



A high sense of coherence protects from the burden of caregiving in older spousal caregivers

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ABSTRACT

Objectives: Caregiving is often associated with burden and chronic stress. Sense of coherence (SOC) may help the caregivers in coping with their stress and was identified as a positive factor for health outcomes and quality of life. We aimed to study the links between SOC, burden, depression and positive affects among caregivers of frail older patients.

Methods: Seventy-nine spousal caregivers were recruited via the geriatric outpatient clinic. Data collected: Zarit Burden Inventory, SOC-13, Geriatric Depression Scale, Caregiver Reaction Assessment (CRA), sleep, time of supervision, Katz Index, Global Deterioration Scale and Neuropsychiatric Inventory. Analyses: Caregiver's characteristics were analyzed by burden severity and SOC level. Multivariable logistic regressions were used in order to identify the variable that best predict caregiver burden and high SOC.

Results: The mean age was 79.4 ± 5.3 ; 53% were women. Among care-recipient, 82% had cognitive impairment and the median Katz Index was 3. Caregivers with a high SOC and an older age reported a lower burden (Odds Ratio (OR) 0.18, 95% confidence interval (CI) 0.04–0.65 and OR 0.87, 95% CI 0.76–0.98, respectively). A higher burden was associated with patient functional limitations (OR 8.69, 95% CI 2.28–40.46).

Discussion: Having a high sense of coherence seems to be a protective factor against the burden. To support caregivers, health providers should recognize the expertise of the caregivers and the meaningfulness of this care situation.

1. Introduction

Caring for frail older persons at home represent a high risk of burden for their caregiver, particularly in case of dementia (Schoenmakers, Buntinx, & Delepeleire, 2010).

Zarit defines the burden as all physical, psychological, emotional, social and financial consequences experienced by the caregiver (Zarit, Todd, & Zarit, 1986). Many scales assessing the burden of care have been proposed (Mosquera et al., 2016; Van Durme et al., 2012). Despite the large number of studies identifying factors associated with the caregiver burden, few were interested in the personality of the caregiver. Most have focused on patient characteristics (activities of daily living abilities, cognition, and behavioral disturbances) and caregiving characteristics (Bergvall et al., 2011; Germain et al., 2009).

Moreover, the majority of them assess caregiving as a stressful experience. This narrow vision could be extended by adding potential

resources for the caregivers, such as the sense of coherence, and promoting the positive effects of the caregiving situations, such as self-esteem.

The concept of sense of coherence (SOC) was proposed by A. Antonovsky (Antonovsky, 1987) to explain why some people remain healthy in spite of stressful life situations. His salutogenic theory focused on factors that support human health and well-being rather than on factors that cause disease. He defines SOC as a permanent, but dynamic and reliable feeling. SOC consists of understanding life events (Sense of Comprehensibility), the ability to manage them (Sense of Manageability) and feeling that they have meaning (Sense of Meaningfulness). SOC has been shown to be reliable, valid and cross-culturally applicable (Eriksson & Lindstrom, 2005). The hypothesis of Antonovsky was that with a stronger feeling of coherence, there is a higher probability of remaining healthy. A high SOC allows people to react with flexibility and to activate corresponding resources. Indeed, a high

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SOC has been shown to be a predictor of quality of life (Eriksson & Lindstrom, 2007) as well as a protective factor against mortality (Poppius, Tenkanen, Hakama, Kalimo, & Pitkanen, 2003; Surtees, Wainwright, Luben, Khaw, & Day, 2003) and functional decline, even in a population with a high vulnerability to adverse outcomes (Boeckxstaens et al., 2016). SOC is best described as a continuous process as opposed to a stable personality characteristic (Eriksson & Lindstrom, 2005). It has been suggested that SOC may develop during lifespan and is increasing with age (Nilsson, Leppert, Simonsson, & Starrin, 2010). SOC was generally also higher in men than in women (Nilsson et al., 2010) and inversely associated with depressive symptom (Dezutter, Wiesmann, Apers, & Luyckx, 2013).

There is few literature existing on caregivers' SOC. Some studies have indicated that a higher SOC is associated with a lower burden (Andren & Elmstahl, 2008) and lower distress (Valimäki, Vehviläinen-Julkunen, Pietilä, & Pirttilä, 2009). So, a caregivers' high SOC might be an individual resource that successfully helps to cope with caregiving. However, caregiver's depression seems also associated with a low sense of coherence and quality of life (Orgeta & Sterzo, 2013; Valimäki et al., 2009).

On the other hand, in 2014, a survey of the National Research Center (USA) found that 83% of caregivers viewed caregiving as a positive experience. This positive affect could potentially protect caregivers against some of the stress-related health outcomes. The Caregiver Reaction Assessment (CRA) (Pascal Antoine & Christophe, 2007) estimates the various aspects of the caregiving situation by considering positive and negative dimensions of the caregiver's reactions.

In this context, we evaluated the associations between SOC, positive affects, depression and the burden experienced by older caregivers.

2. Design and methods

This was a cross sectional analysis of data from a cohort study of older spousal caregivers focusing on caregivers' health.

2.1. Participants (caregivers)

Caregivers were recruited from March 2015 until May 2016 via the geriatric outpatient's clinic and memory center at the University Hospital in Namur, and with the help of general practitioners and home nurses. The inclusion criteria were more than 70 years of age and living at home with a spouse with either a cognitive deficit (score more than 3/7 on the global deterioration scale (Reisberg B, 1982 Reisberg, de Leon & Crook, 1982)) or functional decline (a minimum dependence of 1 activity of daily living). Caregivers were met at their home in the morning. All provided written informed consent that was approved by the CHU UCL Namur Institutional Review Board (NUB: BO39201422799).

2.2. Socio-demographic data of caregivers

We collected data on the caregiver demographic characteristics, including age, sex, educational level and income level. Socioeconomic status was constructed as suggested by Cockerham (Cockerham, 2007). A total score for the socioeconomic status was calculated as the sum of education (primary school = 1; unfinished secondary education = 2; secondary education = 3; higher education = 4), income (difficult = 1; easy = 2) and past occupation (worker-farmer-unemployed = 1; craftsman-self-employed = 2; employee-officer = 3; manager-liberal profession = 5).

2.3. Medical data of caregivers

The presence of comorbidities was evaluated with the Charlson Comorbidity Index (Charlson, Pompei, Ales, & MacKenzie, 1987). The short physical performance battery (Guralnik et al., 1994) was used to

assess the lower extremity function. It includes balance (ability to stand in tandem positions), gait speed (time to walk 4 m) and strength (time to rise from a chair and return to the seated position 5 times). Nutrition was assessed with the Mini Nutritional Assessment-short form (Kaiser et al., 2009), frailty phenotype was assessed with the definition of L. Fried (Fried et al., 2001) and cognitive status was assessed with the clock drawing test.

2.4. Psychosocial data of caregivers

Caregivers were asked to complete a set of four self-report questionnaires when we visited them at home. The CRA consists of 24 items in five subscales: self-esteem, lack of family support, financial problems, disrupted schedule and health problems. Responses are represented on a Likert-type scale and response options range from 1 = strongly disagree to 5 = strongly agree. A higher score on the caregiver's self-esteem subscale indicates a more positive reaction to caregiving, while higher scores on the other four subscales indicate greater negative effects.

Caregiver burden was measured using the Zarit Burden Interview (ZBI) (Zarit et al., 1986), which consists of 22 self-report items. Each item is scored on a 5-point, Likert-type scale ranging from 'never' to 'nearly always present'. Total scores range from 0 to 88 with higher scores indicating a higher perceived burden.

The Sense of Coherence Scale (SOC-13), a 7-point Likert-type scale, was used to estimate the caregiver's SOC. A systematic review of the validity and reliability of the shorter SOC-13 scale (Eriksson & Lindstrom, 2005) showed that it is generally acceptable among older people. SOC seems to be a health promoting resource, which strengthens the resilience and develops a positive subjective state of health. We determined the quartiles of the total score and divided the participants into a high-SOC group (highest quartile) and a medium-low SOC group.

We finally assessed depressive symptoms with the Geriatric Depression Scale-15 (GDS) (Leshner & Berryhill, 1994).

We also collected the following information on the caregiving situation: the time spent giving care or supervision and the duration as caregivers. Finally, we asked them about the quality of their sleep (sleep duration, more or less than 8 h and perturbation of sleep, yes/no) and the gratitude of their spouse ("Do you feel that your caring efforts are appreciated by your spouse?")

2.5. Medical data of care-recipient

Concerning the care-recipient, the presence of functional impairment was evaluated with the Katz Index (Katz, 1983) on a 6-point scale with lower scores indicating greater dependence. People with dementia were screened for behavioral disturbances with the Neuropsychiatric Index (Cummings et al., 1994; Kaufer et al., 2000) and the severity of dementia was rated with the Global Deterioration Scale (Reisberg B, 1982). All data for the care-recipient were completed by their caregivers. The history of the dependency and the evolution of the cognitive function were also evaluated as far as possible.

2.6. Statistical analyses

Continuous variables were summarized using means and standard deviation (SD) or median with the association P_{25} and P_{75} , depending on the normality of the distribution. Categorical variables were summarized using the frequencies and percentages. The burden was dichotomized into "low burden" (< 25/88 points) and "high burden" (> 24/88). This cut-off score has significant predictive validity for identifying caregivers who have a risk of depression (Schreiner, Morimoto, Arai, & Zarit, 2006). Variables were compared between the group of caregivers with low or high burden using a Student's *t*-test or Chi-square test, as appropriate. Correlations between the

psychological scales among caregivers were examined to check for correlations between variables. Pearson's correlation was computed between two continuous variables, polychoric correlation was computed between two ordinal variables, and polyserial correlation was computed between a continuous and an ordinal variable. Stepwise logistic regression was performed to identify the patient and caregiver characteristics that best predict the caregiver burden. First, univariate analyses were performed with all potentially relevant variables. Variables with a p -value < 0.20 in univariate analyses were candidates for the multivariable model. Independent variables considered for selection into the model for the burden were the caregiver age, gender, socioeconomic status, SOC, self-esteem (CRA), depression and sleep, as well as the patient gratitude, ADL abilities, behavioral disturbances and time taken for supervision. A stepwise selection was then applied to select the final multivariable model. In addition, the presence of multicollinearity was checked through the use of variance inflation factor (VIF). The results are presented as odd ratios (OR) and 95% confidence intervals (CI). The goodness of fit of the model was assessed using the c -statistic and the associated 95% CI. Data were analyzed using the SPSS statistical software package (version 24; SPSS Inc., Chicago, IL, USA) and R statistical software Version 3.3.1. (Free Software Foundation, Inc., Boston, Massachusetts, USA). All testing was two-tailed with a significance level set at $p < 0.05$.

3. Results

3.1. Caregivers' characteristics

A total of seventy-nine, community-dwelling spousal caregivers of old patients were recruited. The mean age was 79.4 years and 53.2% of the participants were women ($n = 42/79$). Approximately one third of spousal caregivers were at risk of depression ($GDS > 5/15$; $n = 24/79$; 30.4%). Despite the depression risk, the caregivers' self-esteem subscale scores of the CRA scale were high (score $> 3/5$) among 69.6% of caregivers (median [P25–P75]: 4[3–4]). This dimension considers the desire and pleasure associated with caregiving. Disruption of their schedule was a more important negative aspect (median [P25–P75]: 4[3–4]) than lack of family support (median [P25–P75]: 3[2–3]), financial problems (median [P25–P75]: 2[2–3]) or health problems (median [P25–P75]: 3[2–3]).

3.2. Care-recipient profiles

The characteristics of the care-recipients are given in Table 1. The 79 care-recipients were eighty-two years old on average. While dementia was not an inclusion criteria, 82% of the care-recipient had cognitive impairment and 68% had cognitive impairment with behavioral disorders. Their median cognitive disorders were moderate with a score of 4 on 7 in the GDS scale (4 [3–5]) and their functional status were

various with a median of 3 points on 6 on the ADL scale of Katz [2–6]. Care-recipients with Alzheimer's disease accounted for 57% of those presenting cognitive disorders.

The non-cognitive impaired care-recipients were more functionally dependent with a median Katz index of 1.5 on 6 [1–2.5]. Their physical dependence was mostly the result of orthopedic disorders ($n = 9$) or strokes ($n = 4$).

The care-recipients benefited from the care of their spouse since a median of 3 years (3 [2–5]).

3.3. Caregiver burden

The mean caregiver burden score was at 32 points out of 88. It represents a "mild to moderate burden" according to Zarit. The burden was significantly correlated with all the CRA subscales and with the SOC-13 (Table 2). A high burden was related to younger caregivers, lower sense of coherence, depression, perturbed sleep, behavioral disturbances and higher ADL dependence of the care-recipient as well as more time dedicated to caregiving (Table 3). The multivariable logistic regression showed a higher burden among caregivers of patients who had more ADL dependence with a KATZ score ≥ 8 (OR 4.90, 95% CI 1.76–14.59) (Table 4). An older caregiver age (OR 0.87, 95% CI 0.76–0.98) and a high SOC-13 (OR 0.18, 95% CI 0.04–0.65) were associated with a lower caregiver burden (Table 4, C -statistic 0.831, 95% CI 0.734–0.928).

3.4. Caregiver sense of coherence

SOC-13 was normally distributed with a mean \pm SD of 64.8 ± 10.3 out of 91 points. The Cronbach's alpha was 0.76. SOC-13 was negatively correlated with depression (Table 2, Pearson's $R = -0.47$). Caregivers with a higher SOC (highest quartile) were older, less depressed and had less perturbed sleep with higher self-esteem (Table 5). No difference was found in terms of the socio-economic status, gender and clinical measures, such as the comorbidities, cognition, physical performance, frailty and malnutrition. None of these variables were statistically significant in the multivariable analysis (Table 6).

4. Discussion and implications

As observed in the study of P. Antoine (Pascal Antoine & Christophe, 2007), the most important correlations between the different sub-scales of the CRA and the burden were the disruption of their schedule and the impact on health ($r = 0.556$ and $r = 0.598$). The three other subscales (self-esteem, lack of family support and financial problems) had lower correlations reflecting other constructs. Sixty-nine percent of the caregivers consider caregiving as a source of self-fulfillment. This observation adds another positive dimension to caregiving that is linked to the meaningfulness of this care situation.

The mean burden of our population was mild to moderate (mean of 32 out of 88). This is consistent with the results of other studies reporting that spousal caregivers may experience a lower level of burden than adult-child caregivers (Conde-Sala, Garre-Olmo, Turro-Garriga, Vilalta-Franch, & Lopez-Pousa, 2010; Molyneux, McCarthy, McEniff, Cryan, & Conroy, 2008). This difference could be related to the nature of the relationship; caring for one's spouse may be considered part of the marital duties and less of a disruption of one's schedule when there are no other professional or family obligations.

In our study, a higher burden was particularly associated with the activities of daily living dependence of the care-recipient. Patient functional limitations have often been identified as a predictor of caregiver burden (Germain et al., 2009; Haro et al., 2014; Kim et al., 2012). We found no difference in the burden according to the socio-economic status of the caregivers or caregiver gender. Nevertheless several studies found that men experienced fewer burdens than women

Table 1
Care-recipients characteristics.

| Characteristics | Care-recipients |
|--|-----------------|
| Age, years, mean \pm SD ($N = 79$) | 81.6 \pm 5.3 |
| Gender: female, n (%) ($N = 79$) | 37 (46.8) |
| GDS, median [P25–P75] ($N = 65$) | 4 [3–5] |
| NPI, median [P25–P75] ($N = 65$) | 10 [2–21] |
| Katz among cognitive impaired care-recipients, median [P25–P75] ($N = 65$) | 3 [2–6] |
| Katz among non-cognitive impaired care-recipients, median [P25–P75] ($N = 14$) | 1.5 [1–2.5] |

Notes. GDS-15: Geriatric Depression Scale-15; SOC-13: Sense of Coherence scale, Zarit: burden scale, CRA: Caregiver Reaction Assessment, GDS: Global Deterioration Scale, NPI: Neuropsychiatric Inventory; KATZ: activities of daily living scale with lower scores indicating greater dependence.

Table 2
Correlation table between the psychological scales among caregivers.

| Psychological scales (N = 79) | Self-esteem | family | Financial | Schedule | Health | Zarit | GDS-15 | SOC-13 |
|-------------------------------|-------------|--------|---------------------|--------------------|---------------------|----------------------|--------|----------------------|
| SE | 1 | −0.192 | −0.272 [*] | −0.026 | 0.221 | −0.335 ^{**} | −0.172 | 0.110 |
| Family | | 1 | 0.424 ^{**} | 0.246 [*] | 0.025 | 0.314 ^{**} | 0.197 | −0.180 |
| Financial | | | 1 | 0.248 [*] | 0.407 ^{**} | 0.267 [*] | 0.129 | −0.291 ^{**} |
| Schedule | | | | 1 | 0.494 ^{**} | 0.556 ^{**} | 0.174 | −0.041 |
| Health | | | | | 1 | 0.598 ^{**} | 0.214 | −0.263 [*] |
| Zarit | | | | | | 1 | 0.218 | −0.232 [*] |
| GDS-15 | | | | | | | 1 | −0.471 ^{**} |
| SOC-13 | | | | | | | | 1 |

Notes. Pearson's correlation was computed between two continuous variables; Polychoric correlation was computed between two ordinal variables; and polyserial correlation was computed between a continuous and an ordinal variable.

Continuous variables were: Zarit, GDS-15 and SOC-13; ordinal variables were: Self-esteem, family, financial, schedule and health.

* p < 0.05.

** p < 0.01.

Table 3
Caregiver baseline characteristics by burden severity (N = 79).

| Variables | All caregivers (N = 79) | Low burden (n = 29) | High burden (n = 50) | p-value |
|---|-------------------------|---------------------|----------------------|---------|
| Age, years, mean ± SD | 79.4 ± 5.3 | 81.79 ± 5.3 | 78.1 ± 4.9 | < 0.01 |
| Gender: female, n (%) | 42 (53.2) | 13 (44.8) | 29 (58.0) | 0.26 |
| SOC highest quartile, n (%) | 22 (27.8) | 15 (51.7) | 7 (14.0) | < 0.01 |
| GDS > 5, n (%) | 24 (30.4) | 4 (13.8) | 20 (40.0) | 0.01 |
| NPI highest quartile, n (%) | 21 (26.6) | 4 (13.8) | 17 (34.0) | 0.05 |
| Spouse's gratitude, n (%) | 50 (63.3) | 20 (69.0) | 30 (60.0) | 0.43 |
| Supervision > 2hours/day, n (%) | 65 (82.3) | 20 (69.0) | 45 (90.0) | 0.02 |
| Perturbed sleep, n (%) | 31 (39.2) | 7 (24.1) | 24 (48.0) | 0.04 |
| More dependent quartile care-recipient, n (%) | 22 (27.8) | 4 (13.8) | 18 (36.0) | 0.03 |
| Socio-economic status low quartile, n (%) | 20 (25.3) | 11 (37.9) | 9 (18.0) | 0.05 |
| Self-esteem > 3, n (%) | 55 (70.8) | 22 (75.9) | 33 (66.0) | 0.36 |

Notes. SOC: Sense of Coherence; GDS: Geriatric Depression Scale-15; NPI: Neuropsychiatric Inventory; KATZ: activities of daily living scale with lower scores indicating greater dependence (more dependent quartile (KATZ < 2/6); SD: standard deviation.

Burden was dichotomized into "low burden" (< 25/88 points) and "high burden" (> 24/88). This cut-off score has significant predictive validity for identifying caregivers who are at risk of depression (Schreiner et al., 2006).

Table 4
Factors associated with a higher caregiver burden in logistic regression (N = 79).

| Variable | Univariate analysis | | Multivariable analysis | |
|--------------------------|---------------------|---------|------------------------|---------|
| | OR (95%CI) | p-value | OR (95%CI) | p-value |
| Age, per additional year | 0.87 (0.79–0.96) | < 0.01 | 0.87 (0.76–0.98) | 0.03 |
| Gender, male | 0.59 (0.23–1.47) | 0.26 | | |
| SOC quartile sup | 0.15 (0.05–0.43) | < 0.01 | 0.18 (0.04–0.65) | 0.01 |
| GDS > 5 | 4.17 (1.36–15.76) | 0.02 | 3.40 (0.87–16.37) | 0.09 |
| NPI quartile sup | 3.22 (1.04–12.26) | 0.06 | 2.90 (0.71–14.90) | 0.16 |
| Supervision > 2 h/d | 4.05 (1.24–14.66) | 0.02 | | |
| Perturbed sleep | 2.9 (1.09–8.46) | 0.04 | | |
| KATZ > 8/24 | 4.90 (1.76–14.59) | < 0.01 | 8.69 (2.28–40.46) | < 0.01 |

Notes. SOC: Sense of Coherence; GDS: Geriatric Depression Scale-15; NPI: Neuropsychiatric Inventory; KATZ: activities of daily living scale with higher scores indicating greater dependence; OR: odds ratio; and 95% CI: 95% confidence interval.

Table 5
Caregiver baseline characteristics by SOC level (highest quartile) (N = 79).

| Variables | All caregivers (N = 79) | Low SOC (n = 57) | High SOC (n = 22) | p-value |
|--|-------------------------|------------------|-------------------|---------|
| Age, years, mean ± SD | 79.4 ± 5.3 | 78.5 ± 5.3 | 81.7 ± 4.9 | 0.01 |
| Gender: female, n (%) | 42 (53.2) | 32 (56.1) | 10 (45.5) | 0.39 |
| Socioeconomic lowest quartile, n (%) | 20 (25.3) | 15 (26.3) | 5 (22.7) | 0.74 |
| GDS > 5, n (%) | 24 (30.4) | 21 (36.8) | 3 (13.6) | 0.04 |
| Low-intermediate physical performance, n (%) | 48 (60.8) | 34 (59.6) | 14 (63.6) | 0.75 |
| Frail and prefrail, n (%) | 53 (67.1) | 37 (64.9) | 16 (72.7) | 0.51 |
| Risk of denutrition | 28 (35.4) | 21 (36.8) | 7 (31.8) | 0.68 |
| Charlson comorbidity index > 0, n (%) | 38 (48.1) | 28 (49.1) | 10 (45.5) | 0.94 |
| Pathologic clock test, n (%) | 35 (44.3) | 25 (43.9) | 10 (45.5) | 0.90 |
| Self-esteem > 3/5, n (%) | 55 (70.9) | 36 (63.2) | 19 (86.4) | 0.04 |
| Perturbed sleep, n (%) | 31 (39.2) | 26 (45.6) | 5 (22.7) | 0.06 |

Notes. The socioeconomic status was calculated as the sum of education, income and past occupation; GDS: Geriatric Depression Scale-15.

Table 6
Factors associated with a high sense of coherence in caregivers in the logistic regression.

| Variable | Univariate analysis | | Multivariable analysis | |
|-------------------|---------------------|---------|------------------------|---------|
| | OR (95%CI) | p-value | OR (95%CI) | p-value |
| Age, years | 1.12 (1.02–1.24) | 0.02 | 1.09 (0.98–1.21) | 0.11 |
| Gender, female | 0.65 (0.24–1.75) | 0.39 | | |
| GDS > 5/15 | 0.27 (0.07–1.02) | 0.05 | 0.29 (0.06–1.06) | 0.08 |
| Self-esteem > 3/5 | 3.69 (0.98–13.99) | 0.05 | 3.035 (0.792–16.12) | 0.09 |
| Perturbed sleep | 0.35 (0.11–1.08) | 0.07 | | |

Notes. GDS: Geriatric Depression Scale-15.

(Del-Pino-Casado, Pastor-Bravo, Palomino-Moral, & Frias-Osuna, 2017; Matthews, Dunbar-Jacob, Sereika, Schulz, & McDowell, 2004; Yee & Schulz, 2000).

More interestingly, a high SOC seems to be a protective factor for the caregiver burden. Previous studies performed in Sweden, Japan and Norway (Andren & Elmstahl, 2008; Matsushita et al., 2014; Stensletten et al., 2014) also showed that caregivers with a higher SOC reported a significantly lower burden. To measure the burden, they used the Relative Stress Scale (RSS) that is more frequently used in clinical research in Norway or an eight-item Japanese version of the ZBI. These results could indicate that caregivers who find caregiving meaningful,

manageable and comprehensive, although it is challenging, are likely to be less negatively affected by caregiving. In the same way, a Japanese study suggests that an increase in the “sense of life worth living” may play an important role in preventing caregiver burden (Okamoto, Momose, Fujino, & Osawa, 2009). This concept, called “Ikigai” in Japanese, is related to life-satisfaction, self-esteem and meaning in one’s life.

Consistent with other studies (Kontinen, Haukkala, & Uutela, 2008; Orgeta & Sterzo, 2013; Valimaki et al., 2009), we observed a high negative association between SOC and depressive symptoms ($r = -0.47$), raising the question of whether SOC is an inverse measure of depression. Correlations between SOC, GDS, socio-demographic and health variables suggest that SOC is separate construct (Appendix A). Indeed, the comparison of the correlations showed that SOC is the only construct that is correlated with age, socio-economic status and burden. Another Belgian study among individuals aged 80 years and older also countered the argument that SOC would be merely the inverse of depression (Boeckxstaens et al., 2016). However, the temporal relationship between the level of SOC and the appearance of depressive symptoms remains unclear. Since, individual with low SOC may be at risk for depression and increased stress (Valimaki et al., 2009).

Furthermore, SOC seems to increase with age (Eriksson & Lindstrom, 2005; Nilsson et al., 2010). It is not obvious whether this increase is linked to a natural selection of people or if people developing a high SOC are surviving longer. In another Belgian study, elderly persons with high SOC were shown to have lower mortality rates than the study population as a whole (Boeckxstaens et al., 2016).

A high SOC was associated with a lower subjective burden, but we were unable to show an association between a high SOC and better physical health. This is consistent with the review by Flensburg-Madsen et al., which found strong correlations between SOC and psychological aspects with only a few modest correlations with physical health (Flensburg-Madsen, Ventegodt, & Merrick, 2005).

4.1. Limitations

First, as these data are cross-sectional, we cannot establish causality between caregivers, the patient characteristics and burden. Second, many studies found that high SOC was a protective factor, which was most often when using the highest tertile or quartile, but we have no clear indication about which cut-off to use. Moreover, it is not clear if SOC is a fixed personality trait or whether it can be modified. Third, SOC could have been modified by the caregiver status. The different ways in which a person perceives his health and interprets the questions, based on cognitive psychological mechanisms, are called the response shift (Sprangers & Schwartz, 1999). These modifications include the changes in the caregiver’s values, the reprioritizing of his goals or the reframing of his expectations across the experience of caregiving. We wanted to assess the participants’ perceived burden and SOC, and coping is a part of the experience; therefore, an adjustment for the

response shift seems unnecessary. Finally, our sample of caregivers is a convenience sample that was mainly recruited through the geriatric outpatient clinic. Despite a few refusals to participate, there may be selection bias.

4.2. Perspectives

Our findings suggest the importance of further research about caregivers’ strengths instead of only their vulnerability. Other concepts have adopted the salutogenic approach, focusing on resources, such as the resilience, coping and stress management theories.

In clinical practice, it is important to be able to identify the most vulnerable caregivers, which could be based on SOC. On the other hand, the salutogenic approach could be more regularly applied in practice. Adoption of this concept of salutogenesis involves integrating people into the process of changes so that they arrange more spaces for decisions and develop their resistance resources. Some authors have suggested implementing the SOC concept in clinical practice by creating empowering dialogues to reinforce the strengths of individuals (Langeland et al., 2006; Malterud & Hollnagel, 1999). Interventions should help caregivers focus on the positive aspects of providing care and enhancing their feelings of competence.

5. Conclusion

Patient functional limitations in the activities of daily living are a strong predictor of the caregiver’s burden. However, having a high sense of coherence seems to be a protective factor against the burden. These results could indicate that caregivers who find caregiving meaningful, manageable and comprehensive, despite their caregiving burdens, are likely to be less negatively affected by caregiving. Our findings also showed that the SOC is not an inverse measure of depression. The task of caregiving should not only be approached as a stressful experience considering that 69% of the spousal caregivers consider caregiving as a source of self-fulfillment. To support caregivers, health professionals should not only screen them for depression or burden but also recognize their expertise and the meaning of their care situation to enhance positive feelings, such as self-esteem. Implementation of the SOC concept in clinical practice by creating empowering dialogues could reinforce the strengths of caregivers.

Conflicts of interest

None.

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Appendix A

See Table A1.

Table A1
Correlations between SOC, GDS and socio-demographic and health variables among caregivers.

| Socio-demographic and health variables (N = 79) | SOC | GDS |
|---|--------------------|-------|
| Gender # | 0.11 | −0.08 |
| Age ## | 0.28 [*] | −0.11 |
| Socio-economic score ## | 0.23 [*] | −0.18 |
| Burden ## | −0.23 [*] | 0.22 |
| SPPB ## | −0.001 | −0.13 |
| Nutrition ## | 0.14 | −0.14 |
| Frailty ### | −0.12 | 0.21 |

Notes. #: biserial correlation, ##: Pearson's correlation, ### polyserial correlation.

Correlations between SOC, GDS, socio-demographic and health variables suggest that SOC is not the inverse measure of depression. The comparison of the correlations showed that SOC is the only factor correlated with age, socio-economic status and burden.

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