The burden of spousal caregiving: A preliminary psychometric evaluation of the German version of the Zarit Burden Interview

Melanie Braun*, Urte Scholz, Rainer Hornung and Mike Martin

Department of Psychology, Social and Health Psychology, University of Zurich, Binzmuehlestr. 14/ Box 14, CH-8050 Zurich, Switzerland

Objectives: Despite a rapid increase in studies dealing with dementia caregivers in Europe, a valid German version of the most widely used measurement of caregiver burden (Zarit Burden Interview) has not yet been published. The purpose of this study is to evaluate the psychometric properties of the German Zarit Burden Interview (G-ZBI).

Method: Twenty-eight community-dwelling older couples with the husband suffering from dementia and the wife being the primary caregiver participated in this study. The G-ZBI and related constructs were assessed in order to test for reliability and construct validity.

Results: The G-ZBI revealed psychometric properties comparable with those of the original instrument and empirically validated translations. Results demonstrated high internal consistency (Cronbach's α 0.92) and good validity due to strong correlations with caregiver life satisfaction and depression, as well as patients' dependency, neuropsychiatric symptoms, and dementia severity.

Conclusion: The psychometric qualities of the G-ZBI indicate that it is both a reliable and valid instrument to assess caregiver burden and to detect highly stressed individuals.

Keywords: burden; dementia caregiving; psychometric evaluation; Zarit Burden Interview; validity

Introduction

Due to increasing life expectancy, a growing number of older couples are confronted with the diagnosis of dementia of the partner. In the German-speaking countries of Central Europe, prevalence rates for dementia reveal that more than 1 million people suffer from dementia in Germany (Deutsche Alzheimer Gesellschaft [German Alzheimer Association], 2006), 98,000 in Switzerland (Schweizerische Alzheimervereinigung [Swiss Alzheimer Association], 2007), and more than 90,000 in Austria (Alf et al., 2006). Due to these increasing prevalences, the number of both familial and spousal caregivers is constantly growing (Schulz & Martire, 2004).

Caring for a spouse with a progressive dementia can be a highly stressful experience associated with negative psychological and physical outcomes. Indeed, many studies have demonstrated negative consequences for spousal caregivers' health and quality of life such as depression, anxiety, and poor immune function (e.g., Pinquart & Soerensen, 2003; Vitaliano, Zhang, & Scanlan, 2003). Furthermore, caregiver burden is known to be associated with severe negative conditions and psychiatric morbidity (Baumgarten et al., 1992). Additionally, negative associations between higher subjective burden and poorer marital quality in spousal caregivers of persons with mild dementia were reported by Garand et al. (2007). However, high burden is not only associated with negative caregiver outcomes, but also with a higher probability of institutionalization of the care receiving person (Rozzini et al., 2006) indicating increasing health care costs. Therefore, the valid identification of extremely stressed caregivers at high risk for both developing negative consequences and institutionalizing the person with dementia is an essential issue in psychological and medical diagnostics. Thus, clinicians and researchers both need reliable and valid measurements of subjective burden to identify factors influencing distress as well as emotional and physical well-being of familial caregivers. Such an instrument would provide essential information for therapeutic and preventive interventions (e.g., Majerovitz, 2007).

Previous studies examining influences of caregiver burden indicated that neuropsychiatric symptoms and problematic behaviors of the patient (e.g., Perren, Schmid, & Wettstein, 2006), depression of the caregiver (e.g., Clyburn, Stones, Hadjistavropoulos, & Tuokko, 2000) as well as relationship quality between the caring and the care receiving person (Knop, Bergman-Evans, & McCabe, 1998) affect the subjective burden of the caregiving person. Unfortunately, research partially revealed equivocal findings due to methodological and conceptual shortcomings (e.g., lack of studies separating caregiver subgroups such as familial versus spousal caregivers, neglect of the dyadic perspective of the caregiver–patient dyad; for details see Braun et al., 2009).

---

*Corresponding author. Email: Melanie.Braun@psychologie.uzh.ch

The most widely used instrument to assess caregiver burden is the Zarit Burden Interview (ZBI) (Zarit, Orr, & Zarit, 1985; Zarit, Reever, & Bach, 1980). The ZBI has been designed for the measurement of subjective burden of familial caregivers of individuals suffering from dementia. Derived from a 29-item preliminary version (Zarit et al., 1980), the ZBI is a 22-item self-report inventory. The 22 questions regard perceived caregiver strain (e.g., "Do you feel that you have lost control of your life because you are caring for your relative?").

These items are answered along a five-point Likert scale with responses from 0 (never) to 4 (nearly always) for degree of endorsement leading to a possible total score of 88. The higher the total score, the higher the level of perceived burden. Different cut-off scores indicating severity level of burden are found in the literature. Zarit and Zarit (1987) proposed interpreting the burden as severe for total scores between 61 and 88, moderate between 41 and 60, mild from 21 to 40 and little or absent for total scores under 21. Several authors criticized these cut-offs since the limits were set arbitrary (e.g., Hébert, Bravo, & Préville, 2000). Lower scores indicating a critical level of caregiver burden (e.g., total scores between 24 and 26 to target caregivers vulnerable to depression) have been recommended (e.g., Schreiner, Morimoti, Arai, & Zarit, 2006).

Several abridged versions of the ZBI have been suggested (for details see O'Rourke and Toukko, 2003). However, a recent study demonstrated that the 22-item format reveals significantly higher reliability estimates than the short forms and the original 29-item form, respectively (Bachner & O'Rourke, 2007). Despite studies that demonstrated multi-factorial structures of responses (e.g., Ankri, Andrieu, Beaufils, Grand, & Henrard, 2005; Hébert et al., 2000; Knight, Fox, & Chou, 2000), correlation coefficients between the ZBI items and factors suggest that the instrument represents a single construct of caregiver burden (Bachner & O'Rourke, 2007).

Previous validation studies using the ZBI in different languages demonstrated satisfactory psychometric properties across different languages and cultures (e.g., Arai et al., 1997; Chan, Lam, & Chiu, 2005; Hébert et al., 2000). However, due to a paucity of intervention studies using the ZBI as an outcome measure, its responsiveness, which is an index of an instrument's sensitivity to change, could not yet clearly be demonstrated (Moniz-Cook et al., 2008).

It is well known that recent data of both translated and original psychological instruments are essentially needed for valid measurements. Updated reliability and validity data are crucial to correctly interpret research findings and to detect factors possibly limiting generalizability of psychometric findings from other studies (O'Rourke, 2004). However, some studies using a translation of the ZBI fail to analyze or publish psychometric properties leading to questionable results and generalizations (Bachner & O'Rourke, 2007).

Aim of the study

Thus, the aim of the present study is the evaluation of the psychometric qualities of the German version of the ZBI (G-ZBI) for assessing the level of burden reported by spousal caregivers of elderly subjects with dementia in Germany and German-speaking parts of Switzerland. To the best of our knowledge, this is the first publication including psychometric analyses of a German translation of the ZBI.

Methods

Adaptation of the ZBI into German

We used the back-translation method as recommended by several authors (e.g., Werner & Campbell, 1970) to evaluate adaptability and validity of the G-ZBI (see Appendix for German items). First, the ZBI was translated into German by one of the authors and back-translated by a professional bilingual translator experienced in translation of psychological instruments. This procedure was repeated once. Next, a panel of experts (professionals with a gerontopsychological and health psychological background) discussed the suitability of the items of the final version (for details about questionnaire translation, see Harkness and Schoua-Glusberg, 1998).

Subjects

This study was part of a longitudinal research project from the Department of Psychology of the University of Zurich about dyadic exchange and well-being of couples with a spouse with dementia. Twenty-eight wives ($N = 28$) with the husband suffering from dementia participated in the baseline analyses. One part of the participants was recruited from five clinical institutions in Switzerland and Germany. Due to difficult recruitment of eligible subjects, advertisements in local newspapers and magazines were additionally used. Baseline data were collected between January 2007 and February 2008. All husbands were professionally diagnosed with dementia, in most cases with Alzheimer's disease. They lived together with their wives as their primary caregivers. Exclusion criteria included alcohol dementia, symptoms that would hinder study participation (e.g., pain, hearing deficits), and suspicion of dementia or cognitive decline of the caring wife. Both patient and caregiver were separately interviewed face to face by a psychologist or a trained masters-level psychology student. The interviewers were present while the participants answered the G-ZBI as a self-completion questionnaire in case assistance was needed or wanted.

The study was approved by the ethics committee of the University of Zurich and the Canton of Zurich.

Measures

We validated the 22-item form since it is considered to be both the most widely used and most reliable version of the ZBI (Bachner & O'Rourke, 2007). Our two main purposes were the assessment of first reliability and second validity estimates of the G-ZBI.

Research clearly supports that neuropsychiatric symptoms (e.g., apathy, depression, agitation) are pathophysiologically associated with dementing illnesses and negatively influence caregiver burden (e.g., Perren et al., 2006). Therefore, the brief Neuropsychiatric Inventory (NPI-Q) (Kaufer et al., 2000), an informant-based interview, was conducted with the caregiving wives to assess psychopathology of their partners. In the NPI-Q, the caregiver ranks the severity of the patient's behavior exhibited on a scale of 1–3, with 3 being the most severe leading to a total severity score for the patient. Additionally, the caregiver reports the subjective level of distress caused by each symptom or behavior on a scale of 1–5 (with 5 indicating the most severe distress level). Consequently, the NPI-Q yields a total distress score consisting of the summed distress ratings obtained for each neuropsychiatric symptom or behavior. Higher total scores indicate greater frequency or severity of the patient's symptoms as well as more distress of the caregiving spouse.

We included the Barthel Index (BI) (Mahoney & Barthel, 1965), a questionnaire conducted with the caring wife, to measure the patient's level of dependency in activities of daily living. Patients with more disability have lower BI scores. Furthermore, the caregivers rated the average number of hours weekly spent on their husbands' care.

Two self-report instruments were included to assess psychological well-being of the caregiving wife: the German version of the Satisfaction with Life Scale (SWLS; Schumacher, 2003) and the German version of the Center for Epidemiological Studies Depression Scale (CES-D; Hautzinger, 1988). The five-item SWLS measures global life satisfaction with higher total scores indicating more life satisfaction. The CES-D is a widely used depression scale consisting of 20 items regarding depressive symptoms that occurred in the past week. Higher total scores represent more depressive symptoms, whereas total scores of 16 or higher are commonly taken as indicative of enhanced risk of clinical depression. Additionally, the CES-D was conducted with the husband to investigate the association between depressive symptoms of the care receiving and stress level of the caregiving person.

The Mini Mental State Examination (MMSE) (German version: Kessler, Markowitsch, & Denzler, 1990) was used as a brief screening instrument to determine level of cognitive function of the spouse with dementia. The MMSE includes 30 questions and tests to assess severity of cognitive impairment. A maximum of 30 points is possible, whereas low scores reveal higher cognitive impairment and greater dementia severity.

Due to lack of sensitivity, the MMSE is not suitable for making a differential diagnosis of dementia (e.g., Grober, Hall, Lipton, & Teresi, 2008), but useful to measure the presence of cognitive impairment of dementia patients at a given time and to screen for dementing illnesses (e.g., Maki et al., 2000).

Means, standard deviations, minimum, and maximum values of the described tools are listed in Table 1.

Sample characteristics

The sample consisted of 28 wives and their spouses suffering from dementia ($N = 28$ couples). On average, the caring wives were 68 years old (SD = 8.63) and married for 41.8 years (SD = 12.76). Almost one-third of them did not get any professional home-care assistance (27.8 %). On average, they spent 88 hours per week on caregiving tasks. All female participants completed the G-ZBI and revealed a mean score of 31.68 (SD = 15.49). The mean CES-D score was 16.75 (SD = 8.12), the wives' SWLS mean was 20.43 (SD = 6.04). Demographic variables of both the caregiving wife and their spouses are presented in Table 1.

On average, husbands were 74 years of age (SD = 7.72) with an MMSE score of 16.75 (SD = 8.12) suggestive of moderate dementia severity. The majority of patients suffered from mild ($N = 11$) and moderate dementia ($N = 10$) with a MMSE median of 17 indicating a borderline value between mild and moderate dementia severity (see Table 1). The NPI-Q revealed a severity mean of 8.61 (SD = 5.77) and a caregiver distress mean of 11.75 (SD = 7.98). The husbands' mean score of the CES-D was 11.50 (SD = 8.49).

Statistical analysis

The psychometric properties of the G-ZBI were evaluated by several analyses. Reliability was estimated by the Cronbach's α coefficient and the split half-correlation coefficient. Validity measures included first, the Spearman's rank order correlation (rs) between the total score of the first 21 items of the ZBI and the 22nd item that assesses a global rating of perceived burden. This correlation was used as a validity estimate in Zarit's original version and previous validation studies (e.g., Arai et al., 1997). Second, correlations between the G-ZBI and the caregiver's depressive symptoms (CES-D), as well as correlations between the G-ZBI and the caregiver's satisfaction with life (SWLS) were calculated as measurements of construct validity. Additionally, to identify possible correlates of caregiver burden, associations with the NPI-Q, dementia severity (MMSE), and level of patients' dependency in activities of daily living (BI) were calculated. Two-tailed tests were used for the statistical analyses, whereas p values less than 0.05 were considered as statistically significant. For most variables, the Kolmogorov–Smirnoff test revealed

Table 1. Sample characteristics.

Characteristic	M	SD	Min	Max	N
Caregiver characteristic					
Age (years)	68.43	8.63	53	92	28
Time married (years)	41.80	12.76	12	68	27
Weekly hours spent caregiving	88.42	63.64	6	168	19
CES-D caregiver	16.75	8.12	1	34	28
SWLS	20.43	6.04	6	29	28
Care receiver characteristic					
Age (years)	74.19	7.72	59	92	26
Time diagnosed	38.85	21.78	1	85	26
Level of dependency (BI)	78.71	17.91	20	95	28
Neuropsychiatric symptoms					
Severity	8.61	5.77	0	20	28
Distress	11.75	7.98	0	28	28
Cognitive function/ MMSE	16.96	8.64	2	28	27
Mild (28-21)					11 (40.7)
Moderate (20-11)					10 (37.1)
Severe (10-0)					6 (22.2)
CES-D husband	11.50	8.49	2	42	24

non-significant results and parametric analyses were appropriate. In case of a significant value, non-parametric analyses were conducted.

Results

Reliability of the G-ZBI

Reliability analyses revealed very good reliability values regarding first, a Guttman split half-correlation coefficient of 0.95 and second, a Cronbach's α of 0.92. The α coefficient of the G-ZBI was not modified by eliminating any of the items (see Table 2). Item characteristics including item discriminatory power (correlation between item and G-ZBI total score) are demonstrated in Table 2.

Validity of the G-ZBI

The correlation between the global question 22 and the total score of the first 21 questions of the G-ZBI revealed high validity estimates ($r = 0.72^{**}$, $p = 0.001$). Furthermore, convergent and divergent validity was evaluated by examining the relations with life satisfaction and depressive symptoms. Caregiver burden was significantly positively correlated with depressive symptoms ($r = 0.72^{**}$, $p = 0.000$) and negatively correlated with life satisfaction ($r = -0.76^{**}$, $p = 0.001$) of the caregiving wife indicating a strong association between lower life satisfaction and higher subjective burden.

Correlates of the G-ZBI

The G-ZBI was significantly correlated with the following variables (see Table 3): severity level of neuropsychiatric symptoms of the husband ($r = 0.58^{**}$, $p = 0.001$) and caregiver distress due to the husbands' neuropsychiatric symptoms ($r = 0.66^{**}$, $p = 0.000$), as

well as level of dependency of the patient ($r = -0.52^{**}$, $p = 0.004$), and dementia severity ($r = -0.43^*$, $p = 0.024$). Additionally, there was a significant correlation between caregiver burden and hours spent caregiving per week ($r = 0.45^*$, $p = 0.05$). No significant, but partially substantial correlations were observed between the G-ZBI score and the age of both the caregiving wife ($r = -0.14$, $p = 0.47$) and the husband with dementia ($r = -0.17$, $p = 0.40$), the years the couples were married ($r = 0.18$, $p = 0.93$), level of depressive symptoms of the husband ($r = 0.08$, $p = 0.70$), duration of dementia ($r = 0.25$, $p = 0.20$), duration of need for care ($r = 0.24$, $p = 0.31$), and hours of help from friends or professional nursing services ($r = 0.39$, $p = 0.10$).

Discussion

Our sample consisted of 28 married couples with the husband suffering from dementia and the wife being the primary caregiver. The caregivers reported a G-ZBI mean score of 31.6, which is comparable to those reported by Zarit et al. (1980) and other validation studies demonstrating mean values between 24.6 (Chan et al., 2005), 32.9 (Ankri et al., 2005), and 38.7 (Arai et al., 1997).

The high internal consistency of the G-ZBI is identical to the internal consistency coefficient reported by Hébert et al. (2000) and comparable to the one of the original version. Furthermore, the G-ZBI revealed a good split half-coefficient which is slightly higher than reliability estimates reported in past studies (e.g., Chan et al., 2005: Hébert et al., 2000). Taken together, the reliability indices of the G-ZBI were shown to be as good as those of the original version and several adequately translated and validated forms.

Validity coefficients also demonstrated good estimates with highly significant correlations between both

Table 2. Item characteristics of the G-ZBI.

G-ZBI item (N = 28)	M G-ZBI	SD	Min	Max	Item 22[a] r^b	Discrim. power[c] r^b	Cronbach's α^d
1. Spouse asks for more help	1.18	1.18	0	4	0.29	0.42	0.92
2. Not enough time for yourself	2.18	1.36	0	4	0.56**	0.81	0.91
3. Meet other responsibilities	1.64	1.16	0	4	0.79**	0.83	0.91
4. Feel embarrassed	1.25	0.92	0	3	0.10	0.42	0.92
5. Feel angry	0.93	0.81	0	3	0.06	0.25	0.92
6. Affects other relationships	0.96	1.10	0	3	$rs^e = 0.29$	0.53	0.92
7. Afraid of the future	2.43	1.06	0	4	0.02	0.27	0.92
8. Spouse depends on you	3.21	1.06	0	4	$rs^e = 0.53**$	0.57	0.91
9. Feel strained	1.36	1.12	0	3	0.55*	0.47	0.92
10. Health suffered	1.43	1.20	0	4	0.66**	0.75	0.91
11. Privacy	2.07	1.33	0	4	0.59**	0.81	0.91
12. Social life suffered	1.61	1.25	0	4	0.70**	0.80	0.91
13. Having friends over	0.75	1.04	0	4	$rs^e = 0.05$	0.45	0.92
14. Spouse expects care	1.64	1.44	0	4	0.52**	0.61	0.91
15. Not enough money	1.54	1.64	0	4	$rs^e = 0.51**$	0.68	0.91
16. Able to take care longer	1.21	1.06	0	3	0.48**	0.56	0.92
17. Lost control of life	0.75	1.00	0	3	$rs^e = 0.49**$	0.43	0.92
18. Leave the care someone else	0.96	0.99	0	3	$rs^e = 0.55**$	0.72	0.91
19. Uncertain what to do	0.96	0.96	0	3	0.13	0.42	0.92
20. Should be doing more	0.82	0.81	0	3	0.28	0.19	0.92
21. Could do better job	0.93	0.97	0	3	$rs^e = 0.61**$	0.58	0.91
22. Overall burden	1.86	1.14	0	4	1.0	0.69	0.91
Zarit total	31.68	15.49	2	67	0.73**		

Notes: [a]Correlation with global item 22, [b]Pearson product-moment correlation coefficient, [c]discriminatory power (correlation with G-ZBI total score), [d]if item deleted, [e]Spearman rank correlation coefficient due to significant Kolmogorov–Smirnov test. $*p < 0.05$, $**p < 0.01$.

Table 3. Correlates of the G-ZBI.

Instrument/variable	G-ZBI r
Level of dependency (BI)	−0.52**
Caregiver depression (CES-D)	0.72**
Carereceiver depression (CES-D)	0.08
Hours spent caregiving per week	0.45*
Cognitive function (MMSE)	−0.43*
Neuropsychiatric symptoms (NPI-Q)	
Severity	0.58**
Distress	0.66**
Life satisfaction (SWLS)	−0.76**

Note: $*p < 0.05$, $**p < 0.01$.

life satisfaction (divergent validity) and depressive mood of the caregiver (convergent validity) and subjective burden. Indeed, the association between life satisfaction and caregiver burden is in accordance with the relation persuasively demonstrated by Onishi et al. (2005) and corresponds to our expectancies. Regarding caregiver depression, past research has revealed a strong relationship between depressive symptoms and subjective burden of spousal caregivers which is supported by our findings. However, the correlation between the CES-D and the G-ZBI in this sample is higher than in past studies reporting correlations between $r = 0.50$ (Arai et al., 1997) and $r = 0.59$ (Hébert et al., 2000). This raises the question whether the burden construct can really be separated from caregiver depression. Despite the fact that several

studies assessed both caregiver burden and depression as negative outcomes of dementia caregiving, little is known about how these constructs relate to each other (Clyburn et al., 2000). Even though previous research indicated definitional and conceptual overlap between spousal caregiver burden and depression, these two constructs are not considered to be identical (e.g., Clyburn et al., 2000; Gallant & Connell, 1997). However, the special kind of association between these constructs is still unclear. For example, a mediation effect was suggested by research showing that depressive symptoms of caregivers are mediated by their subjective burden and stressors associated with caregiving (Clyburn et al, 2000; Pruchno & Resch, 1989). Another study exhibited significantly differing correlates of caregiver burden and depression (Claire, Fitzpatrick, & La Gory, 1995) suggesting that burden basically follows from chronic stressors of the caregiving situation (such as level of activity limitation of the care receiver), while depression results from acute stressors (such as life events). These findings indicate that caregiver burden and depression are two distinct parts of caregiver stress. Another association was reported by Schreiner et al. (2006) indicating good predictive validity of the ZBI to identify family caregivers at risk for depression. Due to these ambiguous research results, there is a need to extend these findings by longitudinal evaluations.

The validity qualities of the G-ZBI are supported by the strong correlations between caregiver burden and severity of neuropsychiatric symptoms of the patient as well as caregiver distress due to these symptoms.

These findings confirm study results demonstrating a negative influence of behavioral problems of the patient on caregiver strain (e.g., Perren et al., 2006; Sink, Covinsky, Barnes, Newcomer, & Yaffe, 2006; Wijngaart, Vernooij-Dassen, & Felling, 2007). Additionally, the correlations between caregiver burden and level of dependency of the patient, dementia severity, and weekly hours spent caregiving (see Table 3) underline not only the negative influence of problematic patients' features on caregiver well-being as past research documented (e.g., Ankri et al., 2005; Arai et al., 2004; Majerovitz, 1995; Wijngaart et al., 2007), but also the good validity of the G-ZBI. The relevance of the association between the amount of caregiving hours per week and caregiver burden has to be verified in studies with a bigger sample due to the fact that correlational relationships depend on populations and research selection criteria. In addition, the usefulness of the 0.05 significance criterion was critically discussed by Cohen (1994) who emphasized that it is set *a priori*. As Carver (1978) stated, it is possible that large differences in the results of small sample studies fail to reach statistical significance, even though these findings exhibit remarkable effects or differences. Consequently, it is plausible to consider substantial correlations, though they lie below the significant threshold and to focus on the practical relevance of relations between variables instead of exclusively referring to statistical significance.

Limitations

The two major limitations of this preliminary evaluation study concern size and composition of the sample indicating limited generalizability. One of the negative consequences of small population sizes is that multivariate analyses providing additional information about the quality of the G-ZBI (e.g., factor analysis) were not adequately accomplishable. Therefore, evaluations with regression or multivariate models have to be tested in future studies with bigger samples. Furthermore, the question of whether these findings possess validity for the converse constellation, males caring for their wives with dementia, cannot be adequately answered. Research documented more negative effects of caregiving and higher burden levels for female than male caregivers (e.g., Thompson et al., 2004). The ability of the G-ZBI to verify possible moderator effects of gender has to be investigated in future studies with a gender-balanced sample.

Since evaluation of test–retest reliability was not included into our analyses, we cannot judge the G-ZBI's consistency over time. This study consists of baseline data of a longitudinal project with three measurement points within a year. Thus, the 6-months-time interval between measurements would indicate the problem of confoundation effects due to the long time gap (such as maturation effects). Furthermore, the test–retest correlation is appropriate only if the burden construct would be known to be stable over the interval between assessments. If the construct being measured fluctuates substantially over time, then this reliability method may significantly underestimate reliability. The assumption that there would be no substantial change in caregiver burden is unlikely since it is no personality trait and changes over time are fully expected (for details about test–retest reliability estimation see Hammond, 1995).

Another limitation refers to possible differences between caregiver subgroups, the homogeneity of this sample respectively. There are hints that spousal caregiving leads to higher subjective burden than caring for another family member (Barnes, Given, & Given, 1992; Pinquart & Sörensen, 2003). Furthermore, there seem to be differences in adaptation processes between caregiver subgroups: Arai, Zarit, Sugiura, and Washio (2002) exhibited that spousal caregivers adapt more effectively to caregiver distress compared to caregiving daughters-in-law. Therefore, the validity of the G-ZBI for not only spousal, but also familial caregivers, as well as its ability to detect development changes must be evaluated in the future.

Like any other self-report measurement, a response-bias might influence the caregiver's answer pattern in the G-ZBI since, for example, none of the patients' neuropsychiatric symptoms have been verified objectively (Robinson, Adkisson, & Weinrich, 2001). Additionally, due to the cross-sectional study design and the small sample size possible moderating and mediating factors influencing the statistical relations could not be sufficiently controlled. Furthermore, due to the sample size, the comparability of German and Swiss older couples afflicted with dementia cannot be validly investigated in this study. Research showed that not only cultural, but also economical factors influence caregiver well-being and burden, respectively (Papastavrou, Kalokerinou, Papacostas, Tsangari, & Sourtzi, 2007), and thus provides a plausible link between international differences concerning health care or pension system and the caregivers' situation. However, due to a recent study, predictors of depression and health of dementia caregivers across different ethnic groups are relatively uniform (Sörensen & Pinquart, 2005) indicating that risk factors of caregiver distress are comparable for different countries.

Finally, the question whether the G-ZBI sufficiently demonstrates sensitivity to change cannot be answered in our study. Recent research emphasized the questionable responsiveness of the ZBI indicating a lack of outcome studies demonstrating ZBI changes following caregiver interventions (Moniz-Cook et al., 2008). Since sensitivity to change offers information about the validity of an instrument as an outcome measure, longitudinal correlational studies or studies evaluating G-ZBI changes after and before psychosocial interventions are needed to develop a better understanding of the instrument's responsiveness.

In sum, the results from this preliminary evaluation indicate good psychometric properties of the G-ZBI. However, future studies focusing on bigger samples

are needed to ascertain reliability and validity of the G-ZBI.

Conclusions

The good psychometric qualities of the G-ZBI lead to the conclusion that it is both a reliable and valid instrument to assess subjective level of spousal caregiver burden in German-speaking countries. As the original version, it may be useful to measure not only subjective level of distress, but also to detect caregivers especially vulnerable to depression and other negative consequences of dementia caregiving as well as caregivers who are in particular need of psychotherapy and support services. Furthermore, the severe level of burden and depressive symptoms of this sample emphasizes not only the relevance of the topic, but also the urgent need to intensify and modify supportive psychotherapeutic or preventive programs for afflicted couples. The evaluation and publication of reliability and validity properties of the G-ZBI is the first step towards improvement of both dementia research as well as caregiver and care receiver supportive therapeutic interventions.

Due to the fact that these findings basically supported well-known correlates of caregiver burden, the study revealed first promising results regarding psychometric qualities of the G-ZBI by providing support for good reliability and validity.

Acknowledgements

References

Alf, C., Bancher, C., Benke, T., Berek, K., Bodner, T., Croy, A. et al. (2006). Konsensusstatement "Demenz" der Österreichischen Alzheimer Gesellschaft – Update 2006 [Consensus statement "dementia" of the Austrian Alzheimer Association – Update 2006]. *Neuropsychiatrie, 20*(4), 221–231.

Ankri, J., Andrieu, S., Beaufils, B., Grand, A., & Henrard, J.C. (2005). Beyond the global score of the Zarit Burden Interview: Useful dimensions for clinicians. *International Journal of Geriatric Psychiatry, 20*, 254–260.

Arai, Y., Kudo, K., Hosokawa, T., Washio, M., Miura, H., & Hisamichi, S. (1997). Reliability and validity of the Japanese version of the Zarit Caregiver Burden Interview. *Psychiatry and Clinical Neurosciences, 51*(5), 281–287.

Arai, Y., Kumamoto, K., Washio, M., Ueda, T., Miura, H., & Kudo, K. (2004). Factors related to feelings of burden among caregivers looking after impaired elderly in Japan under the long-term care insurance system. *Psychiatry and Clinical Neurosciences, 28*, 396–402.

Arai, Y., Zarit, S.H., Sugiura, M., & Washio, M. (2002). Patterns of outcome of caregiving for the impaired elderly: A longitudinal study in rural Japan. *Aging & Mental Health, 6*(1), 39–46.

Bachner, Y.G., & O'Rourke, N. (2007). Reliability generalization of responses by care providers to the Zarit Burden Interview. *Aging & Mental Health, 11*(6), 678–685.

Barnes, C.L., Given, B.A., & Given, C.W. (1992). Caregivers of elderly relatives: Spouses and adult children. *Health and Social Work, 17*(4), 282–289.

Baumgarten, M., Battista, R.N., Infante-Rivard, C., Hanley, J.A., Becker, R., & Gauthier, S. (1992). The psychological and physical health of family members caring for an elderly person with dementia. *Journal of Clinical Epidemiology, 45*(1), 61–70.

Braun, M., Scholz. U., Bailey, B., Perren, S., Hornung, R., & Martin, M. (2009). Dementia caregiving in spousal relationships: A dyadic perspective. *Aging & Mental Health, 13*(3), 426–436.

Carver, R.P. (1978). The case against significance testing. *Harvard Educational Review, 48*(3), 378–399.

Chan, T.S.F., Lam, L.C.W., & Chiu, H.F.K. (2005). Validation of the Chinese version of the Zarit Burden Interview. *Hong Kong Journal of Psychiatry, 15*, 9–13.

Clair, J.M., Fitzpatrick, K.M., & La Gory, M.E. (1995). The impact of psychosocial resources on caregiver burden and depression: Sociological variations on a gerontological theme. *Sociological Perspectives, 38*(2), 195–215.

Clyburn, L.D., Stones, M.J., Hadjistavropoulos, T., & Tuokko, H. (2000). Predicting caregiver burden and depression in Alzheimer's disease. *The Journals of Gerontology: Series B: Psychological Sciences and Social Sciences, 55*(1), S2–S13.

Cohen, J. (1994). The Earth is round. *American Psychologist, 49*(12), 997–1003.

Deutsche Alzheimer Gesellschaft [German Alzheimer Association] (2006). *Die Epidemiologie der Demenz.* Available at: http://www.deutschealzheimer.de/fileadmin/alz/pdf/FactSheet01_01.pdf

Gallant, M.P., & Connell, C.M. (1997). Predictors of decreased self-care among spouse caregivers of older adults with dementing illnesses. *Journal of Aging and Health, 9*, 373–395.

Garand, L., Dew, M.A., Urda, B., Lingler, J.H., DeKosky, S.T., & Reynolds, C.F. (2007). Marital quality in the context of mild cognitive impairment. *Western Journal of Nursing Research, 29*, 976–992.

Grober, E., Hall, C., Lipton, R.B., & Teresi, J.A. (2008). Primary care screen for early dementia. *Journal of the American Geriatrics Society, 56*(2), 206–213.

Hammond, S. (1995). Using Psychometric Tests. In G.M. Breakwell, S. Hammond, & C. Fife-Schaw (Eds.), *Research methods in psychology* (pp. 194–213). London: Sage.

Harkness, J.A., & Schoua-Glusberg, A. (1998). Questionnaires in translation. In J.A. Harkness (Ed.), *ZUMA-Nachrichten Spezial No. 3. Cross-Cultural Survey Equivalence* (pp. 87–126). Mannheim: ZUMA.

Hautzinger, M. (1988). Die CES-D Skala. Ein Depressionsmessinstrument für Untersuchungen in der Allgemeinbevölkerung. *Diagnostica, 38*, 167–173.

Hébert, R., Bravo, G., & Préville, M. (2000). Reliability, validity and reference values of the Zarit Burden Interview for assessing informal caregivers of community-dwelling older persons with dementia. *Canadian Journal on Aging, 19*(4), 494–507.

Kaufer, D.I., Cummings, J.L., Ketchel, P., Smith, V., MacMillan, A., Shelley, T., et al. (2000). Validation of the NPI-Q, a brief clinical form of the Neuropsychiatric Inventory. *The Journal of Neuropsychiatry & Clinical Neuroscience, 12*, 233–239.

Kessler, J., Markowitsch, H.J., & Denzler, P.E. (1990). *Mini-Mental-State: Deutsche Fassung*. Weinheim: Beltz.

Knight, B.G., Fox, L.S., & Chou, C.-P. (2000). Factor structure of the Burden Interview. *Journal of Clinical Geropsychology, 6*(4), 249–258.

Knop, D.S., Bergman-Evans, B., & McCabe, B.W. (1998). In sickness and in health: An exploration of the perceived quality of the marital relationship, coping, and depression in caregivers of spouses with Alzheimer's disease. *Journal of Psychosocial Nursing and Mental Health Services, 36*(1), 16–21.

Mahoney, F., & Barthel, D. (1965). Functional evaluation: The Barthel Index. *Maryland StateMedical Journal, 14*, 61–65.

Majerovitz, S.D. (1995). Role of family adaptability in the psychological adjustment of spouse caregivers to patients with dementia. *Psychology and Aging, 10*(3), 447–457.

Majerovitz, S.D. (2007). Predictors of burden and depression among nursing home family caregivers. *Aging & Mental Health, 11*(3), 323–329.

Maki, N., Ikeda, M., Hokoishi, K., Nebu, A., Komori, K., Hirono, N., et al. (2000). The validity of the MMSE and SMQ as screening tests for dementia in the elderly general population – A study of one rural community in Japan. *Dementia and Geriatric Cognitive Disorders, 11*(4), 193–196.

Moniz-Cook, E., Vernooij-Dassen, M., Woods, R., Verhey, F., Chattat, R., de Vugt, M., et al. for the INTERDEM group (2008). A European consensus on outcome measures for psychosocial intervention research in dementia care. *Aging & Mental Health, 12*(1), 14–25.

Onishi, J., Suzuki, Y., Umegaki, H., Nakamura, A., Endo, H., & Iguchi, A. (2005). Influence of behavioral and psychological symptoms of dementia (BPSD) and environment of care on caregivers' burden. *Archives of Gerontology and Geriatrics, 41*, 159–168.

O'Rourke, N. (2004). Reliability generalization of responses by care providers to the Center for Epidemiologic Studies-Depression Scale. *Educational and Psychological Measurement, 64*, 973–990.

O'Rourke, N., & Tuokko, H.A. (2003). The relative utility of four abridged versions of the Zarit Burden Interview. *Journal of Mental Health and Aging, 9*, 55–64.

Papastavrou, E., Kalokerinou, A., Papacostas, S.S., Tsangari, H., & Sourtzi, P. (2007). Caring for a relative with dementia: Family caregiver burden. *Journal of Advanced Nursing, 58*(5), 446–457.

Perren, S., Schmid, R., & Wettstein, A. (2006). Caregivers' adaptation to change: The impact of increasing impairment of persons suffering from dementia on their caregivers' subjective well-being. *Aging & Mental Health, 10*(5), 539–548.

Pinquart, M., & Soerensen, S. (2003). Associations of stressors and uplifts of caregiving with caregiver burden and depressive mood: A meta-analysis. *Journals of Gerontology: Series B: Psychological Sciences and Social Sciences, 58*(2), 112–128.

Pruchno, R.A., & Resch, N.L. (1989). Aberrant behaviors and Alzheimer's disease: Mental health effects on spouse caregivers. *Journal of Gerontology: Social Sciences, 44*, S177–S182.

Robinson, K.M., Adkisson, P., & Weinrich, S. (2001). Problem behaviour, caregiver reactions, and impact among caregivers of persons with Alzheimer's disease. *Journal of Advanced Nursing, 36*(4), 573–582.

Rozzini, L., Cornali, C., Chilovi, B., Ghianda, D., Padovani, A., & Trabucchi, M. (2006). Predictors of institutionalization in demented patients discharged from a rehabilitation unit. *Journal of the American Medical Directors Association, 7*(6), 345–349.

Schreiner, A.S., Morimoti, T., Arai, Y., & Zarit, S. (2006). Assessing family caregiver's mental health using a statistically derived cut-off score for the Zarit Burden Interview. *Aging & Mental Health, 10*(2), 107–111.

Schulz, R., & Martire, L.M. (2004). Family caregiving of persons with dementia. *American Journal of Geriatric Psychiatry, 12*, 240–249.

Schumacher, J. (2003). SWLS - Satisfaction with Life Scale. Available at: http://www.joerg-schumacher.net/swls_info.pdf

Schweizerische Alzheimervereinigung [Swiss Alzheimer Association] (2007). *98000 Personen mit Demenz leben heute in der Schweiz*. Available at: http://www.alz.ch/d/data/data_179.pdf

Sink, K.M., Covinsky, K.E., Barnes, D.E., Newcomer, R.J., & Yaffe, K. (2006). Caregiver characteristics are associated with neuropsychiatric symptoms of dementia. *Journal of the American Geriatrics Society, 54*(5), 796–803.

Sörensen, S., & Pinquart, M. (2005). Racial and ethnic differences in the relationship of caregiving stressors, resources, and sociodemographic variables to caregiver depression and perceived physical health. *Aging & Mental Health, 9*(5), 459–482.

Thompson, R.L., Lewis, S.L., Murphy, M.R., Hale, J.M., Blackwell, P.H., Acton, G.J., et al. (2004). Are there sex differences in emotional and biological responses in spousal caregivers of patients with Alzheimer's Disease? *Biological Research for Nursing, 5*(4), 319–330.

Vitaliano, P.P., Zhang, J., & Scanlan, J.M. (2003). Is caregiving hazardous to one's physical health? A meta-analysis. *Psychological Bulletin, 129*(6), 946–972.

Werner, O., & Campbell, D. (1970). Translating, working through interpreters and the problem of decentering. In R. Naroll & R. Cohen (Eds.), *Handbook of cultural anthropology*. New York: American Museum of National History.

Wijngaart, M.A., Vernooij-Dassen, M.J., & Felling, A.J. (2007). The influence of stressors, appraisal and personal conditions on the burden of spousal caregivers of persons with dementia. *Aging & Mental Health, 11*(6), 626–636.

Zarit, S.H., Orr, N.K., & Zarit, J.M. (1985). *The hidden victims of Alzheimer's disease: Families under stress*. New York: New York University Press.

Zarit, S.H., Reever, K.E., & Bach, S. (1980). Relatives of the impaired elderly: Correlates of feeling of burden. *The Gerontologist, 20*, 649–655.

Zarit, S.H., & Zarit, J.M. (1987). *Instructions for the burden interview*. Technical Document, University Park, PA, Pennsylvania State University.

Appendix

The Zarit Burden Interview: Original version vs. German version.

ZBI	G-ZBI
1. Do you feel that your relative asks for more help than he/she needs?[a]	1. Glauben Sie, dass Ihr Ehemann um mehr Hilfe bittet als er braucht?[b]
2. Do you feel that because of the time you spend with your relative that you don't have enough time for yourself?[a]	2. Sind Sie der Meinung, dass Sie durch die Zeit, die Sie mit Ihrem Ehemann verbringen, nicht ausreichend Zeit für sich selbst haben?[b]
3. Do you feel stressed between caring for your relative and trying to meet other responsibilities for your family or work?[a]	3. Fühlen Sie sich überfordert bei Ihrem Versuch, neben der Pflege Ihres Mannes, Ihren anderen Verpflichtungen gegenüber Familie oder Beruf nachzukommen?[b]
4. Do you feel embarrassed over your relative's behavior?[a]	4. Bringt Sie das Verhalten Ihres Ehemannes in Verlegenheit?[b]
5. Do you feel angry when you are around your relative?[a]	5. Sind Sie wütend, wenn Sie bei Ihrem Mann sind?[b]
6. Do you feel that your relative currently affects your relationships with other family members or friends in a negative way?[a]	6. Glauben Sie, dass Ihr Mann zur Zeit Ihre Beziehungen mit anderen Familienmitgliedern oder Freunden negativ beeinflusst?[b]
7. Are you afraid what the future holds for your relative?[a]	7. Haben Sie Angst, was die Zukunft für Ihren Mann bringt?[b]
8. Do you feel your relative is dependent on you?[a]	8. Glauben Sie, dass Ihr Mann von Ihnen abhängig ist?[b]
9. Do you feel strained when you are around your relative?[a]	9. Fühlen Sie sich angespannt, wenn Sie bei Ihrem Mann sind?[b]
10. Do you feel your health has suffered because of your involvement with your relative?[a]	10. Glauben Sie, dass Ihre Gesundheit unter Ihrem Engagement in der Pflege Ihres Mannes leidet, bzw. gelitten hat?[b]
11. Do you feel that you don't have as much privacy as you would like because of your relative?[a]	11. Haben Sie das Gefühl, dass Sie wegen Ihres Mannes weniger Privatsphäre oder Raum für sich alleine haben als Sie es gerne hätten?[b]
12. Do you feel that your social life has suffered because you are caring for your relative?[a]	12. Sind Sie der Meinung, dass Ihr Sozialleben unter der Pflege Ihres Mannes leidet, bzw. gelitten hat?[b]
13. Do you feel uncomfortable about having friends over because of your relative?[a]	13. Ist es Ihnen wegen Ihres Mannes unangenehm, Freunde zu Besuch zu haben?[b]
14. Do you feel that your relative seems to expect you to take care of him/her as if you were the only one he/she could depend on?[a]	14. Glauben Sie, dass Ihr Ehemann von Ihnen erwartet, dass Sie ihn pflegen, als wären Sie die einzige Person, von der er abhängen könnte?[b]
15. Do you feel that you don't have enough money to take care of your relative in addition to the rest of your expenses?[a]	15. Sind Sie der Meinung, dass Sie nicht genug Geld für die Pflege Ihres Mannes zusätzlich zu Ihren restlichen Ausgaben haben?[b]
16. Do you feel that you will be unable to take care of your relative much longer?[a]	16. Glauben Sie, dass Sie außerstande sein werden, Ihren Mann viel länger zu pflegen?[b]
17. Do you feel you have lost control of your life since your relative's illness?[a]	17. Glauben Sie, seit der Krankheit Ihres Mannes, die Kontrolle über Ihr eigenes Leben verloren zu haben?[b]
18. Do you wish you could leave the care of your relative to someone else?[a]	18. Wünschen Sie sich, die Pflege Ihres Mannes jemand anderen überlassen zu können?[b]
19. Do you feel uncertain about what to do about your relative?[a]	19. Sind Sie unsicher, was Sie im Fall Ihres Mannes unternehmen sollten?[b]
20. Do you feel you should be doing more for your relative?[a]	20. Glauben Sie, sie sollten mehr für Ihren Mann tun?[b]
21. Do you feel you could do a better job in caring for your relative?[a]	21. Sind Sie der Meinung, dass Sie die Pflege Ihres Mannes besser machen könnten?[b]
22. Overall, how burdened do you feel in caring for your relative?[c]	22. Wie stark fühlen sie sich insgesamt durch die Pflege Ihres Mannes belastet?[d]

Notes: [a]Answering format ZBI: (0) Never (1) Rarely, (2) Sometimes, (3) Quite frequently, (4) Nearly always. [b]Anwering format G-ZBI: (0) Nie, (1) Selten, (2) Manchmal, (3) Häufig, (4) Fast immer. [c]Answering format item 22: (0) Not at all, (1) A little, (2) Moderately, (3) Quite a bit, (4) Extremely. [d]Answering format item 22: (0) Gar Nicht, (1) Ein bisschen, (2) Mässig, (3) Ziemlich belastet, (4) Extrem belastet.