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## Caregiver Strain Index Psychometric Properties in a Portuguese Sample of Informal Caregivers

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### Introduction

From the role of informal caregiver emerge a set of demands that cause, in many situations, overload [1,2], and this subject has recently gained relevance in Portugal, as a result of legislative initiatives carried out to support this group of people.

The Caregiver Strain Index (CSI) [3,4] is an instrument designed to measure perceived and subjective burden of informal caregivers. It is composed by 13 questions and each answer is marked with one (affirmative answer) or zero (negative answer). Scores higher than or equal to seven suggest high level of burden.

The original scale has good internal consistency (Cronbach's Alpha= 0.86) [4], similar to those found in a Spanish sample ( $\alpha=0.808$ ) [3] and in a Turkish sample ( $\alpha=0.73$  and  $\alpha=0.77$ , in two different moments) [5].

The factorial structure found by several authors differs greatly, both in the number of factors to be retained, and in the items that compose them, due, in large part, to the samples cultural differences and the statistical techniques used, so it is mainly applied as a one-dimensional scale [4–6].

### Methods

Two Portuguese independent translators both fluent in English performed the translation and the retroversion of the original CSI.

A sample of 85 informal caregivers was used, and we evaluated some of the psychometric properties of the scale (reliability and validity) according to the recommendations of Coutinho [7].

### Results

The translation and retroversion of the CSI lead to similar results obtained for the original scale.

Exploratory factor analysis was used to evaluate the CSI construct validity. The Kaiser-Meyer-Olkin test (0.603) shows a mediocre correlation between variables, but still acceptable.

Five factors were extracted (using Principal Components Analysis) with eigenvalues greater than 1, which explain 68.48% of the total variance. The variance plot pointed the retention of these five components. However, two factors saturated only with one item each, so we performed a new factor analysis, forcing three factors, which explained 51.76% of variance.

After eliminating item 8 (saturation below 0.4) and item 3 (saturation in two factors, one of them negative and poorly correlated with the total), the new analysis showed two factors. A first factor (F1), consisting of items 2, 5, 7, 11 and 12, and a second factor (F2), consisting of items 1, 4, 6, 9, 10 and 13, which explained 43.62% of variance (cf. Table 1).

The Cronbach's Alpha for the eleven items scale was  $\alpha=0.66$  (for F1,  $\alpha=0.67$  and for F2,  $\alpha=0.66$ ). The correlations between the total score with F1 was  $r=0.74$  and with F2 was  $r=0.78$ .

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**Table 1** - CSI Principal Component Analysis and Cronbach's Alpha

N.º Item	Itens	Factors	
		1	2
11	There have been work adjustments (e.g.; because of having to take time off)	0.796	
12	It is a financial strain	0.714	
7	There have been other demands on my time (e.g., from other family members)	0.704	
2	It is inconvenient (e.g., because helping takes so much time or it's a long drive over to help)	0.502	
5	There have been family adjustments (e.g., because helping has disrupted routine; there has been no privacy)	0.457	
1	Sleep is disturbed (e.g., because ___ is in and out of bed or wanders around at night)		0.718
9	Some behaviour is upsetting (e.g., because of incontinence; ___ has trouble remembering things; or ___ accuses people of taking things)		0.627
10	It is upsetting to find ___ has changed so much from his/her former self (e.g.; he/she is a different person than he/she used to be)		0.608
13	Feeling completely overwhelmed (e.g.; because of worry about ___; concerns about how you will manage)		0.562
4	It is confining (e.g., helping restricts free time or cannot go visiting)		0.536
6	There have been changes in personal plans (e.g., had to turn down a job; could not go on vacation)	0.516	0.524
Cronbach's alpha (for all items=0.66)		0.67	0.66

The correlation values between the total score of F1 and each of the items of the factor itself varied between 0.56 and 0.73. The correlation values of items belonging to factor 2 with the total score of factor 1 were all greater than 0.2.

For F2 total score, correlations with items belonging to the factor itself varied from 0.55 to 0.70.

## Conclusions

The CSI is a simple instrument to use. However, this study found relevant limitations in a Portuguese version of the scale, concerning its psychometric proprieties. Further work should be done in order to improve reliability and validity indicators.

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