The Burden of Caregiving in Partners of Long-Term Stroke Survivors

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Background and Purpose—Few data are available on the specific caregiving-related problems of stroke patients’ caregivers and factors that influence the burden of these caregivers. The aim of this study was to describe the level and specific nature of the burden of caregiving as experienced by stroke patients’ partners and to estimate the relative contribution of patient and partner characteristics to the presence of partners’ burden.

Methods—As part of a multicenter study on quality of care, burden of caregiving was assessed in 115 partners at 3 years after stroke. Explanatory factors of burden were studied in terms of (1) characteristics of patients (sociodemographic status, severity, type, and localization of stroke, disability, handicap, and unmet care demands) and (2) characteristics of partners (age, sex, disability, quality of life, loneliness, amount of care provided, and unmet care demands).

Results—Partners of stroke patients perceived most caregiving burden in terms of feelings of heavy responsibility, uncertainty about patients’ care needs, constant worries, restraints in social life, and feelings that patients rely on only their care. Multiple regression analysis revealed that a higher level of burden could partly be explained by patients’ disability ($R^2=14\%$), but primarily by partners’ characteristics in terms of emotional distress ($R^2=16\%$), loneliness ($R^2=6\%$), disability ($R^2=3\%$), amount of informal care provided ($R^2=2\%$), unmet demands for psychosocial care ($R^2=4\%$), and unmet demands for assistance in activities of daily living ($R^2=2\%$).

Conclusions—Higher levels of burden are primarily related to partners’ emotional distress and less to the amount of care they provided, or to patients’ characteristics. Sharing responsibilities, helping to clarify the patients’ needs, and getting occasional relief of caregiving may be important in the support of caregivers. (Stroke. 1998;29:1605-1611.)

Key Words: caregivers ■ stress, psychological ■ stroke management

Stroke is one of the most disabling chronic diseases. The majority of patients live in the community, frequently using long-term professional care. Most care, however, is provided by relatives, primarily partners. While these caregivers themselves have to cope with the devastating effects that stroke had on their partner, an increasing amount of demands is made on them. They need, for example, to provide emotional support or assist the patient in activities of daily living. Consequently, caregivers may experience unacceptably high levels of burden, leading to isolation and exhaustion.

Initial gains in rehabilitation are more effectively maintained if the family is healthy, involved, and supportive. Various interventions have been developed to support family members and to improve their involvement in the care process, such as visits by a specialist outreach nurse, long-term counseling, and a stroke family care worker. However, clear evidence of substantial benefit of these interventions is lacking. Several explanations are possible, such as outcome assessment performed too early, use of insensitive outcome measures, or not addressing the most relevant problems. Global measures of psychological health have often been used to study caregivers’ burden. Although a global measure may identify the level of burden, more specific measures are needed to display the most relevant caregiving-related problems to yield guidelines for the development of effective, supportive treatment strategies.

Several studies have investigated the influence of either patient or caregiver characteristics on caregiver burden. The burden of caregiving can only be partly predicted from stroke severity or patient’s dependency in performance of daily activities. Characteristics of caregivers themselves are also important and include physical and psychosocial health problems. Furthermore, partners’ perception of support from professional care services will likely influence the level of their burden of caregiving. To the best of our knowledge, the relative contributions of both patients’ and caregivers’ characteristics to the burden of caregiving have not been described. Although it is expected that caregivers’ burden increases over time, few studies have observed long-term consequences of informal caregiving.
We studied the level and the specific nature of the burden of caregiving in partners of patients 3 years after stroke. Furthermore, we examined the relative contributions of various patient and partner characteristics to the level of burden of partners. Knowledge of these explanatory variables may be useful for identification of caregivers at risk for high levels of burden and may enhance the understanding of how caregivers’ burden can be alleviated best, either by specific care for the patient or by providing support and relief for caregivers.

Subjects and Methods

Study Group
The study group consisted of partners of noninstitutionalized stroke patients. These patients originated from a cohort of 760 consecutively admitted stroke patients who participated in a multicenter quality of care study in 23 hospitals in the Netherlands. Stroke was defined as the sudden onset of focal neurological dysfunction or loss of consciousness lasting more than 24 hours or leading to death presumably due to cerebral vascular disease. Three years after stroke, all survivors were reexamined. The interviews took place from March 1994 through March 1995. Of 371 patients surviving 3 years, 38 (10%) were lost to follow-up and 104 (28%) were institutionalized. Of the remaining 229 noninstitutionalized patients, 173 (76%) lived together with a partner. Fifty-two of these 173 partners (30%) refused to participate for various reasons (no time, too ill, not interested). No differences were found between participating and nonparticipating partners with unpaired t tests for the following patient characteristics: sociodemographic characteristics (age, sex, and level of education), clinical characteristics (severity, type, and localization of stroke), functional health (disability in activities of daily living [ADL]), and disability in instrumental activities of daily living [IADL], and handicap). Of the 121 participating partners, 115 (96%) completed the questionnaire on caregiving burden with <10% missing values.

Procedure of Data Collection
Clinical data on the acute stroke were abstracted from the medical and nursing charts. Three years after stroke, patients were interviewed at home by trained research assistants using a structured questionnaire. If patients were not communicative because of cognitive, speech, or language disorders, patient data were collected in a proxy interview with their partners. Thirteen of the 115 patients (11%) were not communicative. Data on partners themselves were collected by means of a self-report questionnaire. While the research assistant interviewed the patient, partners filled in this self-report questionnaire.

Measures
Data were collected on burden of caregiving and potentially explanatory factors of this burden. Explanatory factors were studied in terms of (1) characteristics of patients: sociodemographic characteristics (age, sex, and level of education), clinical characteristics (severity, type, and localization of stroke), functional health (disability in ADL, disability in IADL, and handicap), and perceived unmet care demands; and (2) characteristics of partners: age, sex, disability in IADL, quality of life, loneliness, amount of informal care provided, and perceived unmet care demands.

Characteristics of Patients
Stroke severity, defined as level of consciousness at stroke onset, was assessed with the Glasgow Coma Scale.18 Because of the possible presence of aphasia, the verbal component of this scale was omitted. When a patient had a maximum score on the eye and motor components, he/she was considered to be alert. Type of stroke ([sub]cortical infarction, lacunar infarction, or hemorrhage) and localization of stroke (left or right hemisphere) were assessed on clinical grounds and CT data. Scans were made routinely within 2 weeks after stroke and were evaluated by local radiologists. Disability in ADL was measured with the Barthel Index,19 and disability in IADL with the Frenchay Activities Index.20 Handicap was assessed with the modified Rankin Scale.21,22 Unmet care demands as perceived by patients (“Do you wish to receive [more] care?”) were assessed for various types of professional care services that are viewed as a potential supplementation or substitution of informal care given by partners. For brevity we aggregated the unmet demands into 3 categories with regard to (1) IADL care (day care, nursing care, and home help); (2) psychosocial care (social care, mental care, sociocultural care [eg, organized social activities with other elderly, group travels]); and (3) aids (including home adaptations).

Characteristics of Partners
In partners, IADL disability was also measured with the Frenchay Activities Index.20 Quality of life was assessed with the COOP Charts, including the following domains: physical function, emotional status, role function, social function, and overall health. Each domain has 5 function levels that are illustrated with pictograms.23,24 Loneliness was measured with the Loneliness Questionnaire developed by de Jong-Gierveld and Kemphuis,25 which consists of 11 items addressing feelings of belonging and aspects of missing relationships. The amount of care provided by partners was assessed with a self-constructed scale. For 10 daily activities (personal care, eating or drinking, mobility inside or outside the house, preparing meals, household management, recreation, coping with emotional problems, arranging home admission, aids or care, and management of finances, insurance, or housing) partners were asked to indicate the amount of care they provided on a 3-point rating scale: never or seldom, sometimes, often or always. The amount of informal care provided was determined by summation of the item scores, and ranged from 0 (no informal care) to 30 (a large amount of informal care). The reliability of this scale showed to be sufficient (Cronbach’s α coefficient = 0.72). Unmet care demands as perceived by partners (“Would you benefit from professional care services [or aids] taking over some care tasks you have to perform?”) were, as with patients’ unmet care demands, assessed for each of the aforementioned types of professional care and in the analyses aggregated into 3 categories: unmet demands for (I)ADL care, psychosocial support, and aids.

Burden of Caregiving
The level and the specific nature of the burden of caregiving as experienced by partners of stroke patients were assessed with the Sense of Competence Questionnaire (SCQ).26,27 The SCQ is arranged into 3 subscales: (1) satisfaction with the impaired person as a recipient of care (7 items); (2) satisfaction with one’s own performance as a caregiver (12 items); and (3) consequences of involvement in care for the personal life of the caregiver (8 items). Each item was scored on a 4-point rating scale. The burden score was determined by summation of the item scores; the total score ranges from 27 (no burden) to 108 (severe burden). The psychometric properties of the SCQ in terms of homogeneity, stability, construct validity, and clinical validity were good on total level as well as the subscale level among caregivers of dementia and stroke patients.26,27

Statistical Analyses
The level and the specific nature of burden are described by the total mean and the subscale means of the SCQ. Since the SCQ contains 3 subscales with various numbers of items, standardized means were calculated for comparison of the subscale scores (standardized mean equals mean subscale score/number of subscale items). Differences between the subscale means were tested with dependent-samples t tests. Explanatory factors of burden were identified at a univariate level with independent-samples t tests and ANOVA. The significant characteristics of patients and partners (P ≤0.10) as identified from the univariate analyses were also analyzed with multiple linear regression (with a stepwise forward selection strategy, using the F statistic, with P = 0.05 as the criterion for selection). Residual analyses were performed to search for violations of necessary assumptions in terms of linearity, equality of variance, normality,
and influential points (Cook’s distances). The possible presence of collinear data was explored with Tolerance Statistics. All analyses were done with SPSS/PC+ Statistics, version 7.5 (SPSS Inc). The study was approved by the Medical Ethics Committees of the participating centers. Informed consent was given by all patients and partners.

Results

Characteristics of Patients

Characteristics of patients and their relationship to partners’ burden are presented in Table 2. Median age of the patients was 68 years (range, 29 to 90 years), most patients were male (77%), and 63 patients (55%) had only primary education. There were 92 supratentorial strokes (52 subcortical and cortical infarctions, 26 intracerebral hemorrhages, and 14 lacunar infarctions) and 17 infratentorial strokes. In 6 (5%) patients stroke type was unknown or incompletely described. As concerned lesion location, 54 had left-hemisphere and 43 had right-hemisphere lesions. In 18 (16%) patients lesion laterality was undetermined (unknown for 1 patient and infratentorial in 17 patients). Altogether, 44 (38%) patients were disabled in ADL, whereas almost half of the patients (48%) were substantially handicapped in terms of care dependency. Univariate analysis did not show a relationship between patients’ sociodemographic characteristics and partners’ burden of caregiving. Concerning the clinical characteristics, only lesion location was related to partners’ burden: partners of patients with a right-hemisphere lesion perceived a higher level of burden ($P=0.06$). Patients’ functional health problems in terms of disability in ADL ($P<0.01$), disability in IADL ($P=0.08$), and handicap ($P=0.02$) also appeared to be associated with a higher burden among partners. Concerning patients’ unmet care demands, only unmet demands for aids showed to be related to higher levels caregiving burden ($P=0.06$).

Characteristics of Partners

Table 3 shows that the median age of partners was 65 years (range, 28 to 87 years), most partners were female (77%). Univariate analysis revealed a significant association between all partner characteristics and the level of perceived burden, with the exception of partners’ age, sex, and physical functioning as measured with the COOP charts.

The results of the multiple linear regression analysis to explain burden of caregiving are presented in Table 4. The variance of the total burden explained was 47%. Although patients’ characteristics in terms of disability in IADL independently explained 14% of the total variance in burden, partners’ characteristics in terms of disability in IADL (3%), emotional distress (16%), loneliness (6%), and a large amount of informal care provided (2%) were able to explain independently the greater part of the burden level. Not patients’ unmet care demands, but partners’ unmet demands for IADL care (2%) and psychosocial support (4%) appeared to be associated with higher levels of burden of caregiving. On subscale level, the variance of subscale 3 “consequences of involvement in care for the personal life of the caregiver” had the highest degree of explained variance (63%), especially by the amount of care partners provided (29%). Dissatisfaction with the patient (subscale 1) was primarily explained by partners’ unmet care demands for psychosocial care (24%), whereas emotional distress was an important explanatory factor (16%) of dissatisfaction with one’s own performance as a caregiver (subscale 2).

Discussion

Partners of stroke patients perceived most caregiving burden in terms of “the consequences of involvement in care for the personal life of the caregiver” (subscale 3 of the SCQ), and more specifically in terms of feelings of heavy responsibility, uncertainty about patient’s care needs, constant worries, restraint in social life, and feelings that patients rely on only their care. Although patients’ impaired functional health was associated with the burden of caregiving, partners’ character-

| TABLE 1. Descriptive Statistics of Level and Nature of Burden of Caregiving 3 Years After Stroke |
|-----------------------------------------------|-----------------------------------------------|
| Burden of Caregiving, SCQ<sup>26–28</sup> | Mean (Standardized Mean)<sup>*</sup> | SD |
| Dissatisfaction with patient (subscale 1; 7 items) | 10.7 (1.5) | 4.5 |
| Dissatisfaction with own performance (subscale 2; 12 items) | 19.4 (1.6) | 5.4 |
| Consequences for personal life (subscale 3; 8 items) | 17.0 (2.1) | 6.3 |
| Total level of burden | 47.1 (1.7) | 12.7 |

n=115 partners.  
*Standardized mean = mean subscale score/number of subscale items.
istics seem to have a greater impact on this burden. A large amount of care provided, partners’ unmet demands for psychosocial care, and their emotional distress were related especially to higher levels of burden.

Some caution is needed in interpreting the results. First, generalization of our findings may be affected by the selection of patients who had been hospitalized. In the Netherlands approximately 70% of all stroke patients are admitted to the hospital. Since hospitalized patients have shown to be patients with more severe strokes, a community-based study might have revealed lower levels of caregiving burden. Second, generalization may be affected by selection bias caused by nonresponse (52 partners, 30%). We did not observe this type of selection bias on the basis of patients’ characteristics. As we do not have data on nonparticipating partners, however, selection bias cannot be completely ruled out, particularly considering the fact that some partners declined to participate because they felt too ill. Third, it should be noted that our study group consisted of partners who have been able to continue caregiving for 3 years after stroke. The need to relieve the family of caregiver responsibility has been found to be a reason for institutionalization of stroke patients. Earlier data collection, ie, after discharge, might have revealed higher levels or other types of burden. More research is needed on the dynamic aspects of caregiving. Fourth, although the psychometric properties of the SCQ have been found to be good, further research is needed to evaluate its subscales as independent measures. Last, since no reference data of the open population on caregiving burden are available, it is difficult to interpret the specific impact of a stroke on the burden of caregiving thereafter. Comparison with results of studies in other patient groups may help to clarify specific disease-related caregiving burden.
Studies among caregivers of dementia patients showed a largely comparable level and type of burden. Differences in type of burden are, however, greater uncertainty about the patients’ care needs among partners of stroke patients and more relational and interaction problems among caregivers of dementia patients. We observed an association between patients’ disability in IADL and caregivers’ burden. This association was also found in other stroke studies, but was less clear in dementia. These findings confirm the expectation that compared with dementia, physical health problems in stroke are more often present and severe, and therefore have greater influence on caregivers’ burden. Multivariate analysis did not reveal a relationship between patients’ handicap and caregivers’ burden. Studies including more specific measures of psychosocial health, however, did reveal a relationship between stroke patients’ psychosocial health and caregivers’ burden. To identify the impact of patients characteristics on caregiving burden, future research needs to include both physical and more specific psychosocial measures. Partners’ disability in IADL also appeared to be related

<table>
<thead>
<tr>
<th>Partner Characteristics</th>
<th>Differentiation</th>
<th>Definition</th>
<th>No. (%) of Partners</th>
<th>Partners’ Burden†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Younger</td>
<td>≤65‡</td>
<td>57 (50)</td>
<td>47.3</td>
</tr>
<tr>
<td></td>
<td>Older</td>
<td>&gt;65</td>
<td>58 (50)</td>
<td>46.8</td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
<td></td>
<td>27 (23)</td>
<td>44.6</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td></td>
<td>88 (77)</td>
<td>47.8</td>
</tr>
<tr>
<td>Disability in IADL</td>
<td>Lower</td>
<td>≤43 FAI‡</td>
<td>58 (50)</td>
<td>44.7</td>
</tr>
<tr>
<td></td>
<td>Higher</td>
<td>&gt;43 FAI</td>
<td>57 (50)</td>
<td>49.4*</td>
</tr>
<tr>
<td>Quality of life</td>
<td>COOP Charts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical function</td>
<td>(Very) good</td>
<td></td>
<td>25 (22)</td>
<td>46.5</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td></td>
<td>48 (42)</td>
<td>47.2</td>
</tr>
<tr>
<td></td>
<td>(Very) poor</td>
<td></td>
<td>42 (36)</td>
<td>47.8</td>
</tr>
<tr>
<td>Emotional status</td>
<td>(Very) good</td>
<td></td>
<td>66 (57)</td>
<td>41.6</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td></td>
<td>34 (70)</td>
<td>53.8</td>
</tr>
<tr>
<td></td>
<td>(Very) poor</td>
<td></td>
<td>15 (13)</td>
<td>55.5***</td>
</tr>
<tr>
<td>Role function</td>
<td>(Very) good</td>
<td></td>
<td>83 (72)</td>
<td>45.1</td>
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<tr>
<td></td>
<td>Moderate</td>
<td></td>
<td>24 (21)</td>
<td>49.9</td>
</tr>
<tr>
<td></td>
<td>(Very) poor</td>
<td></td>
<td>8 (7)</td>
<td>58.1***</td>
</tr>
<tr>
<td>Social function</td>
<td>(Very) good</td>
<td></td>
<td>92 (80)</td>
<td>45.0</td>
</tr>
<tr>
<td></td>
<td>Moderate</td>
<td></td>
<td>15 (13)</td>
<td>50.0</td>
</tr>
<tr>
<td></td>
<td>(Very) poor</td>
<td></td>
<td>8 (7)</td>
<td>65.3***</td>
</tr>
<tr>
<td>Overall health</td>
<td>(Very) good</td>
<td></td>
<td>35 (30)</td>
<td>41.7</td>
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<tr>
<td></td>
<td>Moderate</td>
<td></td>
<td>51 (44)</td>
<td>45.8</td>
</tr>
<tr>
<td></td>
<td>(Very) poor</td>
<td></td>
<td>29 (25)</td>
<td>55.7***</td>
</tr>
<tr>
<td>Loneliness</td>
<td>Less</td>
<td>≤39 LQ‡</td>
<td>59 (51)</td>
<td>41.3</td>
</tr>
<tr>
<td></td>
<td>More</td>
<td>&gt;39 LQ</td>
<td>56 (49)</td>
<td>53.1***</td>
</tr>
<tr>
<td>Amount of informal care provided</td>
<td>Lower</td>
<td>≤16‡</td>
<td>56 (49)</td>
<td>42.7</td>
</tr>
<tr>
<td></td>
<td>Higher</td>
<td>&gt;16</td>
<td>59 (51)</td>
<td>51.2***</td>
</tr>
<tr>
<td>Unmet demand for</td>
<td>(I)ADL care</td>
<td>No</td>
<td>80 (70)</td>
<td>42.4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Yes</td>
<td>35 (30)</td>
<td>53.1***</td>
</tr>
<tr>
<td>Psychosocial support</td>
<td>No</td>
<td>88 (76)</td>
<td>43.4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>27 (24)</td>
<td>58.3***</td>
<td></td>
</tr>
<tr>
<td>Aids</td>
<td>No</td>
<td>93 (81)</td>
<td>45.6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Yes</td>
<td>22 (19)</td>
<td>53.2**</td>
<td></td>
</tr>
</tbody>
</table>

FAI indicates Frenchay Activities Index; LQ, Loneliness Questionnaire. n=115 partners.

*Independent-samples t test (because of equal variances, differences in mean scores were analyzed with "pooled-variance t test") and ANOVA. Significantly different burden scores: *P<0.10, **P<0.05, ***P<0.01.
†Mean total score on the Sense of Competence Questionnaire.
‡Dichotomized according to median.
Each quality of life domain was measured with a 5-point scale: very good, good, moderate, poor, or very poor. In the analysis, very good and good, and also very poor and poor, were aggregated.
to burden of caregiving. However, studies among caregivers of dementia patients did not demonstrate a relationship between caregivers’ physical problems and the burden of caregiving they perceived.\textsuperscript{27,32} When the differences in health problems of dementia patients (ie, behavioral problems) and stroke patients (ie, physical disability) are considered, caregivers’ physical health problems may become important when patients need assistance in the basic activities of daily living, such as getting out of bed.

It has been assumed that partners who provide more care (objective burden) will experience a higher amount of burden (subjective burden).\textsuperscript{33,34} Although “the consequences of involvement in care for the personal life of the caregiver” (subscale 3) was primarily explained by the actual amount of care provided, we could only demonstrate a minor association between the actual amount of care provided and the total level of perceived caregiving burden. Caregivers’ emotional status showed to be more important in explaining perceived burden. Moreover, research by others has shown that caregivers not only experience burden, but also may experience gain as a result of caregiving, including pride, gratification, and feeling closer to their partners.\textsuperscript{35}

Our findings may have several implications for the practice of care for stroke patients and partners. They may help to identify partners who are at greatest risk of high levels of burden. As expected, our results demonstrate that partners of severely disabled patients perceive high levels of burden, but even more important risk factors of burden are functional health problems, especially psychosocial problems, in partners themselves. Furthermore, our findings showed that caregiving burden in partners of stroke patients was particularly perceived in terms of feelings of heavy responsibility, uncertainty about patients’ care needs, constant worries, restraints in social life, and feelings that patients rely on only their care. We also found this specific type of burden at 6 months after stroke.\textsuperscript{28} Sharing responsibilities, helping to clarify the patients’ needs, getting occasional relief of caregiving, and paying attention to the partners’ feelings may be important in the support of caregivers. Partners themselves indicated specifically the need for more psychosocial support, especially if they feel dissatisfied about the patients’ behavior.

This study indicates that while the contribution made by relatives of stroke patients to their care is substantial, this does not happen without consequences for their own health and interference with their overall lives. It is important that professional caregivers involved in the ongoing care of stroke survivors and their families, be aware of the increasing demands made on caregivers and the specific problems they perceive in caregiving. Appropriate advice and support may preserve informal caregiving, which eventually enables patients to live for a longer period in the community.

\begin{table}
\centering
\caption{Forward Stepwise Regression Models to Explain Burden of Caregiving at 3 Years After Stroke (n=115 Patients and Partners)*†, Partial Explained Variance (Partial $R^2$‡), and Total Explained Variance (Total $R^2$)}
\begin{tabular}{|l|c|c|c|c|}
\hline
Explanatory Factors & Dissatisfaction with Patient & Dissatisfaction with Own Performance & Consequences for Personal Life & Total Burden of Caregiving \\
\hline
Patient characteristics & & & & \\
\quad Disability in IADL & & & 14% & 14% \\
Partner characteristics & & & & \\
\quad Female & 2% & & & \\
\quad Disability in IADL & & & 5% & 3% \\
Quality of life & & & & \\
\quad Emotional distress & 4% & 16% & 4% & 16% \\
\quad Impaired role function & 4% & 4% & & \\
\quad Impaired social function & 4% & & & \\
Loneliness & & 3% & 11% & 6% \\
\quad Amount of informal care provided & & & 29% & 2% \\
\quad Unmet demand for (I)ADL care & 5% & 4% & 2% & \\
\quad Unmet demand for psychosocial care & 24% & & 4% & \\
\hline
Total $R^2$‡ & 43% & 27% & 63% & 47% \\
\hline
\end{tabular}
\end{table}

Values other than Total $R^2$ are partial $R^2$. n=115 patient and partner sets.
*All univariate significant explanatory factors ($P<0.10$) were entered into the multivariate model. The table only presents the statistically significant results.
†Multiple regression with a stepwise forward selection strategy, using the F statistic with $P=0.05$ as the criterion for selection. For all 4 models, analysis of residuals did not show violations of necessary assumptions in multiple linear regression in terms of linearity, equality of variance, or normality. No significant outliers could be located (mean Cook’s distance = 0.007; range = 0.000 – 0.049), nor did measures of collinearity reveal a high correlation between the independent variables (range of tolerance = 0.73–0.96).
‡Total $R^2$ is the percentage of total variation of the dependent variable score (caregiver burden) that is explained by the independent variables together. Partial $R^2$ is the percentage variance in the dependent variable score that is explained by the single independent variable adjusted.
Acknowledgments

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