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Original Article

Reliability and validation of the Positive Aspects of Caregiving scale among Japanese caregivers of people with dementia

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ABSTRACT

Objectives: This study aimed to validate the Positive Aspects of Caregiving(PAC) scale's psychometric properties among Japanese informal caregivers of people with dementia.

Methods: A cross-sectional research design was used. Data were collected from the Kinki region of Japan during January 2019 and July 2019. Translation and back-translation were performed to acquire the optimal translation of the PAC scale. In total, 194 participants responded to questionnaires that included the Japanese version of the PAC scale and the Geriatric Depression Scale (GDS). Reliability was evaluated by examining the internal consistency and test-retest reliability. Exploratory factor analysis with maximum likelihood estimation and oblique rotation was performed to assess the PAC scale structure. Concurrent validity was determined using Pearson's correlation coefficient.

Results: The final version of the Japanese version of the PAC scale contained nine items. Exploratory factor analysis revealed two factors (*Living an enriched life* and *Self-usefulness*). The Cronbach's α coefficient of the total scale was 0.895, the subscales Cronbach's α coefficient were 0.896 and 0.823. The intraclass correlation coefficient for test-retest reliability was 0.721, indicating acceptable reliability. PAC was significantly correlated to GDS ($r = -0.548$, $P < 0.01$).

Conclusions: This study found that the Japanese version of the PAC scale was a suitable scale to measure PAC among Japanese caregivers of people with dementia. However, the construct differed from the original model. This scale could help health-care professionals understand the degree of caregivers' recognition about dementia care and support those with a low degree of positive aspects of caregiving.

What is known?

- The Positive Aspects of Caregiving (PAC) scale has sufficient reliability and validity and has been used to assess caregivers of people with dementia in the world.

What is new?

- We created a 9-item Japanese version of the PAC scale.The PAC scale had sufficient reliability and validity.

- The PAC scale could be expected to enable comparisons with other countries regarding PAC among caregivers of people with dementia.

1. Introduction

Several studies have been conducted to support family caregivers of people with dementia. Research has primarily focused on the negative aspects of caregiving, such as unavoidable burdens [1–9], depression [3,8–10], anxiety [3,9], and anticipatory grief [6]. While many studies have been conducted to identify caregiving burdens [3,5,7,11–17], several others have focused on caregiving's positive aspects (PAC).

Some studies have clarified the usefulness of PAC among caregivers. PAC reduces the stress associated with caregiving and improves outcomes for caregivers [18]. A positive association has been identified between PAC and both well-being and life satisfaction

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among caregivers of people with dementia [19]. Also, PAC was negatively associated with a desire to institutionalize [20]. Furthermore, PAC has been reported to be significantly correlated with behavioral bother, burden, daily care bother, and depression [21]. As PAC are an essential factor in allowing people with dementia to stay in their community as long as possible, they need to be quantified to identify the positive aspects of dementia caregiving.

Some scales have been devised to measure PAC. Lawton et al. (1989) developed a 47-item scale composed of dimensions of what they termed "*caregiving appraisal*", which included subjective burden, caregiving mastery, caregiving satisfaction, cognitive reappraisal, and perceived caregiving impact [22]. Based on this scale, Tarlow et al. (2004) developed a valid and reliable PAC scale having two-factors—"self-affirmation" and "outlook on life"-—based on psychometric analyses [23]. Also, Kate et al. developed a PAC Experience scale composed of 41 items [24].

Tarlow's PAC scale has been used in several Western countries, including the USA [7,23,25,26] and Eastern countries [27,28]. Additionally, the PAC scale has been used to assess caregivers with different cultural backgrounds, such as Whites, Hispanics, African-Americans, and Chinese [27,29]. A systematic review reported that the PAC scale was the most commonly used tool to measure PAC [19]. Therefore, the PAC scale allows a multi-country comparison of PAC. Also, the PAC scale reduces the response burden because it is composed of only nine items. The smaller number of items also means that less time is required to give responses. A simple tool such as the PAC scale could be desirable for caregivers of people with dementia in that it would not lead to additional stress or require much time.

However, few studies have attempted to validate the psychometric properties of the PAC scale in Japan to our knowledge. Considering the increasing number of people with dementia worldwide, the difficulties experienced by caregivers of people with dementia should be anticipated and solved through knowledge of dementia care worldwide, despite cultural differences. This is especially true in Japan, one of the most rapidly aging societies globally, where, because of the traditional custom of filial piety [30], family members are expected to provide increasing support as caregivers to people with dementia in the future. However, family size is shrinking in Japan. The burden of caregiving is expected to be highest for specific family members such as spouses and children. Therefore, how caregivers recognize caregiving among caregivers of people with dementia is one of the critical factors in caregiving continuity. The Japanese version of the PAC scale could help healthcare professionals assess the perception of people with dementia among caregivers as they develop interventions and services to maintain the positive perception of caregiving among such caregivers. These interventions and services for promoting caregiving's positive perception could help other aging societies with traditional filial piety customs. Interventions and services based on the PAC scale could also help caregivers take care of their family members with dementia and allow people with dementia to stay in their community longer. The objectivity of the PAC scale and its ability to facilitate comparisons among countries when needed favors its use on a global scale; therefore, the PAC scale is expected to be increasingly helpful shortly. This study aimed to develop and subsequently test the reliability and validity of a Japanese version of the PAC scale with this background.

2. Material and methods

2.1. Design and participants

A cross-sectional study design was used. Participants were

family caregivers of people with dementia. The inclusion criteria were being a family caregiver of a person with dementia living in the community, being a self-identified primary caregiver, and having the ability to read and understand Japanese. The exclusion criterion was being diagnosed as having dementia or severe psychological disease by a physician.

2.2. Instruments

2.2.1. Japanese version of the PAC scale

The PAC scale translation into Japanese was carried out by referencing a development study on the Chinese version of the PAC scale [28]. The nine English items on the PAC were translated into Japanese by the first author of this study. A native English speaker at a translation company back-translated the Japanese version into another set of English items. The back-translator has more than 16 years of translation experience and translation and illustrates expertise in nursing, medicine, pharmacology, social sciences, psychology, education, sustainable development, and environmental science. Following a comparison between the original and back-translated PAC items by the back-translator, the wording for one thing, "Made me feel more useful", expressed a different means from that on the Japanese version of the PAC. Therefore, the wording on this item was revised. The first author, corresponding author, and seminar members, including master and doctoral course students in gerontological nursing, compared the original and back-translated versions. The final Japanese version of the PAC scale was composed of nine items rated on a five-point ordinal scale ranging from 1 (disagree a lot) through 5 (agree a lot), with a higher score indicating higher PAC. This scale contained two of Tarlow's original dimensions: *self-affirmation* and *outlook on life*.

2.2.2. The Japanese version Geriatric Depression Scale

PAC reduces the stress of caregiving and improves outcomes for caregivers [18]. It was considered that higher PAC would make caregivers less depressive. The Japanese version Geriatric Depression Scale (GDS), short-form, is composed of 15 items and requires respondents to answer dichotomous ("Yes"/"No") questions. This scale has been validated in outpatients [31] and nursing home residents [32]. It has been translated into Japanese and other languages and is currently used worldwide [33—35]. Scores between 0 and 5 are average, whereas scores higher than 5 suggest depression, and scores higher than ten almost always indicate depression.

2.2.3. Demographic data

The following demographic data were collected: the caregiver's age, gender, relation to the people with dementia, educational attainment of caregiver, and caregiving period (Table 1).

2.3. Procedure of data collection

We obtained permission to use and translate the PAC scale from the authors of the original article.

Data were collected from the Kinki region of Japan during January 2019 and July 2019. We selected the study sites based on the recommendation of Nunnally (1978), Gorsuch (1983), and Klein (1994) regarding a minimum sample size of at least 100 for conducting exploratory factor analysis [36—38]. In total, 1,373 facilities related to dementia care, including 872 community general support centers, 206 home-visit nursing stations,101 daycare centers, 94 dementia cafés, and 100 federations for families of people with dementia, were selected as follows. The facilities related to dementia care in the Kinki region were listed and assigned a random number. Their random number then sorted the facilities in

Table 1
Characteristics of study sample ($N = 194$).

Characteristics	n	%
Sex		
Male	46	23.7
Female	148	76.3
Relation with a people with dementia		
Spouse	60	30.9
Daughter	69	35.6
Son	17	8.8
Daughter in law	29	14.9
Other	17	8.7
N/A	2	1.0
Educational attainment of caregiver		
Junior high school or high school	91	46.9
Junior college/technical school	58	29.9
University or above	44	22.6
Other	1	0.5

Note: N/A: not applicable.

ascending order, and the lower random numbers were selected. In total, 500 facilities, including 206 home-visit nursing stations, 100 daycare centers, 94 dementia cafés, and 100 federations for families of people with dementia, were chosen from the lowest random numbers to the above facility number on the facility list. Also, 872 community general support centers and one daycare center were selected from the list because the response rate was still low at two months after sending the questionnaire. We asked these facilities to distribute a questionnaire and document containing an explanation of the study purpose and study methods, and ethical considerations to caregivers of people with dementia. A total of 2,825 questionnaires were mailed to the above facilities.

A second PAC scale was conducted on 53 caregivers of people with dementia four weeks later, during February 2019 and July 2019.

2.4. Data analysis

Internal consistency was measured using Cronbach's α coefficient. An alpha coefficient over 0.70 indicates acceptable internal consistency [39]. An intraclass correlation coefficient (ICC) model was used to evaluate test–retest reliability. An ICC over 0.70 shows sufficient reliability [40]. Exploratory factor analysis (EFA) with maximum likelihood estimation and oblique rotation was performed to assess the PAC scale structure. All data were analyzed using IBM SPSS (version 24; IBM Corporation, Tokyo, Japan).

2.5. Ethical considerations

The research was approved by the authors' university ethics review board (approval Nos. 716 and 80). The study's purposes and ethical considerations were explained to all participants. All participants were also informed that their participation in the study was voluntary. Completing and returning the questionnaire was considered to indicate consent to participate in this study.

3. Results

3.1. Characteristics of participants

In total, 199 responses were obtained (response rate, 7.0%). After excluding five caregivers who did not finish the PAC scale, the analytical sample consisted of 194 caregivers.

Table 1 shows the characteristics of the study participants. Among the 194 participants, 46 were male (24.2%), and the mean age was 64.0 ± 12.1 years. The majority of participants were

daughter caregivers (35.6%) or spouse caregivers (30.9%). Regarding education, 91 caregivers finished junior high school or high school (46.9%), 58 junior college or technical school (29.9%), and 44 universities or above (22.6%). The average length of caregiving experience was 68.7 ± 56.0 months.

3.2. Psychometric properties

3.2.1. Construct of PAC scale-Japanese version

The Kaiser–Meyer–Olkin index was 0.88, and Bartlett's test of sphericity was significant ($\chi^2 = 987.09$, $df = 36$, $P < 0.001$), indicating that the sample in this study was suitable for conducting factor analysis. The EFA employing maximum likelihood estimation with oblique rotation identified two distinct factors. Factor 1, *Living an enriched life*, was composed of items 2 and 6–9, and Factor 2, *Self-usefulness*, was composed of items 1 and 3–5 (Table 2). This construct differed from the original model of the PAC scale. These factors explained 69.5% of the total variance before promax rotation.

3.2.2. Concurrent validity

The PAC and GDS scores' correlation coefficient was significant ($r = -0.548$, $P < 0.01$).

3.2.3. Internal consistency

Cronbach's α coefficients for all nine items and two subscales were 0.895, 0.896, and 0.823, respectively.

3.2.4. Test–retest reliability

In total, 53 participants responded to the second measurement performed four weeks after the first. The ICC was 0.721, indicating acceptable reliability.

4. Discussion

To our knowledge, the Japanese version of the PAC scale developed in the present study is the first valid and reliable scale that enables the PAC of caregivers of people with dementia in other countries to be compared with those of caregivers of people with dementia in Japan. It is well known that caregivers of people with dementia also experience PAC [22,39,41]. We believe that our scale could allow health-care professionals to gain a better understanding of the PAC.

Cronbach's α coefficients for all nine items was 0.895; this value is almost identical to Tarlow's complete scale (Cronbach's α = 0.89). This result suggests that the Japanese version of the PAC scale has sufficient internal consistency, similar to the original scale. Also, the ICC was 0.721, indicating acceptable reliability [40]. This finding suggests that scores on this scale among caregivers of people with dementia are stable for one month. Taken together, these indices suggest that the Japanese version of the PAC scale has sufficient reliability.

As expected, the PAC and GDS correlation coefficient showed a significant negative correlation; this result is consistent with previous studies [23,25,28]. This finding suggests that the Japanese version of the PAC scale has sufficient concurrent validity.

However, the EFA outlined different constructs compared with Tarlow's original scale. In this study, Factor 1 included three items: 'Enabled me to appreciate life more', 'Enabled me to develop a more positive attitude toward life', and 'Strengthened my relationships with others'. These items were the same as the "*Outlook on life*" factor on Tarlow's original scale [23]. This result suggested that Factor 1 in this study can measure the construct of "*Outlook on life*" on the original scale. However, Factor 1 in this study also contained two additional items, 'Made me feel good about myself' and 'Made

Table 2
Two-factor model of the Japanese version of the Positive Aspects of Caregiving scale.

Items (Providing help to care recipient has. . .)	Factor loading	
	Factor 1	Factor 2
8. Enabled me to develop a more positive attitude toward life	**0.919**	−0.003
7. Enabled me to appreciate life more	**0.918**	−0.120
6. Made me feel strong and confident	**0.797**	−0.037
9. Strengthened my relationships with others	**0.625**	0.223
2. Made me feel good about myself	**0.576**	0.168
5. Made me feel important	−0.112	**0.899**
3. Made me feel needed	0.089	**0.753**
4. Made me feel appreciated	−0.021	**0.721**
1. Made me feel more useful	0.167	**0.535**

me feel strong and confident'. These items identified whether caregivers perceive themselves as good, strong, and confident. That is, Factor 1 in this study showed two aspects, outlook on life and self-affirmation. Self-affirmation diminishes biological and psychological responses to stressors and can change cognitive appraisals of events as less threatening and more manageable [42]. A higher self-affirmation was likely to allow caregivers to live a good life. The additional two items seemed to be included in the "*Outlook on life*" factor of Tarlow's original scale in this study for these reasons.

Factor 2 in this study, '*Self-usefulness*', was composed of four items: 'Made me feel important', 'Made me feel needed', 'Made me feel appreciated', and 'Made me feel more useful'. These items identify whether caregivers perceive themselves as necessary, needed, appreciated, and useful for care recipients. Response to these items would be derived from the interrelations between caregivers and people with dementia. When family caregivers do not receive positive feedback from their care recipients, they sometimes experience distress [43]. This factor can be regarded as being constructed with the items focused on interactions between caregivers and people with dementia. For this reason, the two items in Factor 1 of Tarlow's original scale were divided.

In this study, we created a Japanese version of the PAC scale and validated its psychometric properties. Reviews about the PAC have been conducted in the USA, Canada, New Zealand, Europe, including the United Kingdom, East Asia, the Middle East, and Africa [19]; cross-cultural comparisons of the PAC are rare [27]. We believe that our version of the PAC scale will allow researchers and health-care professionals to compare PAC among different cultures.

Also, the valid and reliable scale developed in this study for measuring PAC could help health-care professionals develop interventions and services to maintain or increase the positive perception of caregivers of people with dementia because it would allow them to learn more about perceptions of caregiving. For example, health-care professionals might be able to facilitate PAC by sharing care experiences with caregivers. A low score on this PAC scale, especially for Factor 2, 'Self-usefulness', suggests that the caregiver has lost confidence in his or her caregiving. Health-care professionals might be able to increase PAC by listening to and complimenting caregivers for their daily care. Doris et al. (2018) described a paradigm shift from 'reducing stress' to 'optimizing positive experience' in developing caregiving support services [44]. Health-care providers could develop an empowering approach urging the fostering of self-efficacy on caregiving and encouraging caregivers to continue their daily care by knowing more about caregiving perceptions by caregivers. The Japanese version of the PAC scale could be useful to develop such interventions and services.

5. Limitations

Several limitations of this study should be addressed. First, the response rate in this study was low. The PAC scale is composed of simple items that are easy to read and understand. Although a total of 2,825 questionnaires were sent to 1,373 facilities; however, only 199 responses were received. We think the reason for this was the difficulty experienced in distributing the questionnaires directly to caregivers of people with dementia. Therefore, the actual numbers of distributed questionnaires might not have been enormous. Furthermore, some caregivers of people with dementia may have been too tired from daily caregiving to respond to the questionnaire. Also, it is well known that caregivers of people with dementia experience more significant stress than caregivers of people with other diseases. Rating the PAC could be regarded as assessing caregivers' daily care for people with dementia. Accordingly, it was suspected that some distressed caregivers of people with dementia hesitated to respond to the questionnaire. Therefore, the possibility of a selection bias cannot be ruled out.

Second, we conducted this study only in Japan's Kinki region, which involves six of the 47 prefectures of Japan; therefore, our analytic sample may not represent general dementia family caregivers in Japan. Further studies with a more representative sample are needed.

Third, only the first author translated the PAC scale into Japanese. Therefore, it is difficult to say whether cross-cultural adaptation has been sufficiently tested. Further studies on the terminology used in this scale may therefore be necessary.

6. Conclusion

We developed and confirmed the reliability and validity of a Japanese version of the PAC scale. Our 9-item PAC scale consists of two components: "*Living an enriched life*" and "*Self-usefulness*". This scale could be expected to enable comparisons with other countries regarding PAC among caregivers of people with dementia, although part of the construct differed from the original model. Also, this scale could help health-care professionals understand the degree of caregivers' recognition about dementia care and support those with a low degree of PAC.

Declaration of competing interest

The authors declare that there is no conflict of interest.

CRediT authorship contribution statement

Hidetoshi Furukawa: Conceptualization, Methodology, Investigation, Software, Data curation, Writing - original draft, Writing - review & editing. **Chieko Greiner:** Conceptualization, Methodology, Supervision, Writing - review & editing.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.ijnss.2021.03.007.

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