Author's response to reviews

Title: Subjective caregiver burden: validity of the 10-item short version of the Burden Scale for Family Caregivers BSFC-s

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Version: 3
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Author's response to reviews: see over
Resubmission of a revised manuscript for BMC Geriatrics
Validation of the short version of the Burden Scale for Family Caregivers BSFC-s

Dear Ms. Pala,
Dear Dr. Lou,
Dear Prof. Dr. Dr. Rapp,

I am pleased to resend you our revised manuscript entitled “Subjective caregiver burden: validity of the 10-item short version of the Burden Scale for Family Caregivers BSFC-s”.

Please find attached our changes and comments to the reviewers.

We would be pleased if the revised manuscript finds your and the reviewers’ interest.

Yours sincerely,

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1. Reviewer's report

Title: Subjective caregiver burden: validity of the 10-item short version of the Burden Scale for Family Caregivers BSFC-s

Version: 2

Date: 29 November 2013

Reviewer: Michael Rapp

Reviewer's report:

This interesting study examines the consistency, reliability and external validity of a modified brief 10-item version of the Burden Scale for Family Caregivers in a sample of 300+ caregivers of dementia patients. The study is well-designed, the analyses are thorough and the conclusions are supported by the data. The only concern I have is that all the external validity measures included in the study represent ratings and measurements of objective burden, and there is no measure of subjective caregiver burden included. While the associations with such objective measures clearly represent a strength of this study, the lack of a subjective measure of caregiver stress is a limitation that should at least be discussed as such in the Discussion section.

Done - the data of this validation is the outcome of a different study (‘IDA-Project’) that was not designed for the validation of the BSFC-s. The BSFC-s score was the one and only measure to assess the subjective burden of caregivers (p. 21). A new study is undergoing to compare three different measures of subjective burden (CarerQoL questionnaire, Caregiver Strain Index, BSFC-s (p. 21).

Discretionary revisions:

A revision of the English language, especially with regards to the use of definite/indefinite articles, could benefit the paper

Done – the first manuscript was already proof-read by a professional and familiar with the subject native speaker.
2. Reviewer's report

Title: Subjective caregiver burden: validity of the 10-item short version of the Burden Scale for Family Caregivers BSFC-s

Version: 2
Date: 14 December 2013

Reviewer: Vivian W. Q. Lou

Reviewer's report:
This study aimed to validate a 10-item short version of the Burden Scale for Family Caregivers (BSFC) by using a community sample in Germany. Findings supported that BSFC is an economical measure with satisfactory reliability and validity. With strong practical implications for developing an economical measure for caregiving burden, improvement can be made on following concerns.

Background
Since the main purpose of the study is to validate BSFC, it would be desirable if the underlying conceptual model for family caregiving burden can be critically reviewed and discussed.
The conceptual framework of the BSFC/s is based on two models (Caregiver Stress Model, Transactional Stress Model). This is clarified now in the text (p. 6)

In particular, the advantage of composing a summing score to interpreting “total” subjective burden needs to be further elaborated.
This is clarified now in the text (p. 18).

Method
- MMSE was used to measure cognitive impairment but not a diagnostic tool for dementia. On page 8, the authors wrote “Patients were included if they had physician-diagnosed mild or moderate primary dementia ...”; On page 13, the authors wrote “Caregiver burden will be positively correlated with the severity of the dementia syndrome assessed by the MMSE”. It is suggested that the authors clarify this point.

Clarified – Thank you for the constructive feedback. Your concern is legitimate. The diagnosis of a primary dementia was performed by a physician (ICD-10). The cognitive impairment was assessed with the MMSE (p. 8). We changed “the severity of the dementia syndrome” in “the severity of the cognitive impairment” (p. 13).

- The original sample contained 390 cases; while the active sample contained 357 cases. It would be desirable if the authors could clarify who were the drop outs and their characteristics.

We tested the characteristics (see Table A at the end of the cover letter) of the drop outs and caregivers with interview at baseline for median differences (Mann-Whitney and Kruskal-Wallis test) and didn’t find any significant differences (p. 9).
- How did the NOSGER be conducted? Via CATI? If this is the case, would it be possible for any observation bias by family caregivers?
  Clarified – Yes, the NOSGER was conducted via CATI and an observation bias by family caregivers can’t be excluded (p. 21).

Results

- To confirm a one-factor structure of BSFC, confirmatory factor analysis is suggested on top of exploratory factor analysis.
  Clarified – Thank you for the constructive feedback. That was our fault. We only performed an exploratory factor analysis to explore the unknown structure of the BSFC-s. This is clarified now in the text (p. 13). A confirmatory factor analysis would be desirable to perform with a new data set. Therefore an ongoing study compares three different measures of subjective caregiver burden (CarerQoL questionnaire, Caregiver Strain Index, BSFC-s). This is clarified now in the text (p. 21).

- To test H2 (on page 13), the authors wrote (on page 16) “The BSFC-s score correlated higher with the NOSGER subscale for disturbing behavior....”. However, a difference between correlation coefficients does not mean statistical difference; a test on difference between correlation coefficients is suggested. The H2 is corrected now in the text (“Caregiver burden will be positively correlated with the severity of the disturbing behavior assessed by the NOSGER subscale “Disturbing behavior”” (p. 13)).

Discussion

- On page 19, the authors argued that “..., with only half as many items, the BSFC-s is able to measure total caregiver burden as validly as the ZBI”. In order to argue this point, it is suggest that regression models on institutionalization by ZBI and BSFC-s can be computed independently for a comparison.
  Correct - The study of Braun and colleagues [31] didn’t analyze any predictors of institutionalization. We were not able to compare the results in lack of a regression model of institutionalization in their study. This is clarified now in the text (p. 20).

- Since only 32 cases were institutionalized at a follow-up time of 2.5 years, possible limitations of this small size of sample deserve discussion. This is clarified now in the text (p. 19).
Table A. Characteristics of the drop outs and caregivers with interview at baseline

<table>
<thead>
<tr>
<th>Variable</th>
<th>Caregiver interview at baseline</th>
<th>( P^e )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>n = 33</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>n (n%) or</td>
<td>92%</td>
<td></td>
</tr>
<tr>
<td>mean (SD)</td>
<td>n (n%) or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>mean (SD)</td>
<td></td>
</tr>
<tr>
<td>MMSE (^a)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- mild (^b)</td>
<td>25 (76%)</td>
<td>229 (64%)</td>
</tr>
<tr>
<td>- moderate (^c)</td>
<td>8 (24%)</td>
<td>128 (36%)</td>
</tr>
<tr>
<td>Care-receiver's age (years)</td>
<td>82.0 (7.2)</td>
<td>80.2 (6.7)</td>
</tr>
<tr>
<td>Care-receiver's sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- female</td>
<td>25 (76%)</td>
<td>241 (68%)</td>
</tr>
<tr>
<td>- male</td>
<td>8 (24%)</td>
<td>116 (32%)</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- urban (^d)</td>
<td>7 (21%)</td>
<td>88 (25%)</td>
</tr>
<tr>
<td>- rural</td>
<td>26 (79%)</td>
<td>269 (75%)</td>
</tr>
<tr>
<td>Care level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- no</td>
<td>22 (67%)</td>
<td>204 (57%)</td>
</tr>
<tr>
<td>- yes</td>
<td>11 (33%)</td>
<td>153 (43%)</td>
</tr>
<tr>
<td>Depression diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- no</td>
<td>29 (88%)</td>
<td>237 (92%)</td>
</tr>
<tr>
<td>- yes</td>
<td>4 (12%)</td>
<td>30 (8%)</td>
</tr>
</tbody>
</table>

\(^a\) Mini-Mental Status Examination
\(^b\) MMSE: 18-24 points
\(^c\) MMSE: 10-17 points
\(^d\) Urban region: cities with at least 100,000 citizens; rural region: cities with less than 100,000 citizens and villages

\(^e\) \( P \): \( P \) value of testing for median differences (Mann-Whitney or Kruskal-Wallis test)

Other variables were not available for the drop outs (no caregiver interview at baseline): BSFC-s score; caregiver's age (years); caregiver's sex; living situation (together/separately); caregiver's relation with care-receiver (spouse, children/-in-law, other); NOSGER subscale “Disturbing behavior”; NOSGER subscale “IADL”; Barthel Index; caregiving tasks at night; informal caregiving time (hours per day); study arm