with their grandchildren under 18-years old in one house.² The number of Iranian grandparents increased around seven times during 1956-2006, while it increased more until 2013 due to the young population structure of Iran.⁶

Although grandparents face with high challenges and great social and personal costs in caregiving their grandparents, such relationships can be associated with caregiving benefits. In fact, researchers have found that many grandparents have self-satisfaction and receive award by helping their adult children.⁷ Further, caregiving can lead to negative individual, inter-individual, economic and health consequences such as the reduction of physical and mental health,⁸⁻¹⁰ their higher isolation compared to those of peers and non-caregivers,¹¹ and overload and confusion of the role.¹² Caregiving burden is defined as a specific level of the pressure and problems expressed by caregiver or family, which involves a range of psychological, emotional, social and economic problems.¹³ Further, satisfaction of caregiving is described as a level of mental happiness, self-confidence and usefulness which caregivers (grandparenting) feel about their own caregiving behaviour toward their grandchildren.⁴ The pressures may be caused by lack of knowledge and experience in grandparents in the field of new technologies with which their grandchildren are familiar.¹⁴ The existence of a tool to measure satisfaction and the caregiving burden of grandchildren for research objectives and evaluation of supporting programs are regarded essential. Further, only one 8-item satisfaction and a 13-item caregiving burden of grandchildren questionnaires were available. These tools were tested and assessed by Pruchno among 398 white and 319 black American grandmothers aged 50-83 years (1996-1998).⁵ Based on the assessment of these tools by the research team, they can be used for Persian-speaking population or the elderly of Persian-speaking countries if they are translated and validated. Using a common tool in international studies can help develop the knowledge and methodology required for the study and act in the field of satisfaction and caregiving burden of grandchildren. Thus, the present study aimed to translate and determine the psychometric properties of satisfaction and caregiving burden of grandchildren questionnaires among Iranian grandparents.

Methods

This is a descriptive-analytic study that aimed to validate the English version of satisfaction and caregiving burden

of grandchildren scales among the grandparents. The participants were selected among all grandparents having grandchildren, who referred to different healthcare centres in some cities including Shiraz, Sepidan, Fasa, Jahrom, and Borazjan in the south of Iran during April-August, 2019. Inclusion criterion was the age of grandparent (over 50 years), while unwillingness to participate in the study and the incomplete completion of the questionnaire were the exclusion criteria. The minimum sample size required for conducting factor analysis was 5-10 samples per item. The final sample size was 70 persons by considering the item number and probability of losing data and incomplete answers. All eligible grandparents were assessed using convenience sampling. Researcher-made demographic questions and satisfaction and caregiving burden questionnaires were used to collect the data. The demographic features of the individuals involved age, gender, marital status, education level, pension amount, duration of caring and caregiving grandchildren, and the services provided to grandchildren. The tool of measuring satisfaction and caregiving burden included 8 and 13 questions, respectively, which was designed by Pruchno.⁴ The questions existing in these questionnaires can assess satisfaction and caregiving burden level in the 5-point Likert scale ranging from never to almost always. The responses were scored from 1 to 5 and total score was calculated by summing the obtained scores in order to determine the total satisfaction and caregiving burden, so that the higher scores represent more satisfaction and caregiving burden. The present study was conducted through the following steps. The original versions of the intended questionnaires were prepared and translated based on the protocol suggested by the world health organization (WHO).¹⁵ The original English versions of the questionnaires were translated into Persian by two Persian speaking experts who had adequate experience and proficiency in translating English texts in the first step. Further, building the conceptual equivalent of the words, phrases and sentences of these questionnaires was emphasized. Then, the primary versions translated by the two experts were assessed and discussed and words and phrases were agreed during a meeting with the research team. In the second step, these versions were given to two other experts to measure the translation quality of the prepared Persian version. These experts considered the accuracy of phrases and sentences with respect to rhetoric application of common language, equality of the concepts and total quality of translation for determining the translation quality. Regarding the next step, another expert was asked to translate the Persian version obtained in previous steps into English (back translation). Further, the obtained and original English versions were compared with respect to the equality of the concepts and confirmed during a meeting held with student, thesis supervisor and advisor. The steps of assessing psychometric properties such as the validity and reliability of the satisfaction and caregiving burden questionnaires were as follows.

Structural validity was conducted through explanatory and confirmatory factor analyses by using Varimax rotation and PCA, respectively. Further, parallel analysis was used to determine the number of extractable factors, and Kaiser-Meyer-Olkin measure of sampling adequacy index and Bartlett test were calculated. Furthermore, the extracted factors were assessed through confirmatory factor analysis based on more common goodness-of-fit indexes for structural equation models. Regarding reliability assessment, the internal consistency was evaluated by using Cronbach's coefficient alpha. Internal consistency as an index representing the homogeneity of changes in subscale scores among the sample during a temporal period varies between zero and one, and the scores close to one indicate more internal consistency. Cronbach's coefficient alpha over 0.70 is mostly considered as appropriate. Finally, all analyses were conducted using SPSS 24 and Amos 24 and the normality of data was checked and confirmed by using Kolmogorov-Smirnov and D'Agostino tests.

Ethical Considerations

The present study was conducted based on COPE and Helsinki protocol after obtaining permission from the ethical committee of Shiraz University of Medical Sciences (196-46). Further, all individuals participated in the study with informed consent after describing the objectives of the study.

Results

The mean and standard deviation of the participants' age were determined as 59.40±9.21. Statistical population included 74.3% female and 25.7% male, among whom the education level of 71% and 14.3% was up to diploma and academic, respectively. Further, 38.6% of the participants had underlying disease such as hypertension and diabetes, and 51.4% of them were pensioners. Furthermore, 58.6% of the individuals did all activities such as feeding, bathing, caregiving, walking in the park,

and dressing for their grandchildren. The distribution of total score related to satisfaction and caregiving burden of grandchildren scales was obtained as normal. The results of sampling adequacy index (KMO) and Bartlett test in satisfaction and caregiving burden were obtained as 0.811 and 279.189, and 0.869 and 610.120, respectively, and P<0.001 was significant. In addition, responsibility and happiness as two components of satisfaction, and individual and social as two components of caregiving burden were extracted by using explanatory factor analysis. Further, the special value of two hidden factors related to satisfaction and caregiving burden was obtained as 12.811, 55.314, 11.269 and 53.839, respectively, which could explain 91.127 and 93.105% of the total variance in satisfaction and caregiving burden scales, respectively (Tables 1 and 2). As shown in Table 3, goodness-of-fit indexes of the model confirmed the model fitting. Further, the internal consistency and structural reliability of happiness, responsibility, social and individual factors were obtained as 0.717, 0.859, 0.858, and 0.709, respectively.

Results of Confirmatory Factor Analyses

After accepting the factorial loads and distribution in EFA, its confirmatory factor analysis was conducted. Table 3 summarizes the goodness-of-fit indexes of the model.

As shown in Table 3, fitting the distributing factors of the questionnaire in internal distribution model of questionnaire and quality of its factorial structure was considered as good fitting. Thus, its results were reliable in measuring satisfaction and caregiving burden of grandchildren. Two subscales of happiness and responsibility were identified in caregiving satisfaction by using confirmatory factor analysis (Figure 1).

Further, two subscales of individual and social were identified in caregiving burden by using confirmatory factor analysis (Figure 2).

The cut-off points of two important subscales in

Table 1: Varimax-Rotated Factor in Kaiser Normalization with Principal Component Analysis for Caregiving Burden Scale (BCR)

Items	Component	
	1	2
BCR.13: Other family members have had to do without because of my grandchild.		0.500
BCR.11: Caring for my grandchild doesn't allow me as much privacy as I would like.		0.545
BCR.2: Taking care of my grandchild gives me a "trapped" feeling		0.641
BCR.5: I am very tired as a result of caring for my grandchild.		0.677
BCR.3 Because of the time I spend with my grandchild, I don't have enough time for myself		0.749
BCR.10: I will be unable to care for my grandchild much longer.		0.753
BCR.12: Caring for my grandchild has interfered with the use of space in my home.	0.529	
BCR.4: My social life has suffered because I am caring for my grandchild	0.535	
BCR.6: I feel isolated and alone as a result of caring for my grandchild.	0.825	
BCR.1: I can fit in most of the things I need to do in spite of the time taken by caring for my grandchild.	0.825	
BCR.8: Caring for my grandchild currently affects my relationships with other family Members in a negative way.	0.843	
BCR.7: I have lost control of my life because of caring for my grandchild.	0.846	
BCR.9: My health has suffered because of the care I must give my grandchild.	0.858	

Table 2: Varimax-Rotated Factor in Kaiser Normalization with Principal Component Analysis for Caregiving Satisfaction Scale (SCR)

Items	Component	
	1	2
SCR.6: Taking responsibility for my grandchild really gives my self-esteem a boost.	0.878	
SCR.7: My grandchild's pleasure over some little thing gives me pleasure.	0.718	
SCR.8: Caring for my grandchild gives more meaning to my life.	0.705	
SCR.1: I get a sense of satisfaction from helping my grandchild.	0.704	
SCR.4: He or she is getting proper care.	0.667	
SCR.3: Reassured knowing that as long as I am helping my grandchild.		0.864
SCR.5: I really enjoy being with my grandchild.		0.786
SCR.2: Helping my grandchild has made me feel closer to him/her.		0.556

Table 3: The results of distributing goodness of fit index (70 older adults)

	χ^2	df	$\chi^2/df \leq 3$	P value	AGFI	GFI	RMSEA	RFI	IFI	NFI	PNFI	TLI	CFI
SCR	101.03	68	1.486	0.0001	0.89	0.91	0.084	0.89	0.91	0.90	0.90	0.87	0.91
BCR	84.02	69	1.218	0.0001	0.88	0.90	0.056	0.89	0.90	0.89	0.90	0.88	0.91

Goodness of Fit Indices: Adjusted Goodness of Fit Index (AGFI), Goodness of Fit Index (GFI), Root Mean Square Error of Approximation (RMSEA), Relative Fit Index (RFI), Incremental Fit Index (IFI), Bentler & Bonnet's Normed Fit Index (NFI), Parsimony Normed Fit Index (PNFI), Tucker-Lewis Index (TLI), Confirmatory Fit Index (CFI).

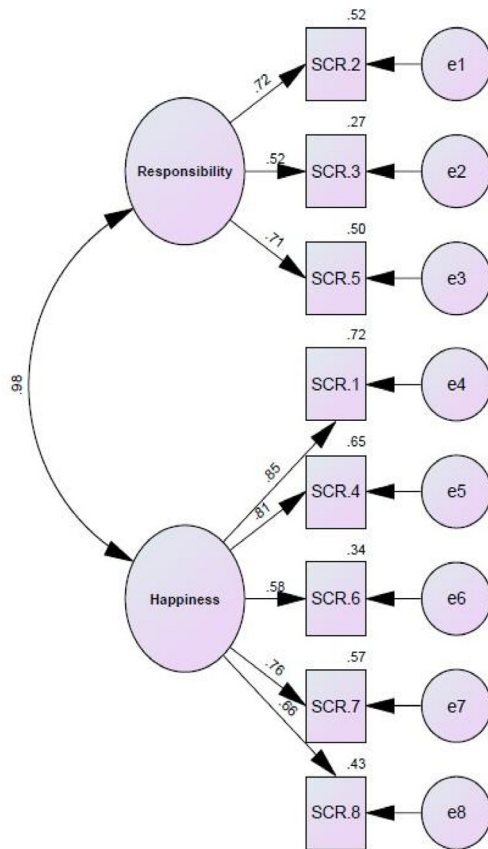


Figure 1: Path diagram of 8-Item caregiving satisfaction scale (SCR) with 2-factor Happiness-Responsibility

satisfaction and caregiving burden were obtained by using the distribution of ROC curve based on Table 4.

The scores of the area under ROC curve indicated the appropriate recognition capability of the scales. Further, the scores of happiness and responsibility-caregiving satisfaction in the SCR, individual and social subdomains in BCR were obtained as 9.5, 15, 17.5, 15.5, 11.5, and 25.5, respectively. Furthermore, chi-squared scores and its squared distance were determined at an appropriate level. The statistical

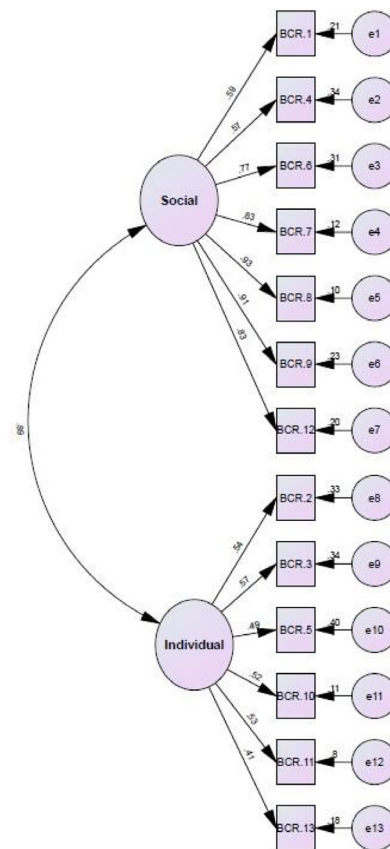


Figure 2: Path diagram of 13-Item caregiving burden (BCR) with 2-factor Social-Individuality

indexes of Youden's J, DIFF, and D-value were used to determine the appropriate cut-off point and acceptance of the area under ROC curve and Youden's J 0.6 and D-value < 0.2 represent the desirability of the cut-off scores of the tool.

Discussion

Based on the results, the validity and reliability of the Persian versions of these questionnaires were appropriate

Table 4: AUC, sensitivity, specificity, and Youden's index for possible cut-off points of subdomains of the Caregiving Burden Scale (BCR) & Caregiving Satisfaction Scale (SCR)

Scale	Subdomains	AUC	95% CI		Mean (SD)	P ^a	Cut-off Point (≥)	Sensitivity	Specificity	Youden's J	D Value	DIFF
			Lower Bound	Upper Bound								
BCR	Social	0.710	0.598	0.822	12.26	0.001	15.5	1	0.754	0.754	0.061	0.246
	Individual	0.643	0.423	0.764	10.09	0.001	11.5	1	0.478	0.478	0.272	0.522
	Total	0.728	0.588	0.818	22.34	0.001	25.5	1	0.232	0.232	0.590	0.768
SCR	Responsibility	0.674	0.532	0.816	13.67	0.001	9.5	1	0.406	0.406	0.353	0.594
	Happiness	0.754	0.641	0.866	23.56	0.001	15	1	0.493	0.493	0.257	0.507
	Total	0.838	0.635	0.942	37.23	0.001	1705	1	0.582	0.580	0.176	0.420

a. Two-sided Chi-squared test, $P \leq 0.05$. Abbreviations: AUC= area under curve; CI = confidence interval; DIFF = $\text{abs}(\text{sensitivity} - \text{specificity})$; D Value = $\text{Sqrt}((1 - \text{Sensitivity})^2 + (1 - \text{Specificity})^2)$.

for measuring satisfaction and caregiving burden of grandchildren level among Iranian grandparents. The present study was conducted among 70 grandparents living in Shiraz, Sepidan, Fasa, Jahrom and Borazjan in 2019. These questionnaires can be used in older adults day care clinics, healthcare centres, and research objectives. Content, face and structural validity and internal reliability were used to validate the questionnaires by representing the proper validity and reliability of these questionnaires. The results of content validity were obtained well-designed based on CVI and the desirability of the content validity related to these questionnaires was confirmed. Based on the results of face validity, the questions were appropriate for grandparents with respect to simplicity, clarity and intelligibility, and the participants could respond the questions easily. The results of construct validity represented appropriate fitting in two dimensions of happiness and responsibility in satisfaction questionnaire and individual and social in caregiving burden of grandchildren questionnaire and a significant relationship between all items and their relevant factor, while no subscale was obtained in the main study. The internal consistency of the Persian versions of these tools was higher compared to that of its original versions, which indicates that the items have adequate homogeneity, measure the same concept and structure in each test, and no conceptual dispersion was observed among these items. These results are similar to those of the original version, by representing the consistency between the items of new and original version. Based on the results related to the reliability of the questionnaires, the obtained Cronbach's alpha was almost similar to those of previous studies, indicating the reliability of these questionnaires. In another study entitled "Validity and reliability of the Persian version of relationship of grandchild-grandparents" questionnaire with 10 items in two dimensions of emotional (representing feelings) and participatory (activities and interactions) used among 505 elementary students, Momtaz et al. (2018) obtained Cronbach's alpha as 0.89.¹⁶ In addition, Khalid et al. (2012) conducted another study entitled "Grandparenting and adolescents' personality development" among 100 girls and 100 boys aged 16-19 years and Cronbach's alpha was reported as 0.72.¹⁷ Further, Jo-Pie et al. (2010)

obtained Cronbach's alpha as 0.75 in another study conducted among 1478 adolescents aged 11-16 years.¹⁸ Calculating the impact factor, content and face validity, and selecting the samples from different counties with different cultures and lifestyles, and lack of validating the items under the study in Iranian studies are regarded as the innovation and difference of the present study compared to previous studies.

Limitations

One of the limitations of the present study is the limited number of samples used. Also, none of the local studies has examined the experience of living with a grandparent or studies that have examined the burden of caring for the elderly and the positive points of living with a grandparent. Parents are not mentioned. Therefore, the researcher inevitably used a limited number of studies in the discussion and conclusion.

Conclusion

Based on the results, the validity and reliability of the Persian versions of satisfaction and caregiving burden questionnaires are appropriate and these questionnaires can be used to assess the level of satisfaction and caregiving burden. It is suggested that further studies should be conducted to validate these questionnaires. Additionally, further studies should be performed in other cultural contexts by considering the difference between cultures and values in the different zones of Iran. Limitations of the present study were the limited number of samples, lack of experience among Iranians living with grandparents, and lack of reporting the positive points of living with grandparents in the studies which assessed the older adults caregiving burden. Thus, the researcher used a few studies in discussion and conclusion sections.

Acknowledgment

The research team of the present study would like to thank the managers of Farzanegan National Foundation,

personnel of Shiraz University of Medical Sciences, healthcare centres, especially the participants for their cooperation.

Conflict of Interest: None declared.

References

- 1 Tang F, Xu L, Chi I, Dong XJJotAGS. Psychological Well-being of Grandparents Caring for Grandchildren among Older Chinese Americans: Burden or Blessing? 2016;64(11):2356.
- 2 E D. Census of Population. social and economic characteristics. 2003.
- 3 Tewari N, Alvarez A. Asian American psychology: current perspectives: Taylor & Francis; 2009.
- 4 Pruchno RJTG. Raising grandchildren: The experiences of black and white grandmothers. 1999;39(2):209-21.
- 5 Pruchno RA, McKenney DJTJoGSBPS, Sciences S. Psychological well-being of Black and White grandmothers raising grandchildren: Examination of a two-factor model. 2002;57(5):P444-P52.
- 6 SHEYKHI MT. A sociological study of health and quality of Life of grandparents in Tehran city. 2012.
- 7 Havighurst RJJTg. Personality and patterns of aging. 1968;8(1_Part_2):20-3.
- 8 Hayslip Jr B, Shore RJ, Henderson CE, Lambert PLJTJoGSBPS, Sciences S. Custodial grandparenting and the impact of grandchildren with problems on role satisfaction and role meaning. 1998;53(3):S164-S73.
- 9 Kaminski P, Hayslip B, editors. Parenting attitudes of custodial grandparents. annual convention of the American Psychological Association, Honolulu, HI; 2004.
- 10 Minkler M, Fuller-Thomson E, Miller D, Driver D. Grandparent caregiving and depression. 2000.
- 11 Jendrek MPJTG. Grandparents who parent their grandchildren: Circumstances and decisions. 1994;34(2):206-16.
- 12 Emick MA, Hayslip Jr BJTIJoA, Development H. Custodial grandparenting: Stresses, coping skills, and relationships with grandchildren. 1999;48(1):35-61.
- 13 Idstad M, Ask H, Tambs KJBPH. Mental disorder and caregiver burden in spouses: the Nord-Trøndelag health study. 2010;10(1):516.
- 14 Strom RD, Lee T-J, Strom PS, Nakagawa K, Beckert TEJEG. Taiwanese grandmothers: Strengths and learning needs as perceived by grandmothers, mothers, and granddaughters. 2008;34(9):812-30.
- 15 Behling O, Law KS. Translating questionnaires and other research instruments: Problems and solutions: Sage; 2000.
- 16 Abolfathi Momtaz Y, Delbari AJIJoA. Validity and Reliability of the Persian Version of Relationship of Grandchild-Grandparents.0-.
- 17 Khalid S, Ahmed F, Imdad MJIPoED, Research. Grandparenting and adolescents' personality development. 2012;48:143-7.
- 18 Tan J-P, Buchanan A, Flouri E, Attar-Schwartz S, Griggs JJoFI. Filling the parenting gap? Grandparent involvement with UK adolescents. 2010;31(7):992-1015.