Professional care team burden scale: cross-cultural adaptation and psychometric properties of the Turkish version

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Introduction: Care teams in nursing homes have to meet the expectations of the people they care for, their relatives and the institutions. This affects the quality of the care. An increased care burden may negatively affect the quality of work, lives and the health of formal caregivers.
Objectives: This methodological cross-sectional study was conducted to adapt the Professional Care Team Burden (PCTB) Scale, which was developed to assess the difficulties experienced by caregivers working in long-term care, to Turkish and test its validity and reliability.
Material and method: The study was conducted with 100 caregivers working at a nursing home and rehabilitation centre. The Caregiver Information Form and the Professional Care Team Burden Scale were used to collect data. The language and content validity, construct validity and reliability of the Turkish version of the scale were tested, respectively.

Results: The factor analysis showed that the Professional Care Team Burden Scale could be used in two dimensions. When the test–retest was done, the reliability of the scale was found to be high (0.982). The construct validity of the scale showed that the three-factor model did not acceptably fit the data, while the two-dimensional model obtained by removing some of the variables from the model did fit the data (RMSEA = 0.106, GFI = 0.933, CFI = 0.916, IFI = 0.919, RFI = 0.778 and RMR = 0.078). The factor loadings for the construct validity of the scale demonstrated that the two-factor model showed an acceptable fit.
Conclusions: The study found that the two-factor Turkish version of the Professional Care Team Burden Scale met the validity and reliability criteria. The scale, which has an important place in the assessment of the formal caregivers' burden, can be used with healthcare professionals providing care for older adults.

Keywords: Professional Care Team Burden Scale, methodology, caregiver, caregiver burden.

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Introduction

Ageing and elderly care play an important role in the course of an individual's life (1). Although ageing is a natural process, continuously ageing population in society leads to various problems (2). Turkey is a rapidly ageing country (3). Placing old people in nursing homes used to be a subject of criticism, but is now accepted and sometimes even seen as desirable. Thus, professional caregivers should be prepared for caring for older adults, which is no longer an option but a critical requirement.

Different problems experienced by older adults may increase the burden of caregivers (4). The health needs of the professionals serving these individuals are considered an important issue to be addressed in the future due to an increase in institutional care (5,6). Healthcare personnel working in these environments may be under pressure due to intense stress and heavy workloads (7–9). Work-related stress and increased burdens may lead to burnout and low motivation (10,11), which will affect the quality of care and the work–life balance of healthcare personnel. Care burden, which is an important factor for the health of care staff, is generally defined as changes in the physical and psychological health of caregivers, especially when caregiving is of higher importance and requires extra effort although the resources stay the same (12).

As seen in the literature, care burden has particularly been investigated through studies conducted with primary family caregivers, which recommended developing counselling and support programmes and assessing care burden regularly (13,14). Primary caregivers face many challenges. They include emotional stress, physical illness, problems with participating in social activities, challenges in relations with family members and difficulties

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in working life and economic conditions (15–17). The care burden of informal (family members) caregivers in Turkey has been assessed in several studies using several scales (18–20). However, no scales have been found to assess the care burden of formal caregivers providing care to older adults. Our literature review showed that a validity and reliability study of the Turkish version of the PCTB scale had yet to be conducted. The aim of this study was to contribute to the literature with a tool that assesses the burden of caregivers working in nursing homes considering the perceptual and intellectual dynamics rather than focusing only on the physiopathological dimensions of old age.

Material and methods

Data for this methodological and cross-sectional study were collected between March and May 2019. The population of the study consisted of caregivers working in an elderly care and rehabilitation centre. Consistent with the recommendation of Tavşancıl (2002) that the sample size should be at least five or even 10 times the number of items/variables (21), the sample size was 10 times the number of the items (22). Caregivers working in nursing homes in Turkey are defined as paid employees who take care of older adults living in care institutions. Their levels of education vary. They can work in care institutions after completing a short- or long-term training programme (23).

Data collection instruments

Personal information form. The personal information form included questions about gender, age, education and job title.

Professional care team burden scale. The PCTB scale, developed in 2015 by Auer et al., is used to assess the burden experienced by caregivers working in nursing homes. The scale questionnaire, which can be filled by the caregiver or the researcher through asking questions, consisted of 10 statements that attempt to determine the effects of caregiving on the life of the individual. The items are rated on a five-point Likert scale ranging from 'strongly disagree' (1) to 'strongly agree' (5). The lowest and highest scores that can be obtained from the scale were 0 and 40. In the original study, the internal consistency coefficient was 0.785. The items on the scale are categorised into structural, objective and subjective burden dimensions, and a higher scale score indicates a higher level of burden (24).

Translation and cross-cultural adaptation of the scale. The PCTB scale was translated into Turkish by four faculty members who worked in the field of nursing and knew English well. The four translations were combined by the researchers, and a consensus was reached on the scale items. Then, a language expert who knew both English and Turkish at native level implemented the forward–backward translation technique on the scale items (25–27). Brislin's translation model was used to test the language, culture and content validity of the scale. The expert compared the original version of the scale and the version translated into English in meaning and similarity and confirmed that the back-translated scale was equivalent to the original scale (28). The cultural appropriateness of the scale was reviewed by the authors through conceptual analysis, and no changes were made.

Data collection

The data were collected through individual interviews on a voluntary basis. The Professional Care Team Burden Scale and personal information form were used for data collection. Participants' written consent was obtained after they were informed about the research verbally and in writing and that they could withdraw from the study at any time without giving reasons. A pilot study was carried out with 20 employees to test the comprehensibility of the scale (29); no change was made to the scale as each item was found to be understandable.

Ethical considerations

In order to test the validity and reliability of the Turkish version of the Professional Care Team Burden Scale, written permission was obtained from the authors for both the original form and the reliability–validity analysis of the scale. Ethical approval was obtained from the Ethics Committee (410546). The researchers collected data through face-to-face interviews, and it took about five minutes to complete the forms for each employee.

Statistical analysis

Data management and analysis were performed using spss software (version 23). Frequency, percentage, mean and maximum/minimum values were calculated using descriptive statistics to define the variables. The content validity ratio (CVR) and the content validity index (CVI) were calculated to determine the content validity of the scale. The exploratory factor analysis (EFA) and the confirmatory factor analysis (CFA) techniques were used for the construct validity analysis. The principal component analysis was used in the exploratory factor analysis. The Bartlett's sphericity test and Kaiser–Meyer–Olkin tests were used to determine the adequacy of the scale content and sample size. The factor structure and loadings of the scale were analysed with confirmatory factor analysis. A path diagram was created for the scale with the help of the AMOS 24 software. The *t*-test and the Pearson's

correlation test were used in paired groups to determine the relationship between the repeated measurements.

Results

About 67% of the participants were female, and 33% were male. The mean age of the participants was 43.0 (min = 22, max = 57). About 10% of the caregivers were nurses, and 90% were care staff who provided care to older adults. The average work experience of the participants at their current institution was 9.1 years (min = 1 year, max = 22 years). About 28.2% of the participants were high school graduates, 37.3% were middle school graduates, 24.5% were primary school graduates and 10% were two-year college or bachelor's degree graduates.

Reliability

Cronbach's alpha coefficient was used for testing the reliability of the scale. The total item correlation analysis was used to determine the internal validity of the items (30,31). The test–retest mean scores of the scale were compared to determine whether the scale was consistent over time. The Pearson's correlation test was used to see the degree and significance of the relationship between these two measurements. When we reached the total number of the sample (n = 100), 20 randomly selected employees from this sample were assessed on the scale for the second time after a four-week interval (21,29,30).

The Cronbach's alpha value of the scale was found to be 0.752. Item-total statistics were checked to determine how Cronbach's alpha value would change if any item was removed from the scale. The results revealed that the Cronbach's alpha value increased to 0.801 when Item 5 was removed from the scale (Table 1).

The test–retest reliability coefficient of the scale was 0.982 (Table 2). No statistically significant difference was found between the test–retest scores (p > 0.05). The test–retest analysis showed that the reliability of the scale was high (Table 2).

Content validity

The Davis technique (1992) was used to test the content validity of the scale. In this technique, each item is evaluated on a four-point scale: (i) the item is appropriate, (ii) the item needs minor revision, (iii) the item needs major revision or (iv) the item is inappropriate. After the back translation of the scale was completed, an e-mail was sent to seven faculty members who specialised in geriatric nursing to test the content validity of the scale. The faculty members were asked to assess each item on the four-point scale. In the Davis technique, the content validity index, calculated by dividing the number of experts who mark the options a and b for each item by the total number of

Table 1 Item characteristics of the 10-item PCTB scale (N = 100)

Item	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Corrected item-total correlation	Cronbach's alpha if item deleted
Item 1: My work performance is respected by my colleagues	7 (7%)	20 (20%)	13 (13%)	27 (27%)	33 (33%)	0.485	0.693
Item 2: I can discuss work-related issues with my colleagues	4 (4%)	11 (11%)	9 (9%)	43 (43%)	33 (33%)	0.468	0.698
Item 3: The contact with my superiors is good	3 (3%)	6 (6%)	12 (12%)	40 (40%)	39 (39%)	0.512	0.694
Item 4: I can participate in organising the daily routine in my organisation	7 (7%)	9 (9%)	16 (16%)	42 (42%)	26 (26%)	0.525	0.689
Item 5: The loss of ability to communicate in persons with dementia bothers me	21 (21%)	50 (50%)	8 (8%)	11 (11%)	10 (10%)	−0.147	0.801
Item 6: I can manage behaviours resulting from disorientation in persons with dementia	5 (5%)	10 (10%)	12 (12%)	38 (38%)	35 (35%)	0.526	0.689
Item 7: Difficult behaviours (Aggression, Wandering) of persons with dementia are difficult to bear	3 (3%)	66 (66%)	7 (7%)	19 (19%)	5 (5%)	0.148	0.746
Item 8: I can handle constructive critique.	6 (6%)	9 (9%)	11 (11%)	38 (38%)	36 (36%)	0.559	0.683
Item 9: I can keep personal problems out of my daily work routine.	6 (6%)	9 (9%)	12 (12%)	35 (35%)	38 (38%)	0.516	0.689
Item 10: My personal life/family environment is supportive and is able to unburden me	4 (4%)	8 (8%)	13 (13%)	47 (47%)	28 (28%)	0.564	0.685

Corrected r(it) = corrected item-total-correlation. All other items are positively poled: strongly disagree = 4, disagree = 3, neutral = 2, agree = 1 and strongly agree = 0. Negatively poled items (Item Nr. 5 and 7): strongly disagree = 0, disagree = 1, neutral = 2, agree = 3 and strongly agree = 4.

Table 2 Pearson's correlation coefficient for each item in test–retest reliability

Scale item no	
Item 1 – retest Item 1	0.993*
Item 2 – retest Item 2	0.957**
Item 3 – retest Item 3	1
Item 4 –retest Item 4	0.967*
Item 5 –retest Item 5	0.991*
Item 6 –retest Item 6	0.982*
Item 7 –retest Item 7	1
Item 8 –retest Item 8	1
Item 9 –retest Item 9	0.995*
Item 10 –retest Item 10	0.994*
Test total – retest total	0.982**

*Significant correlations at $p < 0.01$ level.
**Significant correlations at $p < 0.05$ level.

experts, were expected to be over 0.80 (28,32,33). The content validity ratios and the content validity index of the scale items were computed as 1.0.

Construct validity

The EFA and the CFA techniques were used to determine whether the scale had construct validity (34). Kaiser–Meyer–Olkin (KMO) and Barlett sphericity tests were implemented to determine the adequacy of the sample size and the suitability of the data in terms of factor analysis (Df: 45, sig: 0.000, Approx. Chi-Square: 328.040).

The KMO value showed that the data were suitable for factor analysis. According to the Bartlett test, the data correlated, which was another indicator of suitability for factor analysis. The factor analysis and rotation component matrix showed that the data gathered around three factors, which explained 61% of the variance in the data (Table 3).

However, when the values were assessed in general, it was found that the model established for the scale was not sufficiently compatible. For this reason, the values of factor loadings were examined to determine the values to be removed from the model. These values are shown in the structure of the model (Fig. 1). There were values lower than 0.5, which were needed to be removed. Thus, these variables were excluded from the model in order, and then the test statistics used for the model fit were calculated. As a result, the second model (Fig. 2) and values were obtained (RMSEA = 0.106, GFI = 0.933, CFI = 0.916, IFI = 0.919, RFI = 0.778 and RMR = 0.078.).

When the construct validity of the scale was examined, it was seen that the three-factor model did not show acceptable fit with the data, but the two-dimensional model obtained by removing some of the variables from the model did fit the data. When we look at the variables of the second factor that needed to be completely removed from the model, we see that these questions were related to people with dementia (Item 5, Item 6, Item 7). The factor loadings for the construct validity of the scale indicated that this two-factor model showed acceptable fit to the data.

Discussion

This study was conducted to adapt the PCTB scale to Turkey and to determine its validity and reliability. It is believed that the adaptation of the scale to Turkey could be beneficial to determining the burden of formal caregivers who care for dementia patients in nursing homes, ensuring better working environments and helping them provide quality service to patients. The factor analysis results obtained through the adaptation of the scale to Turkey differed from the values obtained by Auer et al. The principal components analysis and the confirmatory
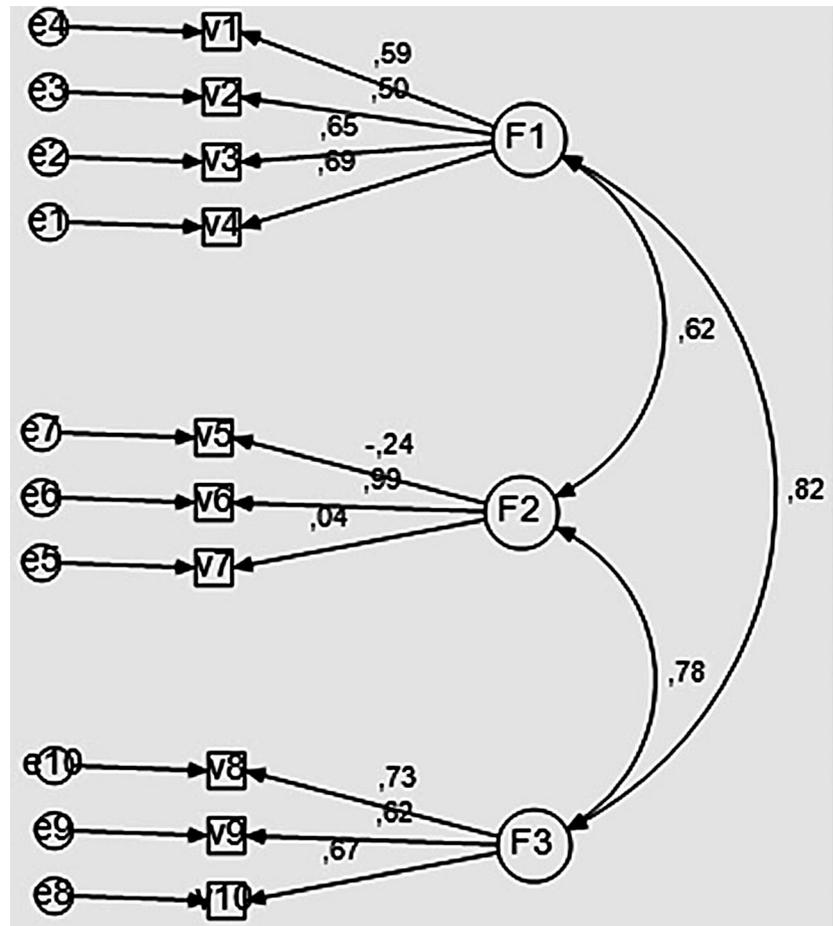
Table 3 Factor eigenvalues and Confirmatory Factor Analysis (CFA)

	Initial eigenvalues			Rotation sums of squared loadings		
Item	Eigenvalues	% of Variance	Cumulative variance %	After rotation Eigenvalues	After rotation Variance %	Cumulative variance %
1	3.741	37.413	37.413	2.475	24.749	24.749
2	1.366	13.664	51.077	2.275	22.754	47.503
3	1.003	10.029	61.106	1.360	13.603	61.106
4	0.935	9.355	70.461			
5	0.806	8.055	78.516			
6	0.616	6.157	84.673			
7	0.541	5.407	90.080			
8	0.413	4.128	94.208			
9	0.328	3.278	97.486			
10	0.251	2.514	100.000			

Extraction Method: Principal Component Analysis.

Figure 1 PCTB scale path diagram 1.

factor analysis conducted to determine the factor structure of the PCTB scale showed that the scale items had a two-factor structure explaining 61% of the variance and that the two-factor model was more compatible with the data. In the literature, ratios of variance between 40 and 60% are considered sufficient. Thus, the variance ratio in this study (61%), which was explained by the scale items under two factors, is considered acceptable (34).

The study findings, which showed that the Turkish version of the PCTB scale had a two-factor structure, were consistent, but did not correspond to the proposed original three-factor structure of the scale (24). When adapting a scale to another language, such results are possible due to differences in culture, linguistics, reactions, etc. When the results were assessed in detail, some factors in the original scale did not work in the present culture. However, since the adaptation of this scale to a different culture was performed for the first time, there is no evidence in the literature that the three-factor structure is preserved in other cultures.

Studies conducted with formal caregivers working with dementia patients have shown that agitation/aggression, and stress levels of caregivers are very high (35). Although a number of factors affecting the level of care

burden on the formal caregivers are explained in the literature (36), no recommendations have been made to address this problem (35). In our study, the caregivers reported that they faced many challenges while caring for older adults. They said that transferring large numbers of older people from their beds or chairs, taking them to the toilet, and feeding them were physically exhausting activities, while dementia-related cases were mentally exhausting. However, contrary to our expectations, these difficulties were not expressed in the responses to the questions about dementia: 50% of the caregivers disagreed with the statement 'The loss of ability to communicate in persons with dementia bothers me', and 66% disagreed with the statement 'Difficult behaviours (aggression, wandering) of persons with dementia are difficult to bear'. These negative questions affected the three-dimensional factor structure of the scale.

A possible explanation for this discrepancy might be the working conditions of the nursing home, or the fact that individuals are concerned about maintaining their daily lives in their existing socio-economic conditions. We accept that the opinions of the formal caregivers on the objective burden factor may differ significantly due to the Turkish culture. This study recommends that the
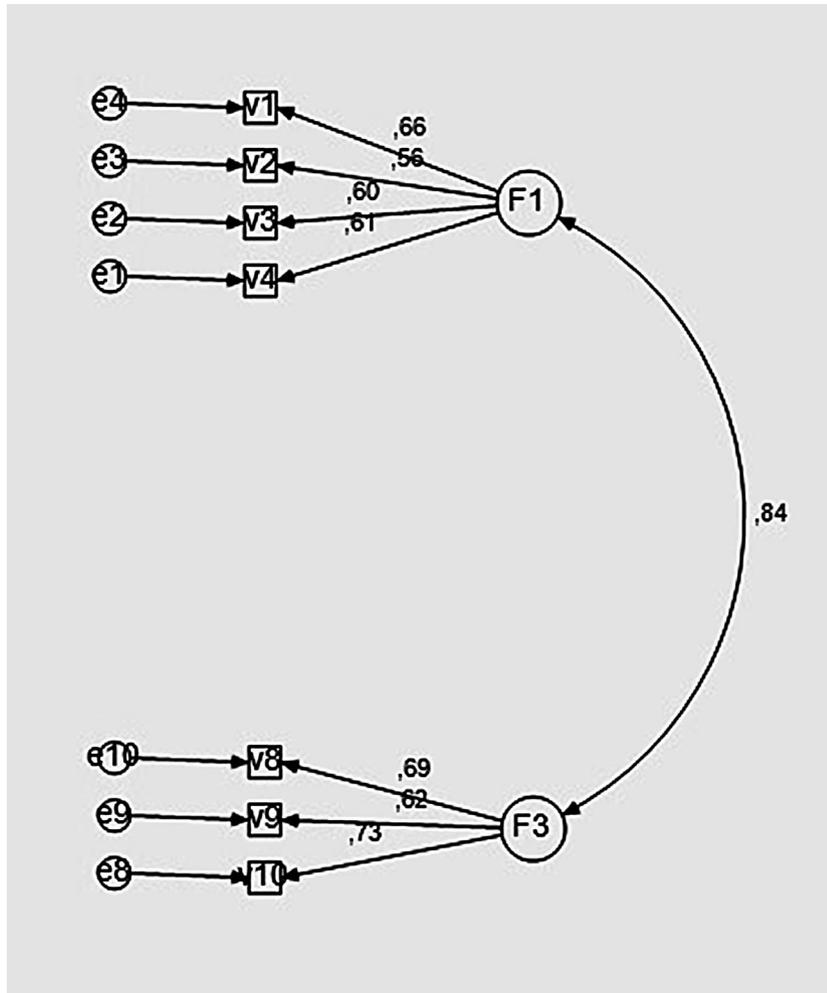
questions under the objective burden factor of the scale should be addressed from a cultural perspective, and comprehensive and multi-faceted studies and discussions should be carried out on the qualitative dimension of these questions with regard to caregivers.

According to the results of the reliability analysis, the Cronbach's alpha internal consistency coefficient of the two subscales of the scale (structural burden and subjective burden) was 0.801. In the original study, the test–retest reliability analysis of the PCTB scale was not performed, but was recommended. The test–retest reliability was high in the Turkish version of the scale (Table 2). This result shows that when performed at different times, the reliability of the scale is high and there is consistency in responses.

The study found that the correlation between the subscale scores of the scale and the total scale score was significant. We therefore conclude that as the results of validity and reliability analyses indicate, the Turkish version of the PCTB scale – including structural burden and subjective burden factors – is a valid and reliable measurement tool.

Limitations

Since intercultural adaptation, validity and reliability analyses of the scale were performed in a different context for the first time, it was not possible to compare the scale results. As the study was cross-sectional, the changes in the responses given for the PCTB scale over time could not be assessed. The study was carried out in a single nursing home, so the results cannot be generalised to all formal caregivers working in long-term care. Longitudinal studies or studies at different periods in different nursing homes and regions of Turkey should be conducted.

Conclusions

The results show that the PCTB scale can be a valuable tool for researchers and employees to assess the burden on caregivers serving older adults. Qualitative and quantitative studies regarding care burden with both groups are needed to reveal the differences of care burden between caregivers and nurses and to identify the factors leading to these differences.

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Author contributions

BK and NKA designed the study, collected and analysed the data and wrote the manuscript.

Ethical approval

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