Development of the Dementia Caregiver Positive Feeling Scale 21-item version (DCPFS-21) in Japan to recognise positive feelings about caregiving for people with dementia

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Abstract

Background: This study aimed to develop and validate the Dementia Caregiver Positive Feeling Scale 21-item version (DCPFS-21) in Japan.

Methods: We selected and generated 27 items based on the preliminary 25-item version of the DCPFS. Next, the DCPFS-21 was developed and validated through two phases. In Phase 1, we obtained data from 147 caregivers of people with dementia by using the 27-item version, examined the construct validity and internal consistency of the scale and then selected 21 items (DCPFS-21). In Phase 2, we compared the scores of 30 caregivers of people with dementia on the DCPFS-21 with the standard scales. Four weeks after the first examination, we re-examined the intra-rater reliability.

Results: In Phase 1, via factor analysis, we reduced the 27 items to 21 items (DCPFS-21). Moreover, the DCPFS-21 was grouped into four subscales, namely, meaning in caregiving, caregiving mastery, positive emotion on caregiving and support from others. This classification agreed with the following factors extracted from the pilot study. The DCPFS-21 showed good internal consistency (Cronbach’s α = 0.92). In Phase 2, the DCPFS-21 correlated with the Caregiving Gratification Scale by 0.54 (P < 0.01). The DCPFS-21 also showed good intra-rater reliability (1.1: ρ = 0.62).

Conclusion: We developed and validated the DCPFS-21, which measures the positive feelings of family caregivers of people with dementia, in Japan.

INTRODUCTION

The number of elderly people with dementia worldwide is rapidly increasing.1,2 To address this issue, the Government of Japan formulated an updated national dementia plan (2019), which recommends that people with dementia should live in familiar environments as much as possible.3 Family caregivers of people with dementia are one of the most important resources for dementia care, considering that many people with dementia are cared for at home. However, family caregivers of people with dementia tend to be more stressed than those of physically impaired elderly,4 and they are at a higher risk for physical health problems.5 Therefore, family caregivers, as well as the people with dementia, must receive adequate support, and psychotherapy is essential to promote emotional health.6 To provide proper support, healthcare providers should first appropriately assess the condition of family caregivers. Although conventional assessment of caregivers focuses on care burden,7 several recent studies have shed light on the importance of caregiving satisfaction,8 meaning,9 self-growth10 and mastery,11 and the Caregiving Gratification Scale (CGS) in assessing the caregivers of people with dementia.12,13 Acknowledging the positive feelings of family caregivers is important to reduce the burden of care and continuing their care.14–16 Therefore, an appropriate scale to measure the positive...
feelings resulting from caregiving is essential. The CGS is a scale for general caregiving. To the best of our knowledge, no scales have been developed in Japan to assess the positive feelings related to dementia care (e.g., caregiving satisfaction, caregiving gratification, and meaning). Furthermore, the positive feelings of dementia caregivers are different from those of caregivers overall, as the former is less likely to receive gratitude due to the unique symptoms of dementia such as a lack of insight and behavioural and psychological symptoms (BPSD). Hence, we developed the Dementia Caregiver Positive Feeling Scale (DCPFS) 25-item version (preliminary scale) to capture the positive feelings specific to dementia caregiving.17

However, the study for developing this 25-item version had several limitations. All participants belonged to the Alzheimer’s Association of Japan, and the study included former caregivers. Although the sample size included in the analysis met criteria (e.g., 100 is considered excellent) as a rule of thumb,18 less than 100 participants were recruited.17 Therefore, the current study aimed to develop the DCPFS based on the preliminary scale17 by examining the construct validity and internal consistency, criterion-related validity based on the external indexes, and intra-rater reliability, with the data from more than 100 participants.

METHODS
Phase 1: Item reduction construct validation study
Participants
We asked care managers to distribute 559 sets of questionnaires to family caregivers of people with dementia in Gunma and Saitama Prefectures (12 municipalities in total). However, it is unknown if all the questionnaires were distributed to family caregivers.

Measurements
Participants completed the following four questionnaires: (i) basic information about the family caregiver; (ii) basic information about the people with dementia; (iii) Activities of Daily Living Inventory for Cognitive Impairment (ADL-cog)19 as an evaluation of cognitive impairment; and (iv) the DCPFS-27.

ADL-cog
The ADL-cog evaluated the severity of dementia. Participants rated each item on a five-point scale ranging from 0 to 4, or not gradable (N).19 The higher the score, the more severe the dementia. The ADL-cog significantly and positively correlated with the Functional Assessment Staging scores ($r = 0.72$). The intra-class correlation coefficient (ICC) of ADL-cog was 0.93.

DCPFS-27
We developed the preliminary version of the DCPFS with 27 items (DCPFS-27) based on the preliminary scale.17 Each DCPFS-27 item was scored on a four-point Likert scale ranging from $1 = \text{strongly disagree}$ to $4 = \text{strongly agree}$. The higher the score, the better the positive feelings.

The development process of the DCPFS-27 was as follows: first, the research project, which focused on the ‘Development of comprehensive BPSD prevention/treatment guideline associated with newly developed BPSD-related scales and positive care for supporting smile life’, defined the positive feelings of caregivers of people with dementia as the ‘situation of experiencing positive feelings by caring for people with dementia’. Next, we discussed and changed the items as follows: (i) the item ‘I have a responsibility for providing care’ was rejected because its meaning could be interpreted as both positive and negative; (ii) two items were added, ‘I can accept everything as it is, even if I fail’ and ‘I have come to think that the care-recipient feels relieved to see me by his/her side’; (iii) the item ‘I have come to praise the care-recipient for accomplishing activities of daily living smoothly (e.g., changing clothes and eating)’ was changed to ‘I have come to praise the care-recipient’ because praising was more important; and (iv) the phrase ‘through the care’ was removed from all items to avoid redundancy. Finally, the DCPFS-27 was approved by the research group.

Statistical analysis
Statistical data were analysed using SPSS Statistics (IBM, Armonk, NY, USA).

Item analysis
Items were analysed using the whole data to examine the percentage of missing values and the item
distribution. Items with >15% of values missing were not retained, and for items in which significant floor or ceiling effects were observed, researchers considered whether those items needed to be retained. Moreover, we calculated the correlation between items and eliminated items with high correlation levels ($\rho > 0.7$). While developing this scale and selecting the items, we emphasised that caregivers could realise more positive aspects of dementia care through the use of the scale.

**Validity (construct validity and factor analysis)**
The factor structure was determined by factor analysis with oblique Promax rotation. We retained the factors with an eigenvalue > 1. The threshold level for factor loading was 0.4.

**Reliability (internal consistency)**
We evaluated the internal consistency through Cronbach’s $\alpha$ and accepted the items that obtained a score of 0.7 or higher.

**Phase 2: collateral validation study**
We conducted Phase 2 to examine the criterion-related validity and internal consistency of the DCPFS-21 derived from Phase 1.

**Participants**
We examined the validation and intra-rater reliability of the DCPFS-21, and the care managers recruited family caregivers of people with dementia by snowball sampling. As Phase 2 included a large number of items, we asked care managers to introduce family caregivers who were considered physically and mentally stable enough to complete the questionnaire.

**Measures**
Participants completed the following five questionnaires: (i) basic information about family caregivers; (ii) basic information about the people with dementia; (iii) CGS;12 (iv) short version of the Japanese version of the Zarit Caregiver Burden Interview (J-ZBI_8);20,21 and (v) DCPFS-21. To evaluate intra-rater reliability, we asked the individuals in the retest group to complete the questionnaire again 4 weeks after the first completion.

**CGS**
The CGS generally evaluated family caregivers’ positive appraisal of their own caregiving. It consisted of eight items, each rated on a four-point Likert scale, with total scores ranging from 0 to 24.12 Higher scores indicate more positive appraisal. The items were organised into two subscales, namely, ‘sense of achievement’ and ‘sense of unity’. The CGS could be clinically used to evaluate the positive appraisal of the caregivers of people with dementia.13

**J-ZBI_8**
The J-ZBI_8 evaluated the care burden of family caregivers. It consisted of eight items, each rated on a five-point Likert scale, with total scores ranging from 0 to 32. Higher scores indicated more care burden.20,21 The items were organised into two subscales, namely, ‘role strain’ and ‘personal strain’.

**Statistical analysis**
Statistical data were analysed using SPSS Statistics (IBM, Armonk, NY, USA).

**Validity (criterion-related validity)**
The validity was analysed by Spearman’s correlation coefficients.

**Reliability (intra-rater reliability)**
The intra-rater reliability was analysed by an ICC of 1.1 in the eligible family caregivers whose care-recipient showed no change in medication and mental condition within 4 weeks.

**Ethics statement**
The ethics committees of the Tokyo Centre for Dementia Care Research and Practices, and Gunma University Graduate School of Health Science approved the study protocol, and an informed consent was obtained from each participant.

**RESULTS**

**Phase 1: item reduction construct validation study**

**Participants**
A total of 147 participants returned the questionnaires via mail (collection rate, 26.3%; 147/559). However, we cannot confirm the number of
questionnaires distributed to the participants, although we asked the care managers to distribute 559 questionnaires. Tables 1 and 2 summarise the demographics of the 147 participants (family caregivers and people with dementia, respectively).

Item analysis

1 Ceiling/floor effect (Table 3): Table 3 lists the descriptive statistics of each item. Although the item ‘I feel relieved to see the care-recipient calming down’ demonstrated ceiling effects (all the participants answered either ‘strongly agree’ or ‘agree a little’), we retained it because it was considered to be highly important from the review. None of the items had more than 15% missing data.

2 Correlation with other items: although the pair of ‘I have come to think that there are meanings behind the care-recipient’s incomprehensible behaviour’ and ‘I feel glad that I am taking care of the care-recipient’ indicated a significantly positive correlation ($\rho = 0.70$), we decided to delete them because they had no similarity.

Validity (construct validity and factor analysis)
The first factor analysis with 27 items was conducted on 138 family caregivers with no missing data (nine family caregivers with missing data were excluded), and six factors were extracted. Bartlett’s test of sphericity was significant at more than 0.01, and the Kaiser–Meyer–Olkin value was 0.88, confirming that the data were suitable for factor analysis. On the second factor analysis, a four-factor structure from the scree plot was assumed, and the Bartlett’s test of sphericity and the Kaiser–Meyer–Olkin value were the same as those on the first factor analysis. The second factor analysis revealed that five items showed factor loadings of less than 0.4 (See Table S1). These five items were as follows: ‘I was able to think about my life in old age’, ‘My family relationship has deepened’, ‘I have come to think that there are meanings behind the care-recipient’s incomprehensible behaviour’, ‘I have come to think that the care-recipient feels relieved to see me by his/her side’ and ‘I can accept everything as it is, even if I fail’. These five items were then excluded. Meanwhile, the item ‘I have come to reach out to people in need’ showed a low factor loading of 0.48, thereby it was also excluded by two researchers. Overall, six items were excluded, leaving 21 items. On the third factor analysis, all 21 items showed sufficient factor loadings. Table 4 lists the items and their factor loadings. The item ‘I have come to deal with the care-recipient’s various behaviours (e.g., memory lapses, wandering) properly’ was included in factor 2 (factor loading = 0.33) from the review. Finally, the DCPFS-21 was developed.

Reliability (internal consistency)
Through the abovementioned analysis, we reduced the 27 items to 21 items. The four factors of the DCPFS-21 were labelled and evaluated as potential subscales as follows: meaning in caregiving (eight items; Cronbach’s $\alpha = 0.88$); caregiving mastery (five items; Cronbach’s $\alpha = 0.85$); positive emotion on caregiving (three items; Cronbach’s $\alpha = 0.76$); and support from others (five items; Cronbach’s $\alpha = 0.74$). The Cronbach’s $\alpha$ of the whole 21 items was 0.92. By eliminating the item ‘I feel relieved to see the care-recipient calming down’ in the category ‘Positive emotion on caregiving,’ Cronbach’s $\alpha$ was increased by 0.04; however, the item was retained because as mentioned above, it was considered to be an important factor in the positive feelings of the caregivers of people with dementia and the Cronbach’s $\alpha$ for the category itself was sufficient.

RESULTS 2
Phase 2: collateral validation study
Participants
In the Phase 2 study, we enrolled 30 participants. For caregivers, the mean age was 62.6 ± 11.9 years, with 22 females and a mean care experience of 6.7 ± 5.6 years. As for mean total scores, the DCPFS-21 was 67.1 ± 5.5, the CGS was 13.8 ± 4.1 and the J-ZBI_8 was 13.1 ± 6.6. For people with dementia, the mean age was 82.5 ± 10.0 years, with 24 females; the dementia status was categorised into dementia secondary to Alzheimer’s disease (16), unknown (six), others (eight). Among these people with dementia, eight, 10, seven and three required care levels one, two, three and five, respectively, and approval was pending for two.

After 4 weeks, 14 consented participants were re-evaluated. Finally, the data from 10 family caregivers whose care-recipients showed no change of...
medication and mental condition during the 4 weeks of the study were used to analyse the intra-rater reliability.

Validity (criterion-related validity)
Table 5 shows the Spearman’s correlation coefficients between the DCPFS-21 (total and subscale), the CGS and the J-ZBI_8.

The DCPFS-21 total scores showed significant and positive correlations with the CGS total scores ($\rho = 0.54$, $P = 0.002$) and with the scores of the CGS subscale ‘sense of unity’ ($\rho = 0.57$, $P = 0.001$). Conversely, the J-ZBI_8 total and subscale scores did not demonstrate significance.

The scores for ‘meaning in caregiving’ correlated with the CGS total scores ($\rho = 0.39$, $P = 0.03$) and the scores of the CGS subscale ‘sense of unity’ ($\rho = 0.54$, $P = 0.002$). The ‘positive emotion on caregiving’ scores also correlated with the ‘sense of unity’ scores ($\rho = 0.40$, $P = 0.03$). The ‘support from others’ scores correlated with the total scores of J-ZBI_8 ($\rho = 0.41$, $P = 0.02$) and with the J-ZBI_8 subscales for role strain ($\rho = 0.36$, $P = 0.048$) and personal strain ($\rho = 0.41$, $P = 0.03$).

Reliability (intra-rater reliability)
The DCPFS-21 scores showed good intra-rater reliability (ICC $1.1 = 0.62$) as did the following four potential subscales: meaning in caregiving (ICC $1.1 = 0.39$), caregiving mastery (ICC $1.1 = 0.46$), support from others (ICC $1.1 = 0.63$) and positive emotion on caregiving (ICC $1.1 = 0.79$).
Table 3: Responses for the Dementia Caregiver Positive Feeling Scale 27-item version in Phase 1 of the study

| Item                                                                 | Strongly agree | Agree a little | Disagree a little | Strongly disagree | Mean ± SD | n (%) | Missing data |
|---------------------------------------------------------------------|----------------|----------------|-------------------|--------------------|-----------|-------|--------------|
| I feel relieved to see the care-recipient calming down.             | 109 (74.1)     | 38 (25.9)      | 0                 | 3.7 ± 0.4          | 0         |       |              |
| I feel glad to see the care-recipient’s smile.                     | 84 (57.1)      | 51 (34.7)      | 9 (6.1)           | 3.0 ± 0.7          | 0         |       |              |
| I feel glad to see the care-recipient accomplishing activities     | 82 (55.8)      | 52 (35.4)      | 10 (6.8)          | 3.2 ± 0.7          | 0         |       |              |
| of daily living smoothly (e.g., changing clothes, eating).         |                |                |                   |                    |           |       |              |
| I was able to think about my life in old age.                      | 77 (52.7)      | 51 (34.7)      | 16 (10.9)         | 3.4 ± 0.8          | 0         |       |              |
| I have got room to breathe by using the long-term care service.    | 73 (50.3)      | 56 (38.6)      | 10 (6.9)          | 3.3 ± 0.9          | 2         |       |              |
| I was able to meet reliable medical/welfare professionals.         | 60 (41.1)      | 71 (48.6)      | 12 (8.2)          | 3.3 ± 0.8          | 1         |       |              |
| I feel better after talking with a person in the same situation as | 65 (44.2)      | 56 (38.1)      | 23 (15.6)         | 3.2 ± 0.8          | 0         |       |              |
| myself.                                                             |                |                |                   |                    |           |       |              |
| I feel glad to see the care-recipient accomplishing                  | 62 (42.2)      | 57 (38.8)      | 22 (15.0)         | 3.2 ± 0.8          | 0         |       |              |
| I have come to think that the care-recipient feels relieved         | 42 (28.6)      | 81 (55.1)      | 22 (15.0)         | 3.1 ± 0.7          | 0         |       |              |
| to see me by his/her side.                                         |                |                |                   |                    |           |       |              |
| I have come to think that there are meanings behind the care-       | 40 (27.4)      | 73 (50.0)      | 30 (20.5)         | 3.0 ± 0.8          | 1         |       |              |
| recipient’s incomprehensible behaviour.                            |                |                |                   |                    |           |       |              |
| I have come to reach out to people in need.                        | 31 (21.1)      | 84 (57.1)      | 28 (19.0)         | 3.0 ± 0.7          | 0         |       |              |
| I have gone to study more for providing better care.               | 27 (18.4)      | 87 (59.2)      | 29 (19.7)         | 2.9 ± 0.7          | 0         |       |              |
| I feel glad that the care-recipient is here.                       | 33 (22.4)      | 75 (51.0)      | 32 (21.8)         | 2.9 ± 0.8          | 0         |       |              |
| I feel glad that I am taking care of the care-recipient.            | 37 (25.2)      | 68 (46.3)      | 32 (21.8)         | 2.9 ± 0.9          | 0         |       |              |
| I can accept everything as it is, even if I fail.                  | 39 (26.5)      | 62 (42.2)      | 34 (23.1)         | 2.9 ± 0.9          | 0         |       |              |
| My family has deepened.                                            | 22 (15.1)      | 88 (60.3)      | 32 (21.9)         | 2.9 ± 0.7          | 1         |       |              |
| I think caregiving is a way to return the favours to the            | 29 (19.7)      | 66 (44.9)      | 47 (32.0)         | 2.8 ± 0.8          | 0         |       |              |
| care-recipient.                                                     |                |                |                   |                    |           |       |              |
| I have come to listen deeply to the care-recipient.                | 30 (20.7)      | 71 (49.0)      | 35 (24.1)         | 2.8 ± 0.9          | 2         |       |              |
| I think caregiving is a way to return the favours to the            | 31 (21.4)      | 70 (48.3)      | 31 (21.4)         | 2.8 ± 0.9          | 2         |       |              |
| care-recipient.                                                     |                |                |                   |                    |           |       |              |
| I learned from the care-recipient.                                 | 32 (21.8)      | 64 (43.5)      | 36 (24.5)         | 2.8 ± 0.9          | 0         |       |              |
| I have come to think that there are meanings in my life.           | 33 (22.4)      | 59 (40.1)      | 43 (29.3)         | 2.8 ± 0.9          | 0         |       |              |
| My family has moved toward a deeper understanding of dementia.     | 27 (18.4)      | 67 (45.6)      | 45 (30.6)         | 2.8 ± 0.8          | 0         |       |              |
| When the care-recipient repeatedly asks the same                   | 32 (22.1)      | 61 (42.1)      | 41 (28.3)         | 2.8 ± 0.9          | 2         |       |              |
| questions, I have come to answer them each time as if for the      |                |                |                   |                    |           |       |              |
| the first time.                                                    |                |                |                   |                    |           |       |              |
| I have obtained perseverance.                                      | 28 (19.1)      | 64 (43.5)      | 45 (30.6)         | 2.7 ± 0.9          | 1         |       |              |
| I have come to praise the care-recipient.                          | 26 (17.7)      | 58 (38.5)      | 56 (38.1)         | 2.7 ± 0.8          | 0         |       |              |
| I discovered a new side of the care-recipient.                     | 16 (10.9)      | 55 (37.4)      | 61 (41.5)         | 2.5 ± 0.8          | 0         |       |              |
| My relationship with the care-recipient has deepened.              | 20 (13.6)      | 48 (32.7)      | 60 (40.8)         | 2.5 ± 0.9          | 0         |       |              |

Missing data were rejected from the answer rates of the preliminary 27-item scale.

DISCUSSION

Validity

We developed the DCPFS-21 from the preliminary version DCPFS-25. The DCPFS-21 was divided into four subscales, namely, meaning in caregiving, caregiving mastery, positive emotion on caregiving and support from others. This division agreed with the following factors extracted from the pilot study: caregiving mastery, support from others, positive emotion on caregiving, family relationship and meaning in caregiving; however, the family relationship factor was included in the ‘support from others’ of the DCPFS-21. Moreover, the four subscales and 21 items of the DCPFS-21 were similar to the following 10 themes related to the positive gains identified in the study of 669 diary recordings over an 8-week period: (i) learning about dementia and accepting the condition; (ii) having a sense of purpose and commitment to the caregiving role; (iii) feeling grateful when the care-recipient was functioning relatively well; (iv) mastering skills on handling the care-recipient; (v) having increased patience and tolerance; (vi) cultivating positive meanings and humour amid difficult circumstances; (vii) letting go of things, such
as when the care-recipient’s qualities had been lost or personal agenda had become unrealistic; (viii) developing a closer relationship with the care-recipient; (ix) finding support; and (x) feeling useful when helping other caregivers.22 Our results resembled the domains in previous studies describing the positive aspects of

Table 4 Component factors of the Dementia Caregiver Positive Feeling Scale 21-item version in Phase 1 of the study (n = 138)

| Item                                                                 | Factor loadings       |
|----------------------------------------------------------------------|-----------------------|
| I feel glad that I am taking care of the care-recipient              | 0.707 0.212 0.006 –0.009 |
| My relationship with the care-recipient has deepened                 | 0.699 0.034 –0.154 –0.067 |
| I think caregiving is a way to return the favour to the care-recipient| 0.668 –0.269 –0.159 0.189 |
| I feel glad that the care-recipient is here                          | 0.667 –0.026 –0.231 –0.117 |
| I learned from the care-recipient                                   | 0.668 –0.269 –0.159 0.189 |
| I have come to think that there are meanings in my life              | 0.626 0.133 0.070 0.162 |
| I have obtained perseverance                                       | 0.596 0.067 0.168 0.143 |
| I discovered a new side of the care-recipient                       | 0.485 0.124 –0.094 0.033 |
| I have come to praise the care-recipient                            | 0.165 0.738 –0.093 –0.108 |
| When the care-recipient repeatedly asks the same questions, I have to answer them each time as if for the first time | –0.019 0.687 0.053 0.155 |
| I have come to study more for providing better care                 | 0.111 0.658 –0.146 0.106 |
| I have come to deal with the care-recipient’s various behaviours (e.g., memory lapses, wandering) properly | –0.053 0.301 –0.068 0.505 |
| I feel glad to see the care-recipient’s smile                        | 0.143 0.096 –0.800 –0.053 |
| I feel glad to see the care-recipient accomplishing activities of daily living smoothly (e.g., changing clothes, eating) | 0.025 0.038 –0.725 0.073 |
| I feel relieved to see the care-recipient calming down               | 0.035 0.031 –0.453 0.188 |
| My family moved toward a deeper understanding of dementia           | 0.096 0.044 0.014 0.622 |
| I feel better after talking with a person in the same situation as myself | –0.012 0.027 –0.144 0.605 |
| I have got room to breathe by using the long-term care service       | 0.300 –0.120 0.091 0.559 |
| My neighbours moved toward a deeper understanding of dementia        | –0.054 0.042 –0.117 0.516 |
| I was able to meet a reliable medical/welfare professional          | 0.082 0.149 0.033 0.433 |

Factor analysis was conducted with the oblique Promax rotation. Bartlett’s test of sphericity was significant at <0.01, and the Kaiser–Meyer–Olkin value was 0.88. The 21-item version obtained a Cronbach’s α value of 0.92.

Table 5 Criterion-related validity of the Dementia Caregiver Positive Feeling Scale 21-item (DCPFS-21) version in Phase 2 of the study (n = 30)

| Spearman’s ρ          | CGS                  | Sense of achievement (CGS) | Sense of unity (CGS) | J-ZBI_8 | Role strain (J-ZBI_8) | Personal strain (J-ZBI_8) |
|-----------------------|----------------------|---------------------------|---------------------|---------|-----------------------|---------------------------|
| DCPFS-21              | 0.54**               | 0.34 (P = 0.07)           | 0.57**              | 0.32    | 0.31                  | 0.26                      |
| Meaning in caregiving | 0.39*                | 0.18                      | 0.54**              | 0.08    | 0.02                  | 0.07                      |
| Caregiving mastery    | 0.26                  | 0.07                      | 0.33                | 0.23    | 0.31                  | 0.13                      |
| Positive emotion on caregiving | 0.26 | 0.04          | 0.40*              | 0.08    | 0.10                  | 0.05                      |
| Support from others   | 0.28                  | 0.32                      | 0.11                | 0.41*   | 0.36*                 | 0.41*                     |

*P < 0.05 indicates significance. **P < 0.01 indicates significance. CGS, Caregiving Gratification Scale, J-ZBI_8: Japanese version of the Zarit Care Burden Interview.
caring for people with dementia.\textsuperscript{23} The previous studies also agreed with our analysis of the positive diaries in which the family caregivers of people with dementia described three good things with reasons and self-praising statements.\textsuperscript{24} The DCPFS-21 scores correlated with the CGS and its subscales, indicating the usefulness of this scale to these family caregivers.\textsuperscript{13} Therefore, the DCPFS-21, which consisted of four subscales, was sufficiently valid. Meanwhile, DCPFS-21 had no significant correlation with J-ZBI_8. Previous literature on well-being and attitude argued that positive and negative aspects were not necessarily polar opposites and could be independent from each other\textsuperscript{25,26} or even coexist.\textsuperscript{27,28} In a Chinese study, the positive aspects of the caregiving scale were not significantly related to caregiver burden, and caregivers could experience high levels of positive appraisal despite having feelings of burden.\textsuperscript{28} Therefore, a positive feeling was an independent factor from burden,\textsuperscript{6,25,26} consistent with the current result.

The positive aspects of caregiving were related to the caregiver's relationship to the care-recipient.\textsuperscript{29–32} For example, wives of the eldest sons (caregivers of mothers-in-law) tended to think negative thoughts about caregiving\textsuperscript{29} and be less open-minded about caregiving.\textsuperscript{31} However, we could not analyse the relationship between family caregivers and people with dementia, because this study mainly aimed to develop a new scale and the number of subjects was excessively small. Hence, the correlation of DCPFS-21 with these other factors should be investigated in the future.

Reliability

The DCPFS-21 showed good intra-rater reliability,\textsuperscript{33} and the Cronbach's $\alpha$ coefficient for the 21 items and the subscales ranged from 0.74 to 0.92, suggesting sufficient reliability.

Limitations

Meanwhile, this study has several limitations. Our results cannot be generalised, because we conducted this research only in limited regions of Japan and purposive sampling was used for selecting participants. Thus, more representative samples are required for further study. However, considering the difficulties associated with directly distributing questionnaires to the caregivers of people with dementia, the response rate was low,\textsuperscript{34} and this problem remains to be solved.

Conclusion

The DCPFS-21 is valid and reliable and is beneficial for recognising positive feelings about caregiving. Although the relevant positive aspects of caregiving scales were developed abroad,\textsuperscript{28,35,36} the development of DCPFS-21 highlighted the feelings of the family caregivers of people with dementia. The Japanese version of the DCPFS-21 can be accessed at the DCnet (https://www.dcnet.gr.jp/support/bpsd/) as well as at another website (https://www.bpsd-web.com/index.html). By measuring positive feelings using the DCPFS-21 as well as by evaluating care burden, the feelings of family caregivers of people with dementia can be assessed comprehensively. We hope that our research results will be widely recognised by professionals as well as add value to the general public.

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DISCLOSURE STATEMENT

The authors have no potential conflicts of interest to disclose.

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**SUPPORTING INFORMATION**

Additional supporting information may be found in the online version of this article at the publisher’s website: http://onlinelibrary.wiley.com/doi//suppinfo.

**Table S1** The result of second factor analysis of the Dementia Caregiver Positive Feeling Scale 21-item version (DCPFS-21) in Phase 1 of the study (n = 138)