

# The impact of psychological abuse on somatic symptoms: a study of older persons aged 60-84 years

Joaquim Jorge Fernandes Soares, Eija Viitasara, Gloria Macassa, Maria Gabriella Melchiorre, Mindaugas Stankunas, Jutta Lindert, Henrique Barros, Elisabeth Ioannidi-Kapolou and Francisco Torres-González

Joaquim Jorge Fernandes Soares is a Professor (Senior Researcher), Dr Eija Viitasara is a Senior Lecturer and Dr Gloria Macassa is a Professor, all are based at Health Sciences – Public Health, Mid Sweden University, Sundsvall, Sweden. Maria Gabriella Melchiorre is a Senior Researcher, based at I.N.R.C.A, Ancona, Italy. Dr Mindaugas Stankunas is a Professor, based at School of Public Health, Griffith University, Gold Coast Campus, Queensland, Australia. Jutta Lindert is a Professor, based at University of Emden, Emden, Germany. Professor Henrique Barros is based at University of Porto Medical School, Porto, Portugal. Professor Elisabeth Ioannidi-Kapolou is a Researcher, based at National School of Public Health, Athens, Greece. Professor Francisco Torres-González is a Senior Researcher, based at University of Granada, Granada, Spain.

J.J.F.S. devised the study; J.J.F.S. and E.V. conducted the analyses with input from ÖS; and all authors contributed to writing and revising the manuscript. All authors read and approved the final manuscript.

## Abstract

**Purpose** – The purpose of this paper is to examine differences in the experience of somatic symptoms by domain (exhaustion, musculoskeletal, gastrointestinal, heart distress) between psychologically abused and non-abused older persons, and to scrutinize associations between abuse and somatic symptoms while considering other factors (e.g. social support).

**Design/methodology/approach** – The design was cross-sectional. The participants were 4,467 women/men aged 60-84 years living in seven European cities. The data were analysed using bivariate/multivariate methods.

**Findings** – Psychologically abused participants scored higher on all somatic symptom domains than non-abused, and thus were more affected by the symptoms. The regressions confirmed a positive association between psychological abuse and most somatic symptom domains, but other factors (e.g. depression, anxiety) were more salient. Demographics/socio-economics were positively (e.g. marriage/cohabitation) or negatively (e.g. education) associated with somatic symptoms depending on the domain. Social support and family structure “protected” the experience of somatic symptoms.

**Research limitations/implications** – The research focused on psychological abuse. It did not incorporate other abuse types calling for further research on the effects of other abuse types on somatic symptoms. Nevertheless, the findings indicate that psychological abuse is linked to somatic symptoms, but the role of other factors (e.g. depression, anxiety, social support) is also important.

**Practical implications** – Improvements in the older person’s situation regarding somatic symptoms need to consider psychological abuse, co-morbidities, social support and living conditions.

**Originality/value** – The paper reports data from the ABUEL Survey, which collected population-based data on elder abuse.

**Keywords** Europe, Mental health, Older persons, Social support, Somatic symptoms, Psychological abuse

**Paper type** Research paper

## Background

Elder abuse is widespread, and may cut across social, economic, religious and cultural groups. A review of 49 studies on elder abuse (Cooper *et al.*, 2008) reported prevalence rates between 3.2-55 per cent depending on various factors (e.g. abuse type). More recently, a UK survey of abuse against persons aged 66 years and older during the past year (O’Keeffe *et al.*, 2007) found rates of 1.1 per cent for neglect, of 0.6 per cent for financial abuse, of 0.4 per cent for psychological and physical abuse (each) and of 0.2 per cent for sexual abuse. In Israel, a study of abuse towards Jewish and Arab adults aged 65 years and older during the past 12 months observed rates of total abuse/neglect of 35.2 and 34 per cent, respectively (Lowenstein *et al.*, 2009). A study from the USA among persons aged 60 years or older revealed that the one-year

prevalence of sexual abuse was 0.6 per cent, of physical abuse 1.6 per cent, of emotional abuse 4.6 per cent, of financial abuse 5.2 per cent and of potential neglect 5.1 per cent (Acierno *et al.*, 2010). A European survey (Macassa *et al.*, 2013) reported psychological abuse rates between 10.4 and 29.7 per cent depending on the country[1]. As above indicated there is great variation in prevalence rates between the studies, which may be due to differences in samples and the operational definition of abuse.

Abuse may significantly add to the health, social and financial strains of older age. Studies with different samples (e.g. community) indicate that elder abuse may be associated with various negative outcomes such as impairments, shorter survival rates, depression, posttraumatic stress disorder (PTSD) or low social support (e.g. Acierno *et al.*, 2010; Comijs *et al.*, 1999; Dong, 2005; Dong *et al.*, 2010; Fulmer, 2002; Kim *et al.*, 2005; Lachs *et al.*, 1997, 1998; O'Keeffe *et al.*, 2007; Podnieks, 1992; Wolf, 1997; Wu *et al.*, 2012; Yan and Tang, 2001). Thus, from being considered a "social welfare issue and a problem of ageing" (World Health Organization (WHO), 2002), abuse against older persons is actually a major public health issue.

In spite of a mounting number of studies on elder abuse, data about the physical and mental situation of psychologically abused[2] older persons remains scarce, although this abuse form may be the most commonly reported by elders, with prevalence rates up to 52 per cent (Cooper *et al.*, 2008; Macassa *et al.*, 2013). To our knowledge, few studies have addressed the linkage between psychological abuse and health among older persons, suggesting that it co-exists with previous trauma, depression, PTSD or distress (Acierno *et al.*, 2010; Kim *et al.*, 2005; Podnieks, 1992; Wolf, 1997; Wu *et al.*, 2012; Yan and Tang, 2001). Moreover, a study of intimate partner violence against adult women (including elderly) about emotional abuse (Kramer *et al.*, 2004) and another about psychological/emotional abuse against older women (Fischer and Regan, 2006) found that these abuse forms were associated with various ailments (e.g. stomach problems). The experience of somatic symptoms is common among older persons (Breivik *et al.*, 2006; Sha *et al.*, 2005; Wijeratne, 2011; Wijeratne *et al.*, 2006) and influenced by psychological and psychosocial strains (Kirmayer and Robbins, 1996; Simon *et al.*, 1999), although a few studies have observed small/no differences in the occurrence of somatic complaints between younger and older respondents (Escobar *et al.*, 1991; Kroenke and Price, 1993). The strain of psychological abuse could be thus an important element in their experience of somatic symptoms (e.g. pain), which has been previously reported by adult and older women abused by an intimate partner (Coker *et al.*, 2000, 2005; Fischer and Regan, 2006; Kramer *et al.*, 2004; WHO, 2002)[3].

The health of older persons is affected by various factors such as socio-economic conditions and social support (Abu-Rayya, 2006; Antonucci *et al.*, 1996; Borg *et al.*, 2006; Eikemo *et al.*, 2008; Huisman *et al.*, 2003; Kahn and Pearlin, 2006; König *et al.*, 2010; Mackenbach *et al.*, 2008; OECD, 2010; Schoenborn, 2004; White *et al.*, 2009). Thus, it seems important to consider aspects of the older person's situation (e.g. social support) when addressing psychological abuse and somatic symptoms. The examination of the impact of psychological abuse and other factors (e.g. social support) on the experience of somatic symptoms among a general population sample of women/men aged 60-84 years may be useful in several ways. For instance, psychological abuse may be the most frequent form of elder abuse (Cooper *et al.*, 2008), but there are scarce data on its health effects. Moreover, little is known about the health effects of psychological abuse while considering other factors (e.g. social support). By investigating these issues we may provide relevant data upon which policy makers and health-care staff can act to improve the well-being of older persons, but also to manage psychological abuse.

Thus, departing from the operational definition of psychological abuse (e.g. threatened to hit or throw something at you) as described in the Conflict Tactics Scale 2 (Straus *et al.*, 1996) and the UK study of abuse/neglect of older people (O'Keeffe *et al.*, 2007), our aims were to examine the experience of somatic symptoms by domain (exhaustion, musculoskeletal, gastrointestinal, heart distress) among psychologically abused and non-abused women/men aged 60-84 years from seven countries; and scrutinize by means of multiple linear regressions the association between psychological abuse and the experience of somatic symptoms by domain among all respondents, while considering other factors (e.g. social support).

## Methods

### *Participants*

The participants in the ABUEL study were women/men living in seven European cities (Stuttgart, Germany; Athens, Greece; Ancona, Italy; Kaunas, Lithuania; Porto, Portugal; Granada, Spain; Stockholm Sweden). Recruitment of the participants and data collection occurred during the period January-July 2009, but the data were ready for processing first in 2011 after input, creation of indexes, etc. Inclusion criteria were age 60-84 years, not suffering from cognitive (e.g. dementia) or sensory (e.g. blindness) impairments, living in own/rented housing or homes for elderly people and able to read/write or express themselves in the native languages (see Lindert *et al.*, 2012 for details). Characteristics of the participants are shown in Table I.

The sample size was estimated based on municipal census in each city and expected prevalence rates of abuse reported in previous surveys. Departing from a mean abuse prevalence of 13 per cent, with a precision of 2.6 per cent, derived from a recent review (Cooper *et al.*, 2008), a sample size of 633 persons in each city was required. A maximum of 656 persons was allowed for each city in view of the infinite population assumption. The sample size was adapted to each city according to their total population of women/men aged 60-84 years. The respondents were selected through random stratification by sex and age[4]. The overall and final sample consisted of 4,467 older persons (2,559 women, 57.3 per cent), with a mean response rate across countries of 45.2 per cent. Detailed information on the study are shown in a separate ABUEL method paper (Lindert *et al.*, 2012), i.e. design, sampling and assessments methods; the target population by country, sex and age; the persons eligible, cooperation, completion and response rates by country; the population fraction (PF) and population fraction ratio (PFR)[5] by country, sex and age in relation to the reference population; and the analyses (regression) of refusal data by country, sex and age. Overall, comparisons of the participants with the reference population in the community census database (age/sex) and refusal data (excluding Greece), showed that in Portugal more women than men responded to the survey and in Italy more women than men declined to participate. The youngest groups in all cities more often declined to participate. There were no other differences (see also Lindert *et al.*, 2012).

### *Measures*

The respondents completed scales covering various areas (e.g. somatic complaints). In this study, bivariate analyses are shown only for the relation between psychological abuse and the somatic symptoms by domain. Bivariate and multivariate analyses on differences between psychologically abused and non-abused respondents in demographics/socio-economics and other variables (e.g. social support) are shown in detail elsewhere (e.g. Macassa *et al.*, 2013).

Somatic symptoms were measured with the short version of the Giessen Complaint List (Brähler and Scheer, 1995). This consists of 24 questions (graded 0-4, not affected-very much affected). The symptoms are organized in four domains (six questions in each): exhaustion (e.g. tiredness); gastrointestinal (e.g. nausea); musculoskeletal (e.g. pains in joints or limbs); and heart distress (e.g. heavy, rapid or irregular heart-throbbing). The total score is 96. The higher the scores, the more one is affected. Cronbach's  $\alpha$ [6] for somatic symptoms across countries was 0.92[7].

Abuse was measured with 52 questions based on the Conflict Tactics Scale 2 (Straus *et al.*, 1996) and on the UK study of abuse/neglect of older people (O'Keeffe *et al.*, 2007). The questions are organized in five abuse sub-scales (psychological, physical, sexual, injury and financial). Additionally, other data were collected (e.g. neglect, perpetrator's characteristics). This study focused on the total responses regarding psychological abuse (11 items, e.g. threatened to hit or throw something at you). The respondents were asked if they had sustained these acts and how often they had occurred (chronicity). The acts of abuse may have occurred once, twice, three to five, six to ten, 11-20 or > 20 times during the past year, had not occurred the past year, prior to past year or had never occurred. When items were answered "this has never happened", the participant was coded as non-case (0). If the participant answered yes, it was a case (1). Cronbach's  $\alpha$  for psychological abuse across countries was 0.85.

**Table 1** Demographics/socio-economics, life-style and psychological abuse by country

Variables	Germany (n = 648)		Greece (n = 643)		Italy (n = 628)		Lithuania (n = 630)		Portugal (n = 656)		Spain (n = 636)		Sweden (n = 626)	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
<i>Age (years) (n)</i>														
60-64	137	21.1	179	27.8	141	22.5	146	23.2	161	24.5	148	23.2	212	33.9
65-69	184	28.4	165	25.7	142	22.6	148	23.5	160	24.4	140	22.0	149	23.8
70-74	152	23.5	147	22.9	129	20.5	146	23.2	138	21.0	143	22.5	106	16.9
75-79	104	16.0	94	14.6	119	18.9	121	19.2	115	17.5	113	17.8	83	13.3
80-84	71	11.0	58	9.0	97	15.4	69	11.0	82	12.5	92	14.5	76	12.1
<i>Sex (n)</i>														
Female	343	52.9	356	55.4	358	57.0	405	64.3	400	61.0	364	57.2	333	53.2
Male	305	47.1	287	44.6	270	43.0	225	35.7	256	39.0	272	42.8	293	46.8
<i>Marital status (n)</i>														
Single	65	10.0	33	5.1	24	3.8	28	4.4	37	5.6	40	6.3	43	6.8
Married/cohabitant	418	64.6	363	56.5	508	80.9	357	56.7	420	64.0	425	66.8	412	65.8
Divorced/separated	59	9.1	43	6.7	13	2.1	53	8.4	51	7.8	26	4.1	98	15.7
Widowed	105	16.3	204	31.7	83	13.2	192	30.5	148	22.6	145	22.8	73	11.7
<i>Living situation (n)</i>														
Alone	207	32.7	169	26.3	82	13.1	152	24.4	142	21.6	114	18.0	212	33.8
Spouse/partner	380	60.0	244	37.9	351	55.8	267	42.7	289	44.1	280	44.0	395	63.1
Spouse/partner/other <sup>a</sup>	33	5.1	117	18.2	157	25.0	92	14.8	143	21.8	147	23.2	16	2.6
Other <sup>b</sup>	14	2.2	113	17.6	38	6.1	113	18.1	82	12.5	94	14.8	3	0.5
<i>Housing (n)</i>														
Own	402	62.2	489	76.0	489	89.6	618	98.1	351	53.5	536	84.3	453	72.4
Rental	233	36.1	149	23.2	52	9.5	7	1.1	265	40.4	55	8.6	169	27.0
Other <sup>c</sup>	11	1.7	5	0.8	5	0.9	5	0.8	40	6.1	45	7.1	4	0.6
<i>Migrant background (n)</i>														
Yes	79	12.3	17	2.7	13	2.1	26	4.1	17	2.6	1	0.2	85	13.6
No	561	87.7	621	97.3	615	97.9	604	95.9	639	97.4	633	99.8	538	86.4
<i>Education (n)</i>														
Cannot read/write	1	0.2	17	2.6	1	0.2	1	0.2	17	2.6	100	15.7	1	0.1
Low education <sup>d</sup>	20	3.1	305	47.4	243	38.7	180	28.6	297	45.3	364	57.2	207	33.1
Middle education <sup>e</sup>	405	62.9	261	40.6	316	50.3	283	44.9	237	36.1	73	11.5	207	33.1
High education <sup>f</sup>	218	33.8	60	9.3	68	10.8	166	26.3	105	16.0	99	15.6	211	33.7
<i>Profession (n)</i>														
Blue-collar	91	14.4	235	36.5	160	25.5	248	39.4	216	32.9	236	37.1	91	15.6
Low white collar	249	39.4	120	18.7	221	35.2	136	21.6	186	28.4	79	12.4	223	35.6
High/middle white-collar	250	39.5	60	9.3	124	19.7	211	33.5	212	32.3	102	16.0	258	44.2
Armed forces/police	1	0.2	15	2.4	12	1.9	0	0	1	0.2	12	1.9	4	0.7
At home	41	6.5	213	33.1	111	17.7	35	5.5	41	6.2	207	32.6	8	1.4
<i>Financial support (n)</i>														
Working	68	10.6	93	14.5	27	4.3	58	9.2	55	8.5	55	8.6	186	29.8
Work pension	500	77.4	323	50.2	466	74.2	535	84.9	405	61.8	290	45.6	420	67.2
Social/sick/other pension benefits <sup>g</sup>	16	2.5	17	2.6	15	2.4	35	5.6	84	12.8	64	10.0	12	1.9
Spouse/partner income	34	5.4	187	29.1	118	18.8	0	0	70	10.6	212	33.3	6	0.8
Other <sup>h</sup>	26	4.1	23	3.6	2	0.3	2	0.3	40	6.3	15	2.5	2	0.3
<i>Still work (n)</i>														
Yes	110	17.1	81	12.6	58	9.2	100	15.9	116	17.7	71	11.1	215	34.3
No	532	82.9	562	87.4	570	90.8	530	84.1	540	82.3	373	58.9	411	65.7
<i>Financial strain (n)</i>														
Yes	307	47.5	602	93.6	367	58.6	461	73.2	461	70.3	434	68.2	225	36.0
No	339	52.5	41	6.4	259	41.4	169	26.8	195	29.7	202	31.8	400	64.0
<i>Smoking (n)</i>														
Yes	67	10.4	153	23.8	79	12.6	71	11.3	40	6.1	63	9.9	63	10.1
No	579	89.6	490	76.2	549	87.4	559	88.7	616	93.9	573	90.1	561	89.9
<i>Drinking (n)</i>														
Yes	534	82.5	266	41.4	437	69.6	316	50.2	527	80.3	222	34.9	564	90.4
No	113	17.5	337	58.6	191	30.4	314	49.8	129	19.7	414	65.1	60	9.6
<i>Psychological abuse<sup>i</sup></i>														
Yes	175	27.1	85	13.2	65	10.4	155	24.6	144	21.9	73	11.5	186	29.7

Notes: <sup>a</sup>Daughter; <sup>b</sup>daughter; <sup>c</sup>housing for older persons; <sup>d</sup>primary school/similar; <sup>e</sup>secondary school/similar; <sup>f</sup>university/similar; <sup>g</sup>sick pension; <sup>h</sup>own capital; <sup>i</sup>psychological abuse was more common in Germany, Lithuania, Portugal and Sweden ( $p < 0.001$ , see Macassa *et al.*, 2013 for details)

Depressive and anxiety symptoms were measured with the Hospital Anxiety and Depression Scale (Zigmond and Snaith, 1983). This consists of 14 questions (graded 0-3), with seven questions about depression (e.g. I feel as if I am slowed down) and seven about anxiety (e.g. I get sudden feelings of panic). The total score for depression and anxiety is 21, each. High scores correspond to high depression and anxiety levels. This study focused on total scores. Cronbach's  $\alpha$  for anxiety across countries was 0.81 and for depression 0.80.

Social support was measured with the Multidimensional Scale of Perceived Social Support (Zimet *et al.*, 1988). This consists of 12 questions (graded 1-7) divided into three domains, i.e. support from family, significant others and friends. The total score is 84. High scores correspond to high social support. This study focused on the total scores. Cronbach's  $\alpha$  for social support across countries was 0.92.

Health care use was measured by the number of contacts with different types of health care staff (e.g. physician) and health-care services (e.g. primary care). We assessed also the number of diseases (e.g. diabetes), which the participants were suffering from presently. The items were derived from the Stockholm's health survey (Folkhälsorapport, 2007).

Life-style variables were measured in terms of alcohol and cigarette use, and body mass index (BMI). Alcohol was measured with a modified version of the Alcohol Use Disorders Identification Test (Babor *et al.*, 2001) consisting of five questions (e.g. do you drink alcohol). A similar strategy was applied for the measurement of cigarette use. This study focused on use of alcohol and cigarettes in a yes/no format. BMI, based on self-reported height and weight, was computed for each person with the formula  $\text{kg/m}^2$ .

Demographic/socio-economic, household and religion variables were assessed, i.e. country (Germany, Greece, Italy, Lithuania, Portugal, Spain, Sweden), age (60-64, 65-69, 70-74, 75-79, 80-84 years), sex (female, male), marital status (single, married/cohabitant, divorced/separated), migrant background (yes, no), education (cannot read/write, low education, middle education, high education), profession (blue-collar, low white collar, high/middle white-collar, armed forces/police, at home), financial support (work, work pension, social/sick-leave/other pension benefits, spouse/partner income, other), financial strain (yes, no), housing (own, rental, other), living situation (alone, spouse/partner, spouse/partner/other, other), household size (number of persons) and if still in work (yes, no). Financial strain (worries about how to make ends meet) was measured with one item in a "no/sometimes/often/always" format. A participant was defined as experiencing "financial strain" if she/he selected any response other than no. Four questions (e.g. birth place) measured whether the participants were indigenous inhabitants or migrants. Religion was assessed with two questions, i.e. do you consider yourself a religious person? (not at all-considerably) and if you consider yourself a religious person: What religion do you belong to or feel attached to? (e.g. Protestant). This study focused on the first question in a "not at all/somewhat/moderately/considerably" format. A participant was considered religious if she/he selected any response other than not at all. The demographic/socio-economic questions were customized for each country, but similar in content.

### ***Design/procedure***

The design was cross-sectional. The selection of participants and data collection were conducted during January-July 2009. The data were available for processing 2011 after input and creation of indexes, etc. The data were collected in seven European cities (Elder abuse: a multinational prevalence survey, ABUEL) by face-to-face interviews (on average one hour) or a combination of interviews/self-response[8]. All scales (if not available in the relevant languages), were translated into the relevant languages, back-translated and culturally adapted. A similar procedure was used for other materials (e.g. information letters). Interviewers in each city ( $n = 5-20$ ) were trained in various issues (e.g. ethical behaviour). The participants were carefully informed about the study and what was expected of them in writing/verbally, and informed consent was requested[9]. Great emphasis was put on confidentiality, anonymity and the participant's rights. The respondents could stop data collection at any time. Ethical permission (similar application, but customized for each country) was sought and received in each country[10] (for more details see Lindert *et al.*, 2012).

### Statistical analyses

Differences in the experience of somatic symptoms by domain (exhaustion, musculoskeletal, gastrointestinal, heart distress) between psychologically abused and non-abused respondents were analysed with analyses of variance (ANOVA). The significance levels for the bivariate/multivariate analyses was at  $p < 0.05$ [11].

Four multiple linear regression analyses were conducted to examine the relationship between the dependent variables (exhaustion, musculoskeletal, gastrointestinal, heart distress symptoms) and covariates (independent variables) among all participants. The selection of the independent variables was based on statistical inference, i.e. variables that differentiated psychologically abused and non-abused respondents in previous analyses (e.g. Macassa *et al.*, 2013). The independent variables (see section measures) consisted of country, age, marital status, living situation, education, profession, financial support (e.g. pension), still in work, financial strain, alcohol use, BMI, religion, health care use, number of diseases, depression, anxiety and social support. Moreover, we added psychological abuse. When appropriate we performed “dummy coding” of the independent variables. The associations between the independent variables and dependent variable were expressed as standardized  $\beta$ 's, confidence intervals (CI 95 per cent) and  $R^2$  (goodness of fit of the models). Collinearity diagnostics of the regressions were conducted and the values were in acceptable levels (see Table III). Analyses were carried out using the SPSS statistical package 20 (IBM Corporation, 1989/2011).

## Results

### Psychological abuse and somatic symptoms

As shown in Table II, psychologically abused respondents contrasted with non-abused reported higher mean scores in exhaustion, e.g. tiredness ( $F(1, 4,465) = 78.63, p < 0.0001$ ), musculoskeletal, e.g. pains in joints or limbs ( $F(1, 4,465) = 50.75, p < 0.0001$ ), gastrointestinal, e.g. nausea ( $F(1, 4,465) = 33.23, p < 0.0001$ ) and heart distress, e.g. heavy, rapid or irregular heart-throbbing ( $F(1, 4,465) = 72.91, p < 0.0001$ ) symptoms. Thus, the abused respondents felt more affected by the different symptoms than non-abused.

### Factors associated with somatic symptoms

As shown in Table III, exhaustion symptoms (e.g. tiredness) were more likely to be experienced by respondents from Lithuania and Portugal compared with those from the reference country (Germany), the oldest ages (75-79/80-84 years) compared with the youngest (60-64 years), married/cohabitants compared with single people and financially supported by social/sickness/other pension benefits compared with work pension. Similar findings were found for respondents who felt financially strained compared with non-financially strained, more often used health-care, had a higher number of diseases and BMI, and experienced depression, anxiety and psychological abuse.

**Table II** Means/SD of somatic complaints by domain (GGB-24<sup>a</sup>, exhaustion, musculoskeletal, gastrointestinal, heart distress) among older persons aged 60-84 years by psychological abuse

Variables	Abused		Not abused	
	n	CI95%	n	CI95%
Exhaustion <sup>b</sup>	883		3,584	
Mean ± SD	12.32 ± 5.79	11.93-12.69	10.57 ± 5.08	10.40-10.73
Musculoskeletal <sup>b</sup>	883		3,584	
Mean ± SD	13.73 ± 5.81	13.35-14.12	12.26 ± 5.36	12.09-12.45
Gastrointestinal <sup>b</sup>	883		3,584	
Mean ± SD	8.65 ± 3.69	8.40-8.89	7.94 ± 3.11	7.84-8.04
Heart distress <sup>b</sup>	883		3,584	
Mean ± SD	9.66 ± 4.44	9.37-9.96	8.46 ± 3.53	8.35-8.58

Notes: <sup>a</sup>GGB, Giessen Complaint Questionnaire; <sup>b</sup>sub-scales, 0-24 each one

**Table III** Multiple linear regression analyses (standardized betas) and 95 per cent CI of the association between country, demographic/socio-economic, life-style, religion, health care use, physical diseases, depression, anxiety, social support, psychological aggression and somatic symptoms (GBB<sup>a</sup>, exhaustion, musculoskeletal, gastrointestinal, heart distress) among all older persons aged 60-84 years

Independent variables	Exhaustion		Musculoskeletal		Gastrointestinal		Heart distress	
	$\beta$	CI95%	$\beta$	CI95%	$\beta$	CI95%	$\beta$	CI95%
<i>Country<sup>b</sup></i>								
Greece	-0.030	-1.018/0.116	-0.108****	-2.266/-1.035	-0.008	-0.498/0.350	-0.023	-0.673/0.187
Italy	-0.084****	-1.738/-0.724	-0.036	-1.087/0.013	-0.066**	-0.975/-0.217	-0.081****	-1.222/-0.454
Lithuania	0.061****	0.333/1.381	0.003	-0.530/0.607	0.034	-0.098/0.685	0.168****	1.282/2.076
Portugal	0.132****	1.374/2.238	0.045*	0.110/1.208	0.023	-0.177/0.579	0.021	-0.169/0.598
Spain	0.016	-0.312/0.848	0.030	-0.116/1.142	-0.038	-0.819/0.047	-0.031	-0.801/0.078
Sweden	-0.001	-0.531/0.489	-0.084****	-1.824/-0.718	-0.056**	-0.888/-0.126	-0.041*	-0.821/-0.048
<i>Germany<sup>c</sup></i>								
<i>Age<sup>b</sup></i>								
65-69	-0.018	-0.589/0.163	0.001	-0.412/0.403	-0.010	-0.352/0.210	0.012	-0.177/0.392
70-74	0.027	-0.060/0.756	-0.005	-0.513/0.371	-0.020	-0.461/0.149	0.002	-0.289/0.328
75-79	0.063****	0.450/1.342	0.019	-0.201/0.766	0.002	-0.314/0.352	0.035*	0.012/0.688
80-84	0.040*	0.154/1.146	0.011	-0.354/0.722	-0.046*	-0.831/-0.089	0.005	-0.318/0.433
<i>60-64<sup>c</sup></i>								
<i>Marital status<sup>b</sup></i>								
Married/cohabitant	0.100*	0.144/2.051	0.078	-0.150/1.918	0.150**	0.301/1.726	0.113*	0.162/1.606
Divorced/separated	0.030	-0.110/1.261	0.039*	0.036/1.523	0.048*	0.062/1.086	0.041*	0.047/1.085
Widow/er	0.043	-0.057/1.167	0.061*	0.156/1.483	0.030	-0.218/0.696	0.030	-0.186/0.741
<i>Single<sup>c</sup></i>								
<i>Living situation<sup>b</sup></i>								
Spouse/partner	-0.033	-1.020/0.118	-0.075	-1.744/0.138	-0.039	-0.820/0.0049	-0.032	-0.802/0.075
Spouse/partner/other <sup>g</sup>	-0.083*	-2.071/-0.254	-0.069*	-1.977/-0.008	-0.128***	-1.784/-0.427	-0.108**	-1.772/-0.396
Other <sup>f</sup>	0.003	-0.430/0.538	0.010	-0.344/0.706	-0.013	-0.505/0.218	-0.007	-0.456/0.276
<i>Alone<sup>c</sup></i>								
<i>Education<sup>b</sup></i>								
Low education <sup>l</sup>	0.040	-0.510/1.382	-0.093*	-2.065/-0.013	0.032	-0.496/0.918	0.085	-0.060/1.373
Middle education <sup>l</sup>	-0.015	-1.140/0.828	-0.159***	-2.802/-0.673	-0.005	-0.766/0.701	0.032	-0.502/0.986
High education <sup>k</sup>	0.001	-1.024/1.059	-0.138**	-2.929/-0.671	-0.041	-1.102/0.454	-0.011	-0.893/0.686
<i>Cannot read/write<sup>c</sup></i>								
<i>Profession<sup>b</sup></i>								
Blue-collar worker	0.011	-0.440/0.679	0.020	-0.369/0.845	-0.012	-0.500/0.336	0.018	-0.281/0.567
Low white-collar worker	-0.010	-0.693/0.466	-0.001	-0.634/0.622	-0.017	-0.555/0.310	0.017	-0.298/0.579
Middle/high white-collar worker	-0.010	-0.754/0.524	-0.027	-1.011/0.369	-0.002	-0.489/0.462	0.042	-0.139/0.825
Armed forces/police/similar	0.012	-0.703/1.872	0.002	-1.283/1.509	0.023	-0.262/1.662	0.028*	0.001/1.951
<i>Housewives/husbands<sup>c</sup></i>								
<i>Still work<sup>b</sup></i>								
Yes	-0.003	-0.569/0.484	-0.009	-0.694/0.447	0.018	-0.242/0.544	0.004	-0.361/0.436
<i>No<sup>c</sup></i>								
<i>Financial support<sup>b</sup></i>								
Work	-0.005	-0.695/0.542	0.003	-0.622/0.718	-0.016	-0.613/0.311	-0.017	-0.662/0.275
Social/sickness/other pension benefits <sup>l</sup>	0.055****	0.705/1.883	0.046***	0.469/1.746	0.053***	0.322/1.202	0.078****	0.852/1.744
Partner income	0.014	-0.312/0.773	0.075****	0.725/1.902	0.014	-0.255/0.555	0.011	-0.283/0.539
Other income <sup>m</sup>	0.002	-0.779/0.883	-0.004	-1.049/0.753	0.015	-0.314/0.928	0.012	-0.343/0.915
<i>Work pension<sup>c</sup></i>								
<i>Financial strain<sup>b</sup></i>								
Yes	0.027*	0.003/0.581	0.047***	0.213/0.840	0.037*	0.030/0.461	0.025	0.026/0.412
<i>No<sup>c</sup></i>								
<i>Drinking<sup>b</sup></i>								
Yes	-0.025	-0.568/0.022	-0.003	-0.348/0.292	0.005	-0.185/0.256	-0.022	-0.398/0.049
<i>No<sup>c</sup></i>								
<i>BMI<sup>d</sup></i>								
0.034**	0.012/0.075	0.079****	0.069/0.137	-0.026	-0.044/0.003	0.031*	0.004/0.051	
<i>Religious<sup>b</sup></i>								
Yes	0.005	-0.318/0.458	0.024	-0.062/0.779	0.009	-0.209/0.371	0.013	-0.154/0.434
<i>No<sup>c</sup></i>								
<i>Health care use<sup>d, n</sup></i>								
0.082****	0.104/0.198	0.102****	0.140/0.242	0.052****	0.023/0.093	0.055**	0.017/0.084	

(continued)

**Table III**

Independent variables	Exhaustion		Musculoskeletal		Gastrointestinal		Heart distress	
	$\beta$	CI95%	$\beta$	CI95%	$\beta$	CI95%	$\beta$	CI95%
Physical diseases <sup>d,o</sup>	0.219****	0.704/0.900	0.231****	0.764/0.976	0.213****	0.407/0.554	0.260****	0.604/0.753
Anxiety <sup>d,p</sup>	0.200****	0.220/0.302	0.220****	0.250/0.339	0.178****	0.112/0.173	0.244****	0.196/0.258
Depression <sup>d,p</sup>	0.243****	0.270/0.360	0.112****	0.100/0.197	0.054*	0.009/0.076	0.055**	0.017/0.084
Social support <sup>d,q</sup>	-0.035*	-0.023/-0.003	-0.032*	-0.023/-0.001	0.010	-0.005/0.010	-0.044**	-0.019/-0.004
Psychological abuse <sup>b</sup>								
Yes	0.052****	0.348/0.994	0.059****	0.438/1.139	0.029	-0.012/0.470	0.042**	0.144/0.634
No <sup>c</sup>								
R <sup>2</sup> (%)	45.2		38.8		19		37.9	

**Notes:** *n* = 3,730. <sup>a</sup>GBB, Giessen Complaint Questionnaire (0-96) and sub-scales (0-24); <sup>b</sup>categorical variables; <sup>c</sup>comparison category; <sup>d</sup>continuous variables; <sup>e</sup>daughter; <sup>f</sup>daughter; <sup>g</sup>housing for elderly; <sup>h</sup>number of persons living in the household; <sup>i</sup>primary school/similar; <sup>j</sup>secondary school/similar; <sup>k</sup>university/similar; <sup>l</sup>sick pension; <sup>m</sup>own capital; <sup>n</sup>number of visits; <sup>o</sup>number of diseases, e.g. asthma; <sup>p</sup>HADS, 0-24; <sup>q</sup>MSPSS, 12-84. VIF's for exhaustion ranged from 1.065 to 7.542; for musculoskeletal symptoms from 1.062 to 7.069; for gastrointestinal symptoms from 1.061 to 8.743; and for heart distress from 1.058 to 8.643. \**p* < 0.05; \*\**p* < 0.01; \*\*\**p* < 0.001; \*\*\*\**p* < 0.0001

Exhaustion symptoms were less likely to be experienced by respondents from Italy compared with those from the reference country (Germany) and by those living with spouse/partner/other (e.g. daughter) compared with single persons, and higher social support. The model explained 45.2 per cent of the variation in exhaustion symptoms.

Musculoskeletal symptoms (e.g. pains in joints or limbs) were more likely to be experienced by respondents from Portugal compared with those from the reference country (Germany), by those who were divorced/separated and widow/er compared with single people, financially supported by social/sickness/other pension benefits and partners income compared with work pension and financially strained compared with non-financially strained. Similar findings were found for respondents who had a higher number of diseases and BMI, more often used health-care, and experienced anxiety, depression and psychological abuse. Musculoskeletal symptoms were less likely to be experienced by respondents from Greece and Sweden compared with those from the reference country (Germany), by those who were educated (low, secondary, university/other) compared with those who could not read/write and higher social support. The model explained 38.8 per cent of the variation in musculoskeletal symptoms.

Gastrointestinal symptoms (e.g. nausea) were more likely to be experienced by respondents who were married/cohabitants and divorced/separated compared with single people and financially supported by social/sickness/other pension benefits compared with work pension. Similar findings were observed for individuals who felt financially strained compared with non-financially strained, more often used health-care, had a higher number of diseases, and experienced anxiety and depression. Gastrointestinal symptoms were less likely to be experienced by respondents from Italy and Sweden compared with those from the reference country (Germany), and by those living with a spouse/partner/other (e.g. daughter) compared with others. The model explained 19 per cent of the variation in gastrointestinal symptoms.

Heart distress symptoms (e.g. heavy, rapid or irregular heart-throbbing) were more likely to be experienced by respondents from Lithuania compared with those from the reference country (Germany), by those aged 75-79 years compared with the youngest (60-64 years), married/cohabitants and divorced/separated compared with single people, in the armed forces/police professional category compared with housewives/husbands and financially supported by social/sickness/other pension benefits compared with work pension. Similar findings were observed for individuals who had a higher number of diseases and BMI, more often used health-care, and experienced anxiety, depression and psychological abuse. Heart distress symptoms were less likely to be experienced by respondents from Italy and Sweden compared with those from the reference country (Germany), by those living with spouse/partner/other compared with other and

higher social support. The model explained 37.9 per cent of the variation in heart distress symptoms.

Our findings indicate that the presence of somatic symptoms may be derived to a great extent from factors such as exposure to abuse, being from one of the poorest countries of South Europe (Portugal), financial dependency on others for living conditions, and anxiety and depression.

## Discussion

### *Psychological abuse and somatic symptoms*

Psychologically abused respondents compared with non-abused were more often affected by all somatic symptom domains (e.g. exhaustion). Following regressions confirmed this association, except for gastrointestinal symptoms. However, the  $\beta$ -values indicated that the association of psychological abuse with the experience of somatic symptoms was smaller compared with that of other factors (e.g. mental health).

Our results may be the first to show that psychological abuse is related to somatic symptoms in a general population sample of both sexes, although earlier studies reveal that psychological abuse against older persons may co-exist with trauma, depression, PTSD or distress (Acierno *et al.*, 2010; Kim *et al.*, 2005; Podnieks, 1992; Wolf, 1997; Wu *et al.*, 2012; Yan and Tang, 2001), and with somatic symptoms (e.g. stomach problems) among older women abused by intimate partners (Kramer *et al.*, 2004) and abused older women (Fischer and Regan, 2006).

Psychological abuse involves such acts as being insulted, sworn, shouted or yelled at, excluded or ignored, having something destroyed and threats (e.g. being hit). These acts may have caused upsetting thoughts and feelings, and indeed be experienced as intrusive in the cognitions, emotions and well-being of the older persons. Over time this may have led to reduced self-esteem as well as feelings of worthlessness, powerlessness and helplessness, and subsequently to an array of exhaustion, musculoskeletal and heart distress symptoms, not least as the psychological abuse was inflicted primarily by significant others (e.g. children) and spouses/partners (71.2 per cent). Data from other areas (e.g. intimate partner violence) indicate that psychological abuse is associated with somatic symptoms (e.g. pain), at least among women (Coker *et al.*, 2000, 2005; Fischer and Regan, 2006; Kramer *et al.*, 2004; WHO, 2002). However, an inverse relationship is also possible. The somatic symptoms experienced by the participants may have been a too greater burden leading to irritation, anger and discontent for spouses/partners and significant others, and subsequently resulting in the occurrence of abuse. Previous data indicate that dependency due to physical/cognitive deficiencies (Lachs *et al.*, 1997) may increase the abuse "risk". Consequently, psychological abuse may act both as a "cause" and "effect" of somatic symptoms.

### *Country and somatic symptoms*

Compared with respondents from the reference country (Germany), those from Lithuania were more likely to experience exhaustion and heart distress symptoms, and those from Portugal exhaustion and musculoskeletal symptoms. On the other hand, respondents from Italy were less likely to experience exhaustion, gastrointestinal and heart distress symptoms, those from Sweden gastrointestinal, musculoskeletal and heart distress symptoms and those from Greece musculoskeletal symptoms.

There are limited data on the health of older persons in Portugal and Lithuania compared with that of their peers in Europe, but studies show that older persons from Portugal and Lithuania fare worse concerning several health factors (e.g. obesity) and self-rate their health lower than Swedish and Italian peers (Mladovsky *et al.*, 2009; OECD, 2010). Further, Portuguese elders report poorer health, more functional limitations and chronic diseases, and feel more depressed than peers from several of the countries included in our study, e.g. Spain, Sweden (Eikemo *et al.*, 2008; de Groot *et al.*, 2004; Olsen and Dahl, 2007; Van de Velde *et al.*, 2010). Lithuanians have reported poorer health than, for instance, peers in Sweden (Carlson, 1998) and Finland (Kasmel *et al.*, 2004). The reasons for this situation are multifactorial. For example, the problematic economic and social transition in Lithuania in the 1990s (from being a part of the Soviet Union to

independence and democracy), and poverty, inequalities and limited availability/accessibility to good welfare systems in Lithuania and Portugal may be important contributors to the poor health of their elders compared with those of other countries, e.g. Sweden (Carlson, 1998; Eikemo *et al.*, 2008; Ferreira, 2008; Jagger *et al.*, 2008; Kalèdienè *et al.*, 2008; Mackenbach *et al.*, 2008; Mladovsky *et al.*, 2009; OECD, 2010; Santana, 2002; Zaidi, 2010). The results concerning Greece may reflect differences between urban, semi-urban and rural areas, with older persons living in urban areas being less likely to experience musculoskeletal symptoms (Stranjalis *et al.*, 2004)[12]. Our country findings are unlikely to reflect cultural factors (e.g. cultural expressions of health/ill-health). For instance, despite Southern European countries sharing similar socio-cultural patterns, the different probabilities of reporting somatic symptoms seem to be more in accord with country “characteristics” (e.g. availability of good health care services, poverty) than with their cultural patterns.

### ***Demographics/socio-economics and somatic symptoms***

Compared with the youngest respondents (60-64 years), those aged 75-79 and 80-84 years were more likely to experience exhaustion and heart distress symptoms, respectively. This is in line with data showing that older persons often suffer from chronic diseases (e.g. cardiovascular) and complain of somatic symptoms (Barsky *et al.*, 2001; Breivik *et al.*, 2006; Gunzelmann *et al.*, 2006; Hartvigsen *et al.*, 2004; Ihlebaek *et al.*, 2002; Kasmel *et al.*, 2004; McFadden *et al.*, 2008; Sha *et al.*, 2005; Wijeratne, 2011; Wijeratne *et al.*, 2006). One explanation could be health inequalities based on background differences in occupational status, with persons of lower occupational status reporting more health problems (Marmot *et al.*, 1991). However, in our sample, being in the armed forces/police was the only occupation associated with heart distress symptoms, and these symptoms may reflect experienced strains in various contexts, e.g. work (Gershon *et al.*, 2009; Jones *et al.*, 2006; Kavanagh, 2005; Martinussen *et al.*, 2007). On the other hand, studies have reported small/no differences between younger and older respondents concerning the occurrence of somatic symptoms (Escobar *et al.*, 1991; Kroenke and Price, 1993). Older persons may be more able to cope with health problems than younger ones due to a long experience of handling life events (Jang *et al.*, 2004).

Compared with single respondents, married/cohabitant respondents were more likely to experience exhaustion, gastrointestinal and heart distress symptoms, divorced/separated heart distress, gastrointestinal and musculoskeletal symptoms, and widows/ers musculoskeletal symptoms. Living in an extended family constellation (spouse/partner/other) was associated with a lower likelihood of experiencing exhaustion, gastrointestinal and heart distress symptoms. The results concerning marriage/cohabitation are inconsistent with the literature, and those regarding divorce/separation and widowhood consistent. Indeed, several studies indicate that married adult persons, including older persons, have a better health status than adults who are never married, divorced/separated and widow/er, with the benefits persisting even after considering other factors, e.g. income level (Koball *et al.*, 2010; Schoenborn, 2004; Wood *et al.*, 2007). An explanation for the positive connection between marriage/cohabitation and somatic symptoms could be that the older persons were involved in dysfunctional intimate relationships, which led to bodily symptoms over time. Marital disharmony (e.g. occurrence of negative spousal behaviours) has been associated with poorer health among older persons (Bookwala, 2005; Umberson *et al.*, 2006). Living in an extended family constellation had a “protective” influence on the experience of all somatic symptom domains (except musculoskeletal), suggesting that this kind of family structure may offer multi-levels of support beneficial for the older persons. Studies indicate that living in extended families and/or receiving intergenerational support provides health benefits for older persons (Silverstein *et al.*, 2006; Turagabeci *et al.*, 2007), although the crucial element may be more the quality of the relationships in the family rather than the number of persons in it (Ryan and Willits, 2007).

Contrasted to financial support through work pension, being financially supported by social/sickness/other pension benefits was associated with an increased likelihood of experiencing all somatic symptom domains and financial support by the spouse's/partner's income with musculoskeletal symptoms. Being financially strained compared with non-financially strained was associated with exhaustion, gastrointestinal and musculoskeletal symptoms. These results

highlight the importance of personal economic resources for health. Additionally, the older person's dependence on social/sickness/other pension benefits and spouse's/partner's income for their daily living may reflect a low socio-economic status. Persons living in poor socio-economic conditions show higher morbidity/mortality across many diseases, experience more stressful life events and are exposed to more environmental stressors (Almeida *et al.*, 2005; Dalstra *et al.*, 2005; Gallo *et al.*, 2005; Matthews *et al.*, 2000; Schöllgen *et al.*, 2010), and have fewer psychosocial resources to deal with stressful events and experiences (Gallo and Matthews, 2003). However, the data concerning the relation between low socio-economic status, older age, health and mortality are inconsistent. Some authors report that socio-economic differences in morbidity decrease as individuals get older (House *et al.*, 1994), whereas others suggest they continue into old age (Foraker *et al.*, 2011). Regarding financial strain, evidence indicates that it indirectly/directly contributes to poor health, e.g. somatic symptoms (Kahn and Fazio, 2005; Lantz *et al.*, 2005; Soares *et al.*, 2003) and mortality (Szanton *et al.*, 2008). Strained financial resources may have led to reduced control or lack of control over important aspects of life (e.g. ability to fulfil needs necessary to maintain well-being). Over time this could have resulted in stress and negative emotions, and subsequently in poor health. An inverse relationship is also possible. Individuals with poor health (e.g. somatic symptoms) are more likely to be on special types of benefits (e.g. sick-leave), which are often a sign of economic strain (Hoedeman *et al.*, 2010; Ihlebaek *et al.*, 2002).

Compared with illiterate respondents, those having formal education (low, secondary, university/ other) were more likely to experience musculoskeletal symptoms. Our findings are at odds with observations that individuals with a low formal educational level compared with better educated have more musculoskeletal pain symptoms, report a worse clinical picture (e.g. more disability) and are less able to cope with the pain symptoms (Dionne *et al.*, 2001; Hagen *et al.*, 2005; Soares *et al.*, 2003). Our results are also at odds with studies showing no effects of formal education on pain symptoms (Dionne *et al.*, 2001; Hurwitz and Morgenstern, 1997; Picavet and Schouten, 2003). The lack of relationship between education and musculoskeletal problems could be related to the fact that such individuals may work/have worked in less physically demanding jobs, had more access to specialized health care services and used health care services more effectively (Dionne *et al.*, 2001).

### ***Life-style, health and somatic symptoms***

Higher BMI was associated with an increased likelihood of experiencing exhaustion, musculoskeletal and heart distress symptoms, which is in line with studies showing that excess weight is implicated in a range of health problems (e.g. cardiovascular deficiencies) among adults, including older adults (Andreyeva *et al.*, 2007; Bruffaerts *et al.*, 2008; Guh *et al.*, 2009; Heim *et al.*, 2008; Narayan *et al.*, 2007; Peytremann-Bridevaux and Santos-Eggimann, 2008; Renehan *et al.*, 2008). However, the mechanisms underlying the relationship between high BMI and poor health were not addressed here.

Higher scores in anxiety and depression, particularly anxiety, were independently associated with the experience of all somatic symptom domains. The co-morbidity between anxiety, depression and somatic symptoms is established in various samples, including older persons (Drayer *et al.*, 2005; Hanel *et al.*, 2009; Haug *et al.*, 2004; Kessler *et al.*, 2005; Lieb *et al.*, 2007; Lowe *et al.*, 2008; Penninx and Dyck, 2010). For instance, somatic symptoms such as fatigue and pains in the chest are included in the diagnostic features of depression and anxiety, which would account for the high rates of somatic symptoms in patients with these conditions (Haug *et al.*, 2004). Somatic symptoms may be the prominent presentation of anxiety and depressive symptoms (Sayar *et al.*, 2003; Simon *et al.*, 1999), psychological distress (e.g. depression) may be expressed through somatic symptoms (Drayer *et al.*, 2005) and decreased physical functioning often co-exists with anxiety and depression (de Graaf *et al.*, 2004). Moreover, persons with anxiety or depression may have lower thresholds for experiencing somatic symptoms, leading to a higher degree of symptom reporting in these conditions (Katon *et al.*, 1991). Patients with severe depression report more somatic symptoms than patients with mild depression, indicating a close link between the depression level and the reporting of somatic symptoms (Nakao *et al.*, 2001). Thus, our findings seem to be in line with the available literature.

Having a higher number of diseases (e.g. diabetes) was associated with an increased likelihood of experiencing all somatic symptom domains. This linkage may pertain, at least partly, to that the somatic symptoms reported by older persons have similarities to those of the diseases they suffer from. In fact, the type of physical diseases observed in our respondents is similar to that reported in numerous studies (Babatsikou and Zavatsanou, 2010; Jemal *et al.*, 2011; Lopez *et al.*, 2006; Shaw *et al.*, 2010; Truelsena *et al.*, 2006). Thus, the connection between physical diseases and somatic symptoms may be an expected finding.

Higher use of health care was associated with an increased likelihood of experiencing all somatic symptom domains. This association may reflect that older persons frequently use health care for their symptoms, including somatic symptoms, as shown by various studies (Ihlebaek *et al.*, 2002; Horney *et al.*, 2012; Ladwig *et al.*, 2000; Sha *et al.*, 2005).

### ***Social support and somatic symptoms***

Higher scores in social support were associated with a lower likelihood of experiencing all somatic symptom domains (except gastrointestinal). Social support is important for older persons who often rely on family, significant others and friends to help them with daily activities, provide companionship and care for their health and well-being, and could represent the principal source of personal care and well-being (Gray, 2009; Stroebe, 2000). Social support has been shown to positively influence the older person's physical and mental health, quality of life and survival, which may be achieved by the social support's strengthening of the older person's coping and recovery when ill or through biological processes that protect against illness (Abu-Rayya, 2006; Antonucci *et al.*, 1996; Borgonovi, 2010; Heffner *et al.*, 2011; Seeman, 2000; Stephens *et al.*, 2011; Uchino, 2006; Vink *et al.*, 2009; White *et al.*, 2009). Thus, our findings concerning the "protective" effect of social support on most of the somatic symptom domains seem to be in line with studies from other areas. The lack of relationship between social support and gastrointestinal symptoms may be due to the fact that the symptoms reflected serious chronic conditions not easily affected by social support.

### **Limitations**

This study has several limitations. First, the cross-sectional data does not allow drawing firm conclusions about causality, which would require another design type (e.g. longitudinal repeated-measures design). Second, the respondents were recruited in urban centres from seven specific European countries, and may not be representative for participants from non-urban areas as well as other countries in Europe and elsewhere (e.g. USA). Thus, the generalizability of our findings cannot be guaranteed. Third, the collected data were dependent on the participants' subjective assessments of their situation, and were not corroborated with objective measures. For example, the presence of somatic symptoms (e.g. back pain) was not objectively confirmed. Thus, our findings should be interpreted cautiously. Fourth, refusal rates varied greatly between cities and the total refusal rate was high, which could have led to the "selection" of respondents diverging from those in general (e.g. more severely ill persons may have refused). However, there were no major differences between the respondents and the reference population in the community census database (age/sex). Despite these weaknesses, the present study confirmed some previous findings and may have provided new insights into the experience of somatic symptoms, and its relation to psychological abuse and other factors (e.g. social support).

### **Conclusions**

A significant number of our respondents reported being affected by somatic symptoms, which were positively associated with psychological abuse and other factors (e.g. anxiety). Social support, family type and being from certain countries (e.g. Sweden) seemed to "protect" the experience of somatic symptoms. What emerges from our data are a relatively large number of respondents facing multi-strains requiring urgent attention. Their problems need synchronous interventions at various levels (e.g. individual, family) different methods (e.g. cognitive behaviour therapy), varying time frames and by various professionals (e.g. psychologists). In this context, our findings may be useful for health care planners/providers in their efforts to improve the health

situation and well-being of older persons in Europe. Further, health-care providers should be trained to probe for psychological abuse as part of their screening for older persons who present with the identified somatic symptoms and when not able to deal with the abuse to refer the older persons to appropriate counselling. Finally, although we have highlighted the importance of psychological abuse and other factors (e.g. mental health) for the experience of somatic symptoms, further research is needed. Such research should be longitudinal to firmly clarify the role of psychological abuse and of other factors (e.g. the cultural value/expression of somatic symptoms, living conditions) for the experience of somatic symptoms among older persons.

## Acknowledgement

The authors wish to express their thanks to the European Commission through the EAHC (Executive Agency for Health and Consumers) for the financial support, which made possible the realization of the ABUEL Project, "Elder Abuse: A multinational prevalence survey". Finally, the authors are especially grateful to the older persons who participated in the study, and for their kindness, efforts and answers.

## Notes

1. Some authors describe psychological abuse as emotional or verbal.
2. Sometimes called emotional or verbal.
3. Usually in the 18-65 years range.
4. Albeit representative and proportional to sex and age.
5. PF and PFR are used to describe and analyse heterogeneity between countries.
6. All = "Cronbach's  $\alpha$  [...] is a coefficient of internal consistency, [...] used as an estimate of the reliability of a psychometric test for a sample of examinees" Cronbach (1991).
7. All = figures are rather similar for each and every country.
8. The data set was first available for processing in January 2011 after input, creation of indexes, etc. Participants who did not want to do a face-to-face interview could self-respond and a questionnaire was sent to their homes. The self-response percentages were 38 per cent for Germany, 0.5 per cent for Greece, 0 per cent for Italy and Spain, 24.8 per cent for Lithuania, 2.3 per cent for Portugal and 63.9 per cent for Sweden.
9. Participants were informed before the interview and at the start of the interview, and could at any moment during the interview stop it. Self-responders were also informed before and if they changed their mind they did not need to send back the questionnaire.
10. Germany, Ethikkommission des Landes Baden-Wuerttemberg; Greece, QED and ICC/ESOMAR; Italy, Bioethics Advisory Committee of National Institute of Health and Science on Aging, INRCA; Lithuania, The Lithuanian State Data Protection Inspectorate and the Kaunas Regional Bioethics Committee; Portugal, Comité de Ética do Hospital de João; Spain, Comité de Ética en Investigación de la Universidad de Granada; Sweden, Regional Ethical Committee at Karolinska Institutet.
11. Notice that ANOVAs for all regression models were significant at  $p < 0.0001$ .
12. As far as we know that are no studies concerning the experience of musculoskeletal symptoms among older persons in Greece compared to other countries. The country data above mentioned may also pertain to younger age groups.

## References

- Abu-Rayya, H.M. (2006), "Depression and social involvement among elders", *Internet Journal of Health*, Vol. 5 No. 1, pp. 1-9.
- Acierno, R., Hernandez, M.A., Amstadter, A.B., Resnick, H.S., Steve, K., Muzzy, W. and Kilpatrick, D.G. (2010), "Prevalence and correlates of emotional, physical, sexual, neglectful, and financial abuse in the United States: the national elder mistreatment study", *American Journal of Public Health*, Vol. 100 No. 2, pp. 292-7.
- Almeida, D.M., Neupert, S.D., Banks, S.R. and Serido, J. (2005), "Do daily stress processes account for socioeconomic health disparities?", *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, Vol. 60B, pp. 34-9.

- Andreyeva, T., Michaud, P.C. and van Soest, A. (2007), "Obesity and health in Europeans aged 50 years and older", *Public Health*, Vol. 121 No. 7, pp. 497-509.
- Antonucci, T.C., Sherman, A.M. and Akiyama, H. (1996), "Social networks, support, and integration", in Birren, J.E. (Ed.), *Encyclopedia of Gerontology*, Academic Press, New York, NY, pp. 505-15.
- Babatsikou, F. and Zavatsanou, A. (2010), "Epidemiology of hypertension in the elderly", *Journal of Health Science*, Vol. 4 No. 1, pp. 24-30.
- Babor, T.F., Higgins-Biddle, J.C., Saunders, J.B. and Monteiro, M.G. (2001), *The Alcohol Use Disorders Identification Test: Guidelines for Use in Primary Care*, 2nd ed., World Health Organization Department of Mental Health and Substance Abuse, Geneva.
- Barsky, A.J., Peekna, H.M. and Borus, J.F. (2001), "Somatic symptom reporting in women and men", *Journal of General Internal Medicine*, Vol. 16 No. 4, pp. 266-75.
- Bookwala, J. (2005), "The role of marital quality in physical health during the mature years", *Journal of Aging and Health*, Vol. 17 No. 1, pp. 85-104.
- Borg, C., Hallberg, I.R. and Blomquist, K. (2006), "Life satisfaction among older people (65 +) with reduced self-care capacity: the relationship to social, health, and financial aspects", *Journal of Clinical Nursing*, Vol. 15 No. 5, pp. 607-18.
- Borgonovi, F. (2010), "A life cycle approach to the analysis of the relationship between social capital and health in Britain", *Social Sciences & Medicine*, Vol. 71 No. 11, pp. 1927-34.
- Brähler, E. and Scheer, J.W. (1995), *Der Gießener Beschwerdebogen (GGB) (2. Aufl)*, Huber, Bern.
- Breivik, H., Collett, B., Ventafridda, V., Cohen, R. and Gallacher, D. (2006), "Survey of chronic pain in Europe: prevalence, impact on daily life, and treatment", *European Journal of Pain*, Vol. 10 No. 4, pp. 287-333.
- Bruffaerts, R., Demyttenaere, K., Vilagut, G., Martinez, M., Bonnewyn, A., De Graaf, R., Haro, J.M., Bernert, S., Angermeyer, M.C., Brugha, T., Roick, C. and Alonso, J. (2008), "The relation between body mass index, mental health, and functional disability: a European population perspective", *Canadian Journal of Psychiatry*, Vol. 53 No. 10, pp. 679-88.
- Carlson, P. (1998), "Self-perceived health in East and West Europe: another European health divide", *Social Sciences & Medicine*, Vol. 46 No. 10, pp. 1355-66.
- Coker, A.L., Smith, P.H. and Fadden, M.K. (2005), "Intimate partner violence and disabilities among women attending family practice clinics", *Journal of Women's Health*, Vol. 14 No. 9, pp. 829-38.
- Coker, A.L., Smith, P.H., Bethea, L., King, M.R. and McKeown, R.E. (2000), "Physical health consequences of physical and psychological intimate partner violence", *Archives of Family Medicine*, Vol. 9 No. 5, pp. 451-7.
- Comijs, H.C., Penninx, B.W., Knipscheer, K.P. and van Tilberg, W. (1999), "Psychological distress in victims of elder mistreatment: the effects of social support and coping", *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, Vol. 54 No. 4, pp. 240-5.
- Cooper, C., Selwood, A.C. and Livingston, G. (2008), "The prevalence of elder abuse and neglect: a systematic review", *Age and Ageing*, Vol. 37 No. 2, pp. 151-60.
- Cronbach, L.J. (1991), "Coefficient alpha and the internal structure of tests", *Psychometrika*, Vol. 16 No. 3, pp. 297-334.
- Dalstra, J.A.A., Kunst, A.E., Borrell, C., Breeze, E., Cambois, E., Costa, G., Geurts, J.J.M., Lahelma, E., Van Oyen, H., Rasmussen, N.K., Regidor, E., Spadea, T. and Mackenbach, J.P. (2005), "Socioeconomic differences in the prevalence of common chronic diseases: an overview of eight European countries", *International Journal of Epidemiology*, Vol. 34 No. 2, pp. 316-26.
- de Graaf, R., Bijl, R.V., Ten Have, M., Beekman, A.T. and Vollebergh, W.A. (2004), "Pathways to comorbidity: the transition of pure mood, anxiety and substance use disorders into comorbid conditions in a longitudinal population-based study", *Journal of Affective Disorders*, Vol. 82 No. 3, pp. 461-7.
- de Groot, L., Verheijden, M.W., de Henauw, S., Schroll, M. and van Staveren, A. (2004), "Lifestyle, nutritional status, health, and mortality in elderly people across Europe: a review of the longitudinal results of the SENECA study", *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*, Vol. 59 No. 12, pp. 1277-84.

- Dionne, C.E., Von Korff, M., Koepsell, T.D., Deyo, R.A., Barlow, W.E. and Checkoway, H. (2001), "Formal education and back pain: a review", *Journal of Epidemiology and Community Health*, Vol. 55 No. 7, pp. 455-68.
- Dong, X.Q. (2005), "Medical implications of elder abuse and neglect", *Clinics in Geriatric Medicine*, Vol. 21 No. 2, pp. 293-313.
- Dong, X.Q., Beck, T. and Simon, M.A. (2010), "The associations of gender, depression and elder mistreatment in a community dwelling Chinese population: the modifying effect of social support", *Archives of Gerontology and Geriatrics*, Vol. 50 No. 2, pp. 202-8.
- Drayer, R.A., Mulsant, B.H., Lenze, E.J., Rollman, B.L., Dew, M.A., Kelleher, K., Karp, J.F., Begley, A., Schulberg, H.C. and Reynolds, C.F. 3rd. (2005), "Somatic symptoms of depression in elderly patients with medical comorbidities", *International Journal of Geriatric Psychiatry*, Vol. 20 No. 10, pp. 973-82.
- Eikemo, T., Huisman, M., Bambra, C. and Kunst, A. (2008), "Welfare state regimes and differences in self-perceived health in Europe: a multilevel analysis", *Social Sciences & Medicine*, Vol. 66 No. 11, pp. 2281-95.
- Escobar, J., Swartz, M., Rubico-Stipek, M. and Manu, P. (1991), "Medically unexplained symptoms: distribution, risk factors and comorbidity", in Kirmayer, L. and Robbins, J. (Eds), *Current Concepts of Somatization. Research and Clinical Perspectives*, American Psychiatric Press Inc., Washington, DC, pp. 63-78.
- Ferreira, L.V. (2008), "Persistent poverty: Portugal and the Southern European welfare regime", *European Societies*, Vol. 10 No. 1, pp. 49-71.
- Fischer, B.S. and Regan, S.L. (2006), "The extent and frequency of abuse in the lives of older women and their relationship with health outcomes", *Gerontologist*, Vol. 46 No. 2, pp. 200-9.
- Folkhälsorapport (2007), *Folkhälsan i Stockholms län 2007*, Centrum för folkhälsa, Stockholms läns landsting, Stockholm.
- Foraker, R.E., Rose, K.M., Chang, P.P., McNeill, A.M., Suchindran, C.M., Selvin, E. and Rosamond, W.D. (2011), "Socioeconomic status and the trajectory of self-rated health", *Age and Ageing*, Vol. 40 No. 6, pp. 706-11.
- Fulmer, T.T. (2002), "Elder mistreatment", *Annual Review of Nursing Research*, Vol. 20, pp. 369-95.
- Gallo, L.C. and Matthews, K.A. (2003), "Understanding the association between socioeconomic status and physical health: do negative emotions play a role?", *Psychological Bulletin*, Vol. 129 No. 1, pp. 10-51.
- Gallo, L.C., Bogart, L.M., Vranceanu, A. and Matthews, K.A. (2005), "Socioeconomic status, resources, psychological experiences, and emotional responses: a test of the reserve capacity model", *Journal of Personality and Social Psychology*, Vol. 88 No. 2, pp. 386-99.
- Gershon, R.R., Barocas, B., Canton, A.N., Li, X. and Vlahov, D. (2009), "Mental, physical, and behavioral outcomes associated with perceived work stress in police officers", *Criminal Justice and Behavior*, Vol. 36 No. 3, pp. 275-89.
- Gray, A. (2009), "The social capital of older people", *Ageing & Society*, Vol. 29 No. 1, pp. 5-31.
- Guh, D.P., Zhang, W., Bansback, N., Amarsi, C., Birmingham, C.L. and Anis, A.H. (2009), "The incidence of co-morbidities related to obesity and overweight: a systematic review and meta-analysis", *BMC Public Health*, Vol. 9 No. 1, pp. 1-20.
- Gunzelmann, T., Hinz, A. and Braehler, E. (2006), "Subjective health in older people", *GMS Psychosocial Medicine*, Vol. 3, pp. 1-10.
- Hagen, K., Zwart, J.A., Svebak, S., Bovim, G. and Stovner, L. (2005), "Low socioeconomic status is associated with chronic musculoskeletal complaints among 46,901 adults in Norway", *Scandinavian Journal of Public Health*, Vol. 33 No. 4, pp. 268-375.
- Hanel, G., Henningsen, P., Herzog, W., Sauer, N., Schaefer, R., Szecsenyi, J. and Löwe, B. (2009), "Depression, anxiety and somatoform disorders: vague or distinct categories in primary care? Results from a large cross-sectional study", *Journal of Psychosomatic Research*, Vol. 67 No. 3, pp. 189-97.
- Hartvigsen, J., Christensen, K. and Frederiksen, H. (2004), "Back and neck pain exhibit many common features in old age: a population-based study of 4,486 Danish twins 70-102 years of age", *Spine*, Vol. 29 No. 5, pp. 576-80.
- Haug, T.T., Mykletun, A. and Dahl, A.A. (2004), "The association between anxiety, depression, and somatic symptoms in a large population: the HUNT-II study", *Psychosomatic Medicine*, Vol. 66 No. 6, pp. 845-51.
- Heffner, K.L., Waring, M.E., Roberts, M.B., Eaton, C.B. and Gramling, R. (2011), "Social isolation, C-reactive protein, and coronary heart disease mortality among community-dwelling adults", *Social Sciences & Medicine*, Vol. 72 No. 9, pp. 1482-8.

- Heim, N., Snijder, M.B., Deeg, D.J., Seidell, J.C. and Visser, M. (2008), "Obesity in older adults is associated with an increased prevalence and incidence of pain", *Obesity*, Vol. 16 No. 11, pp. 2510-7.
- Hoedeman, R., Blankenstein, A.H., Krol, B., Koopmans, P.C. and Groothoff, J.W. (2010), "The contribution of high levels of somatic symptom severity to sickness absence duration, disability and discharge", *Journal of Occupational Rehabilitation*, Vol. 20 No. 2, pp. 264-73.
- Horney, C., Schmader, K., Sanders, L.L., Heflin, M., Ragsdale, L., McConnell, E., Hocker, M. and Hasting, S.N. (2012), "Health care utilization before and after an outpatient ED visit in older people", *American Journal of Emergency Medicine*, Vol. 30 No. 1, pp. 135-42.
- House, J.S., Lepkowski, J.M., Kinney, A.M., Mero, R.P., Kessler, R.C. and Herzog, A.R. (1994), "The social stratification of aging and health", *Journal of Health and Social Behavior*, Vol. 35 No. 3, pp. 213-34.
- Huisman, M., Kunst, A.E. and Mackenbach, J.P. (2003), "Socioeconomic inequalities in morbidity among the elderly; a European overview", *Social Sciences & Medicine*, Vol. 57 No. 5, pp. 861-73.
- Hurwitz, E.L. and Morgenstern, H. (1997), "Correlates of back problems and back-related disability in the United States", *Journal of Clinical Epidemiology*, Vol. 50 No. 6, pp. 669-81.
- IBM Corporation (1989/2011), *IBM SPSS Advanced Statistics 20*, IBM, Chicago. IL.
- Ihlebaek, C., Eriksen, H.R. and Ursin, H. (2002), "Prevalence of subjective health complaints (SHC) in Norway", *Scandinavian Journal of Public Health*, Vol. 30 No. 1, pp. 20-9.
- Jagger, C., Gillies, C., Moscone, F., Cambois, E., Van Oyen, H., Nusselder, J.W., Robine, J.M. and EHLEIS team (2008), "Inequalities in healthy life years in the 25 countries of the European Union in 2005: a cross-national meta-regression analysis", *Lancet*, Vol. 372 No. 9656, pp. 2124-31.
- Jang, Y., Poon, L.W. and Martin, P. (2004), "Individual differences in the effects of disease and disability on depressive symptoms: the role of age and subjective health", *International Journal of Aging and Human Development*, Vol. 59 No. 2, pp. 125-37.
- Jemal, A., Bray, F., Center, M.M., Ferlay, J., Ward, E. and Forman, D. (2011), "Global cancer statistics", *CA: A Cancer Journal for Clinicians*, Vol. 61 No. 2, pp. 69-90.
- Jones, M., Rona, R.J., Hooper, R. and Wessely, S. (2006), "The burden of psychological symptoms in UK armed forces", *Journal of Occupational Medicine*, Vol. 56 No. 5, pp. 322-8.
- Kahn, J.R. and Fazio, E.M. (2005), "Economic status over the life course and racial disparities in health", *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, Vol. 60 No. 2, pp. 76-84.
- Kahn, J.R. and Pearlin, L.I. (2006), "Financial strain over the life course and health among older adults", *Journal of Health and Social Behavior*, Vol. 47 No. 1, pp. 17-31.
- Kalėdienė, R., Petrauskienė, J. and Starkuvienė, S. (2008), "Inequalities in life expectancy by education and socioeconomic transition in Lithuania", *Medicina*, Vol. 44 No. 9, pp. 713-22.
- Kasmel, A., Helasoja, V., Lipand, A., Pratala, R., Klumbiene, J. and Pudule, I. (2004), "Association between health behavior and self-reported health in Estonia, Finland, Latvia and Lithuania", *European Journal of Public Health*, Vol. 14 No. 1, pp. 32-6.
- Katon, W., Lin, E., Von Korff, M., Russo, J., Lipscomb, P. and Bush, T. (1991), "Somatization: a spectrum of severity", *American Journal of Psychiatry*, Vol. 148 No. 1, pp. 34-40.
- Kavanagh, J. (2005), *Stress and Performance. A Review of the Literature and its Applicability to the Military*, Rand Corporation, Santa Monica, CA.
- Kessler, R.C., Beglund, P., Demler, O., Jin, R. and Walters, E.E. (2005), "Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication", *Archives of General Psychiatry*, Vol. 62 No. 6, pp. 593-602.
- Kim, O.S., Yang, K.M. and Kim, K.H. (2005), "Dependency, abuse and depression by gender in widowed elderly", *Journal of Korean Academy of Nursing*, Vol. 35 No. 2, pp. 336-43.
- Kirmayer, L.J. and Robbins, J.M. (1996), "Patients who somatize in primary care: a longitudinal study of cognitive and social characteristics", *Psychological Medicine*, Vol. 26 No. 5, pp. 937-51.
- Koball, H.L., Moiduddin, E., Henderson, J., Goesling, B. and Besculides, M. (2010), "What do we know about the link between marriage and health?", *Journal of Family Issues*, Vol. 31 No. 8, pp. 1019-40.
- König, H.H., Heider, D., Lehnert, T., Riedel-Heller, S.G., Angermeyer, M.C. and Matschinger, H. (2010), "Health status of the advanced elderly in six European countries: results from a representative survey using EQ-5D and SF-12", *Health and Quality of Life Outcomes*, Vol. 8 No. 143, pp. 1-11.

- Kramer, A., Lorenzon, D. and Mueller, G. (2004), "Prevalence of intimate partner violence and health implications for women using emergency departments and primary care clinics", *Women's Health Issues*, Vol. 14 No. 1, pp. 19-29.
- Kroenke, K. and Price, R.K. (1993), "Symptoms in the community: prevalence, classification, and psychiatric comorbidity", *Archives of Internal Medicine*, Vol. 153 No. 21, pp. 2474-80.
- Lachs, M.S., Williams, C., O'Brien, S., Hurst, L. and Horwitz, R. (1997), "Risk factors for reported elder abuse and neglect: a nine-year observational cohort study", *Gerontologist*, Vol. 37 No. 4, pp. 469-74.
- Lachs, M.S., Williams, C.S., O'Brien, S., Pillemer, K.A. and Charlson, M.E. (1998), "The mortality of elder mistreatment", *Journal of the American Medical Association*, Vol. 280 No. 5, pp. 428-32.
- Ladwig, K.H., Marten-Mittag, B., Formanek, B. and Dammann, G. (2000), "Gender differences of symptom reporting and medical health care utilization in the German population", *European Journal of Epidemiology*, Vol. 16 No. 6, pp. 511-8.
- Lantz, P.M., House, J.S., Mero, R.P. and Williams, D.R. (2005), "Stress, life events, and socioeconomic disparities in health: results from the American's changing lives study", *Journal of Health and Social Behavior*, Vol. 46 No. 3, pp. 274-88.
- Lieb, R., Meinlschmidt, G. and Araya, R. (2007), "Epidemiology of the association between somatoform disorders and anxiety and depressive disorders", *Psychosomatic Medicine*, Vol. 69 No. 9, pp. 860-3.
- Lindert, J., Luna, J., Torres-Gonzalez, F., Barros, H., Ioannidi-Kapolou, E., Quattrini, S., Stankunas, M. and Soares, J.J. (2012), "Study design, sampling and assessment methods of the European study 'abuse of the elderly in the European region'", *European Journal of Public Health*, Vol. 22 No. 5, pp. 662-6.
- Lopez, A.D., Mathers, C.D., Ezzati, M., Jamison, D.T. and Murray, C.J.L. (2006), *Global Burden of Disease and Risk Factors*, Oxford University Press and The World Bank, New York, NY.
- Lowe, B., Spitzer, R.L., Williams, J.B.W., Mussell, M., Schellberg, D. and Kroenke, K. (2008), "Depression, anxiety and somatization in primary care: syndrome overlap and functional impairment", *General Hospital Psychiatry*, Vol. 30 No. 3, pp. 191-9.
- Lowenstein, A., Eisikovits, Z., Band-Winterstein, T. and Enosh, G. (2009), "Is elder abuse and neglect a social phenomenon? Data from the First National Prevalence Survey in Israel", *Journal of Elder Abuse and Neglect*, Vol. 21 No. 3, pp. 253-77.
- McFadden, E., Luben, R., Bingham, S., Wareham, N., Kinmonth, A.L. and Khaw, K.T. (2008), "Social inequalities in self-rated health by age: cross-sectional study of 22,457 middle-aged men and women", *BMC Public Health*, Vol. 8 No. 2, pp. 230-8.
- Macassa, G., Viitasara, E., Sundin, Ö., Barros, H., Torres-Gonzalez, F., Ioannidi-Kapolou, E., Melchiorre, M.G., Lindert, J., Stankunas, M. and Soares, J.J.F. (2013), "Psychological abuse among older persons in Europe: a cross-sectional study", *Journal of Aggression, Conflict and Peace Research*, Vol. 5, pp. 16-34.
- Mackenbach, J.P., Stirbu, I., Roskam, A.R., Schaap, M.M., Menvielle, G., Leinsalu, M. and Kunst, A.E. (2008), "European Union Working Group on socioeconomic inequalities in health. Socioeconomic inequalities in health in 22 European countries", *New England Journal of Medicine*, Vol. 358 No. 23, pp. 2468-81.
- Marmot, M.G., Stansfield, S., Patel, C., North, F., Head, J., White, I., Brunner, E. and Feeney, A. (1991), "Health Inequalities among British civil servants: the Whitehall II study", *Lancet*, Vol. 337 No. 8754, pp. 1387-93.
- Martinussen, M., Richardsen, A.M. and Burke, R.J. (2007), "Job demands, job resources, and burnout among police officers", *Journal of Criminal Justice*, Vol. 35 No. 3, pp. 239-49.
- Matthews, K.A., Raikonen, K., Everson, S.A., Flory, J.D., Marco, C.A., Owens, J.F. and Lloyd, C.E. (2000), "Do the daily experiences of healthy men and women vary according to occupational prestige and work strain?", *Psychosomatic Medicine*, Vol. 62 No. 3, pp. 346-53.
- Mladovsky, P., Allin, S., Masseria, C., Hernández-Quevedo, C., McDaid, D. and Mossialos, E. (2009), *Health in the European Union: Trends and Analysis*, European Observatory on the Social Situation and Demography, European Commission, Directorate-General for Employment, Social Affairs and Equal Opportunities, Brussels.
- Nakao, M., Yamanaka, G. and Kubecki, T. (2001), "Major depression and somatic symptoms in a mind/body clinic", *Psychopathology*, Vol. 34 No. 5, pp. 230-5.

- Narayan, K.M.V., Boyle, J.P., Thompson, T.J., Gregg, E.W. and Williamson, D.F. (2007), "Effect of BMI on lifetime risk for diabetes in the US", *Diabetes Care*, Vol. 30 No. 6, pp. 1562-6.
- OECD (2010), *Health at a Glance: Europe 2010*, OECD Publishing, Paris.
- O'Keeffe, M., Hills, A., Doyle, M., McCreddie, C., Scholes, S. and Constantine, R. (2007), *UK Study of Abuse and Neglect of Older People: Prevalence Survey Report*, Department of Health, London.
- Olsen, K.M. and Dahl, S.Å. (2007), "Health differences between European countries", *Social Sciences & Medicine*, Vol. 64 No. 8, pp. 1665-78.
- Penninx, B.W. and Dyck, R. (2010), "Depression and somatic comorbidity", *Nederlands Tijdschrift voor Geneeskund*, Vol. 154, A1784.
- Peytremann-Bridevaux, I. and Santos-Eggimann, B. (2008), "Health correlates of overweight and obesity in adults aged 50 years and over: results from the Survey of Health, Ageing and Retirement in Europe (SHARE)", *Swiss Medical Weekly*, Vol. 138 Nos 17-18, pp. 261-6.
- Picavet, H.S.J. and Schouten, J.S.A.G. (2003), "Musculoskeletal pain in the Netherlands: prevalence, consequences and risk groups, the DMC<sub>3</sub>-study", *Pain*, Vol. 102 No. 1, pp. 167-78.
- Podnieks, E. (1992), "National survey on abuse of the elderly in Canada", *Journal of Elder Abuse and Neglect*, Vol. 4 Nos 1-2, pp. 5-58.
- Renahan, A.G., Tyson, M., Egger, M., Heller, R.F. and Zwahlen, M. (2008), "Body-mass index and incidence of cancer: a systematic review and meta-analysis of prospective observational studies", *Lancet*, Vol. 371 No. 9612, pp. 569-78.
- Ryan, A.K. and Willits, F.K. (2007), "Family ties, physical health, and psychological well-being", *Journal of Aging and Health*, Vol. 19 No. 6, pp. 907-20.
- Santana, P. (2002), "Poverty, social exclusion and health in Portugal", *Social Sciences & Medicine*, Vol. 55 No. 1, pp. 33-45.
- Sayar, K., Kirmayer, L.J. and Taillefer, S.S. (2003), "Predictors of somatic symptoms in depressive disorder", *General Hospital Psychiatry*, Vol. 25 No. 2, pp. 108-14.
- Schoenborn, C. (2004), *Marital Status and Health. CDC Advance Data from Vital and Health Statistics, 351*, National Center for Health Statistics, US Department of Health and Human Services, Washington, DC.
- Schöllgen, I., Huxhold, O. and Tesch-Römer, C. (2010), "Socioeconomic status and health in the second half of life: findings from the German Ageing Survey", *European Journal of Ageing*, Vol. 7 No. 1, pp. 17-28.
- Seeman, T.E. (2000), "Health promoting effects of friends and family on health outcomes in older adults", *American Journal of Health Promotion*, Vol. 14 No. 6, pp. 362-70.
- Sha, M.C., Callahan, C.M., Counsell, S.R., Westmoreland, G.R., Stump, T.E. and Kroenke, K. (2005), "Physical symptoms as a predictor of health care use and mortality among older adults", *American Journal of Medicine*, Vol. 118 No. 3, pp. 301-6.
- Shaw, J.E., Sicree, R.A. and Zimmet, P.Z. (2010), "Global estimates of the prevalence of diabetes for 2010 and 2030", *Diabetes Research and Clinical Practice*, Vol. 87 No. 1, pp. 4-14.
- Silverstein, M., Gans, D. and Yang, F.M. (2006), "Intergenerational support to aging parents: the role of norms and needs", *Journal of Family Issues*, Vol. 27 No. 8, pp. 1068-84.
- Simon, G.E., Von Korff, M., Piccinelli, M., Fullerton, C. and Ormel, J. (1999), "An international study of the relation between somatic symptoms and depression", *New England Journal of Medicine*, Vol. 341 No. 18, pp. 1329-35.
- Soares, J.J.F., Sundin, O. and Grossi, G. (2003), "Age and musculoskeletal pain", *International Journal of Behavioral Medicine*, Vol. 10 No. 2, pp. 181-90.
- Stephens, C., Alpass, F., Towers, A. and Stevenson, B. (2011), "The effects of types of social networks, perceived social support, and loneliness on the health of older people: accounting for the social context", *Journal of Aging and Health*, Vol. 23 No. 6, pp. 887-911.
- Stranjalis, G., Tsamandouraki, K., Sakas, D.E. and Alamanos, Y. (2004), "Low back pain in a representative sample of Greek population: analysis according to personal and socioeconomic characteristics", *Spine*, Vol. 29 No. 12, pp. 1355-61.

- Straus, M.A., Hamby, S.L., BoneyMcCoy, S. and Sugarman, D.B. (1996), "The revised Conflict Tactics Scales (CTS2). Development and preliminary psychometric data", *Journal of Family Issues*, Vol. 17 No. 3, pp. 283-316.
- Stroebe, W. (2000), "Moderators of the stress-health relationship", in Stroebe, W. (Ed.), *Social Psychology and Health*, Open University Press, Philadelphia, PA, pp. 236-73.
- Szanton, S.L., Allen, J.K., Thorpe, R.J. Jr, Seeman, T., Bandeen-Roche, K. and Fried, L.P. (2008), "Effect of financial strain on mortality in community-dwelling older women", *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, Vol. 63 No. 6, pp. 369-74.
- Truelsena, T., Piechowski-Józwiak, B., Bonitaa, R., Mathersa, C., Bogousslavsky, J. and Boysend, G. (2006), "Stroke incidence and prevalence in Europe: a review of available data", *European Journal of Neurology*, Vol. 13 No. 6, pp. 581-98.
- Turagabeci, A.R., Nakamura, K., Kizuki, M. and Takano, T. (2007), "Family structure and health, how companionship acts as a buffer against ill health", *Health and Quality of Life Outcomes*, Vol. 5 No. 1, pp. 1-9.
- Uchino, B. (2006), "Social support and health: a review of physiological processes potentially underlying links to disease outcomes", *Journal of Behavioral Medicine*, Vol. 29 No. 4, pp. 377-87.
- Umberson, D., Williams, K., Powers, D.A., Liu, H. and Needham, B. (2006), "You make me sick: marital quality and health over the life course", *Journal of Health and Social Behavior*, Vol. 47 No. 1, pp. 1-16.
- Van de Velde, S., Bracke, P. and Levecque, K. (2010), "Gender differences in depression in 23 European countries. Cross-national variation in the gender gap in depression", *Social Sciences & Medicine*, Vol. 71 No. 2, pp. 305-13.
- Vink, D., Aartsen, M.J., Comijs, H.C., Heymans, M.W., Penninx, B.W., Stek, M.L. and Deeg, D.J. and Beekman, A.T. (2009), "Onset of anxiety and depression in the aging population: comparison of risk factors in a 9-year prospective study", *American Journal of Geriatric Psychiatry*, Vol. 17 No. 8, pp. 642-52.
- White, A.M., Philogene, G.S., Fine, L. and Sinha, S. (2009), "Social support and self-reported health status of older adults in the United States", *American Journal of Public Health*, Vol. 99 No. 10, pp. 1872-8.
- Wijeratne, C. (2011), "Somatization in older people", *Psychiatric Clinics of North America*, Vol. 34 No. 3, pp. 661-71.
- Wijeratne, C., Hickie, I. and Davenport, T. (2006), "Is there an independent somatic symptom dimension in older people?", *Journal of Psychosomatic Research*, Vol. 61 No. 2, pp. 197-204.
- Wolf, R.S. (1997), "Elder abuse and neglect: causes and consequences", *Journal of Geriatric Psychiatry*, Vol. 30 No. 1, pp. 153-74.
- Wood, R.G., Goesling, B. and Avellar, S. (2007), *The Effects of Marriage on Health: A Synthesis of Recent Research Evidence*, Mathematica Policy Research, Princeton, NJ.
- World Health Organization (WHO) (2002), *World Report on Violence and Health*, WHO, Geneva.
- Wu, L., Chen, H., Hu, Y., Xiang, H., Yu, X., Zhang, T., Zhongqiang, C. and Wang, Y. (2012), "Prevalence and associated factors of elder mistreatment in a rural community in People's Republic of China: a cross-sectional study", *PLoS ONE*, Vol. 7 No. 3, p.e33857.
- Yan, E.C. and Tang, C.S.K. (2001), "Prevalence and psychological impact of Chinese elder abuse", *Journal of Interpersonal Violence*, Vol. 16 No. 11, pp. 1158-74.
- Zaidi, A. (2010), "Poverty risks for older people in EU countries – an update", policy brief series, European Centre Vienna, Vienna.
- Zigmond, A.S. and Snaith, R.P. (1983), "The hospital anxiety and depression scale", *Acta Psychiatrica Scandinavica*, Vol. 67 No. 6, pp. 361-70.
- Zimet, G.D., Dahlem, N.W., Zimet, S.G. and Farley, G.K. (1988), "The multidimensional scale of perceived social support", *Journal of Personality Assessment*, Vol. 52 No. 1, pp. 30-41.

## Corresponding author

Professor Joaquim Jorge Fernandes Soares can be contacted at: [joaquim.soares@miun.se](mailto:joaquim.soares@miun.se)

---

To purchase reprints of this article please e-mail: [reprints@emeraldinsight.com](mailto:reprints@emeraldinsight.com)  
 Or visit our web site for further details: [www.emeraldinsight.com/reprints](http://www.emeraldinsight.com/reprints)