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Original Research Article

The relationship between abuse, psychosocial factors, and pain complaints among older persons in Europe

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ABSTRACT

Background and objective: Abuse and pain complaints are common among older persons. However, little is known about relationships between abuse (e.g. psychological) and pain complaints (e.g. backache) among older persons while considering other factors (e.g. depression). Therefore, the aim of this study was to determine these relationships.

Materials and methods: The design was cross-sectional. A total of 4467 women and men aged 60–84 years from Germany, Greece, Italy, Lithuania, Portugal, Spain, and Sweden answered questionnaires regarding various areas such as abuse, mental health (e.g. anxiety) and pain complaints (e.g. backache). The data were examined with bivariate (analyses of variance) and multivariate methods (linear regressions).

Results: The bivariate analyses showed that psychological abuse was connected with all pain complaints; physical with headache and head pressure; sexual with neck or shoulder pain and headache; injury with all complaints (except pain in joints or limbs); financial with pain in joints or limbs and head pressure; and overall abuse (one or more types) with all complaints (except headache). The regressions showed that psychological abuse increased

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the likelihood of being affected by head pressure and heaviness or tiredness in the legs; physical abuse of being affected by headache and head pressure; financial abuse of being affected by head pressure; and overall abuse of being affected by headache and head pressure. In general, respondents from Sweden and younger (60–64 years) were less affected by the complaints than those from other countries (e.g. Germany) and older (e.g. 70–74 years), respectively. Respondents on medication (e.g. pain killers) were less affected by all pain complaints and those with high social support by pain in joints or limbs. High scores on anxiety and depression and having many diseases increased the likelihood of being affected by all pain complaints.

Conclusions: Abuse was related with certain pain complaints (e.g. headache), but other factors and in particular mental health and physical diseases impacted on all pain complaints. Medication and partly social support had a positive effect on the pain experience, i.e. the complaints interfered less with for instance the daily-life of the respondents.

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1. Introduction

The world is aging. Demographic projections estimate that the number of persons aged 60 years and more in less developed regions will rise from 510 million in 2011 to 1.613 billion in 2050 and in more developed regions from 274 million to 418 million during the same period. In Europe, it is estimated that the number of persons aged 60 years and more will grow from 164 million in 2011 to 242 million in 2050 [1].

These demographical trends are likely to change the sociodemographic composition of society, and pose major challenges to social and health care systems. The number of cases of conditions such as cancer and diabetes are expected to increase as this population segment grows [2–5]. Demands and costs for social services and health care are also expected to grow [6–8]. For instance, estimations indicate that the public expenditures for Long-Term Care (LTC) for EU/OECD countries may increase at a rate of 1% a year above the growth of the real Gross Domestic Product (GDP) per working member of the population. By 2050 the LTC expenditure parts of the GDP for EU/OECD countries may grow to either 2.2% or 2.7% [6].

Persons aged 60 years and more tend to report pain (e.g. back) at higher rates than younger persons and the oldest old more [9–11]. For instance, Rustøen et al. [11] in a study of pain among 1912 Norwegian citizens aged 18–81 years revealed that 19.2% of the younger age group (18–39 years), 27.5% of the middle-aged group (40–59 years) and 31.2% of the older group (60–81 years) complained of chronic pain (>3-month duration). Almost 59% of the participants with chronic pain had a chronic disease such as osteoarthritis and those in the older age group complained of pain of longer duration and had more comorbidity than those in younger age. However, findings are not consistent across all studies. It has been reported that back-pain declines with age [12]. Hoy et al. [13] revealed that the incidence of low back-pain is highest in the third decade (30–39 years), and overall prevalence increases with age until 60–65 years and then gradually declines. Other authors [14] have reported no prevalence differences in chronic pain between younger and older age

groups. Gender differences remain in most pain problems (e.g. neck or shoulder) in older age, with women complaining more often of pain than men [14,15].

Pain (e.g. back) is an important factor in determining the presence of various disorders and symptoms (e.g. depression, sleep difficulties) in older persons [16,17]. It is also related to decreases in quality of life and ability to socialize, and increased rates of falls and impairments of daily living activities [14,18–20].

Pain (e.g. back) has been associated, for example, with exposure to intimate partner violence (IPV) [21,22]. However, to our knowledge, the association between abuse (e.g. psychological) and pain (e.g. back) has not been addressed among samples of both women and men from the general population aged 60–84 years, although it has been reported that older women (60 years and older) exposed to IPV may be at higher risk for chronic pain than nonabused [23]. The lack of data on the association between elder abuse (e.g. psychological) and pain (e.g. back) is noteworthy in view that both are relatively common (see above on pain), and abuse toward older persons is considered a serious public health issue [24]. A review of 49 studies on the prevalence of elder abuse (e.g. psychological) reported a mean rate of 13% and rates in the general population varied between 3.2% and 27.5%, and any kind of abuse amounts up to 55% [25]. Surveys from Europe, Israel, and the United States [26–28], with general population or community samples revealed abuse rates between 0.6% and 29.7% depending on the type of abuse (e.g. psychological). Differences in prevalence rates between studies are due to the variation in the characteristics of the samples and the operational definition of abuse. Furthermore, studies have reported that elder abuse, not least physical, co-exists with such problems as depression, injury, and reduced social support [29–32]. However, a recent study did not find an independent relationship between the prevalence of psychological abuse and depression [28].

Considering the adverse outcomes of elder abuse (e.g. depression) and other data on the relationship between abuse (e.g. IPV) and pain (e.g. back), it seems plausible that abuse could be a precursor of the experience of pain symptoms

or exacerbate existing symptoms among older persons. As far as we know, there are no data on the influence of different types of abuse (e.g. psychological) and overall abuse (one or more types) on pain symptoms (e.g. back) among older women and men. Based on the abuse topologies as described by the Conflict Tactic Scales 2, CTS2 [33] and the UK study on elder mistreatment [34], an important aim of the present study was to increase the knowledge about different facets of elder abuse and its connection to pain in the elderly. Examining the association between different types of abuse (e.g. psychological), overall abuse (one or more types) and the experience of common pain complaints (e.g. back) may be useful for various reasons. For example, these data may provide valuable information on the role of different types of abuse (e.g. psychological) and overall abuse (one or more types) and their linkages with other factors (e.g. depression) in the experience of pain complaints (e.g. back), which could result in a better understanding of pain complaints and abuse. These data could also be used to implement actions aimed at managing pain complaints, and at preventing abuse and providing help to those who have been abused.

Thus, this study aimed at (i) describing the relationship between the occurrence and nonoccurrence of specific types of abuse (e.g. psychological) and overall abuse (one or more types) during the past 12 months and the experience of 6 common pain complaints (e.g. back) among women and men (60–84 years) from 7 European countries; and (ii) examining, in the same sample, the independent influence of psychological, physical, financial and overall abuse (one or more types) on 6 common pain complaints (e.g. back) while controlling for other variables (e.g. depression).¹

2. Materials and methods

2.1. Sample

The sample consisted of 4467 randomly selected persons aged 60–84 years (2559 women)² enrolled in the cross-sectional survey “Elder Abuse: A Multinational Prevalence Survey, ABUEL” in seven European cities [35].³ The included persons had no cognitive or sensory impairments (e.g. dementia, blindness), were national citizens or documented migrants, lived in own homes, rented homes or homes for elderly, and had proficiency in the native languages. The mean response rate across countries was 45.2%. More details about materials and methods, sampling strategy and data collection, target population, cooperation, completion and response rates by country are reported in Lindert et al. [36].

¹ Too few cases of injury/sexual abuse to separately sustain the regressions. However, these two abuse forms are included in overall abuse.

² Older age starts at 60 years and for several reasons (e.g. availability of sufficient funds) the age upper level was set at 84 years.

³ Represent geographical and cultural diversity across the European Union. Cities have been selected due to for instance the availability of research centers/partners and practical reasons (e.g. availability of sufficient funds).

2.2. Measures

Pain symptoms were assessed with six questions included in the Giessen Complaint List [37]. It contains 24 questions about body complaints (graded 0–4, not affected-very much affected).⁴ The 6 pain complaints within this scale consist of pain in joints or limbs, backache, neck or shoulder pain, headache, heaviness or tiredness in the legs and head pressure. The higher the score in each pain complaint, the more one is affected. Cronbach α for the entire scale across the total population was 0.92 and for the six complaints 0.82.

Abuse was assessed with 52 questions based on the Conflict Tactic Scales 2 (CTS2) [33] and on the UK study of elder abuse/neglect [34]. Psychological abuse consisted of 11 items, of which 6 were severe acts (e.g. threatened to being hit or thrown something at) and 5 minor (e.g. shouted or yelled at); physical abuse 17 items, of which 10 were severe acts (e.g. burned or scalded) and 7 minor (e.g. being grabbed); injury 7 items, of which 4 were severe acts (e.g. passed out from being hit on the head) and 3 minor (e.g. had a sprain, bruise or small cut from being hit); sexual abuse 8 items, of which 5 were severe acts (e.g. had sexual intercourse with you against your will) and 3 minor (e.g. tried to touch you in a sexual way against your will); financial abuse 9 items,⁵ of which 5 were severe acts (e.g. made you give him/them your money, possessions or property against your will) and 4 minor (e.g. attempted to steal money, possessions or property from you). The frequency of abuse acts may have happened once [1], twice [2], 3–5 (midpoint 4), 6–10 (midpoint 8), 11–20 (midpoint 15) or >20 [25] times during the past year (chronicity), did not happen in the past year, but happened before that or never happened. When participants answered that abuse had not happened during the past year, they were considered as no abuse cases (no, 0). If participants answered that they had been abused during the past year, they were considered as abuse cases (yes, 1). The present study focused on the occurrence of different types of abuse (e.g. psychological) and overall abuse (one or more types) during the past 12 months. Cronbach α coefficients across the total population were for psychological abuse 0.85; for physical abuse 0.80; for physical abuse with injury 0.72; for sexual abuse 0.76; and for financial abuse 0.71.

Depression and anxiety were assessed with the Hospital Anxiety and Depression Scale (HADS) [38]. It comprises of 14 questions, of which seven concern depression (e.g. lost interest in appearance) and seven anxiety (e.g. sudden feelings of panic). The total score for depression and anxiety is 21 each, with high scores corresponding to high depression/anxiety levels. Scores 0–7 correspond to no cases, 8–10 to possible cases and 11–21 to probable cases. The present study focused on total scores of depression and anxiety. Cronbach α across the total population was 0.81 for anxiety and 0.80 for depression.

⁴ The extent to which the pain complaints affected for instance daily-life.

⁵ The financial items were based on the UK survey of elder abuse/neglect [34] with 2111 older people from England, Scotland, Wales and Northern Ireland. The sample was weighted to be representative of the general UK population aged 66 and over living in private households.

Social support was assessed with the Multidimensional Scale of Perceived Social Support (MSPSS) [39]. It comprises 12 questions divided in three domains (support from family, significant other and friends) and graded from very strongly disagree [1] to very strongly agree [7]. The score amounts to 12–84. High scores correspond to high social support. The present study focused on the total scores of social support across domains. Cronbach α for the entire scale across the total population was 0.92.

Alcohol consumption was assessed with the question (“How often do you have a drink containing alcohol?”) and 4 response options (once a month or less, 2–4 times a month, 2–3 times a week, 4 or more times a week) derived from the Alcohol Use Disorders Identification Test [40]. The present study focused on whether participants currently used alcohol (“Do you drink alcohol?” with answers “Yes/No”).⁶ Additionally, body mass index (BMI), based on self-reported height and weight, was computed for each person with the formula kg/m^2 .

We assessed the number of diseases (e.g. diabetes), which the participants were presently suffering from. We also assessed the use of pain medication (e.g. analgesics) and of psychoactive agents (e.g. antidepressants) in the format yes/no. The items were derived from the Stockholm County Council health survey [41].

Demographic/socioeconomic characteristics were assessed, and the present study focused on the following variables: country (Greece, Germany, Lithuania, Italy, Portugal, Spain, and Sweden), age (60–64, 65–69, 70–74, 75–79, and 80–94 years), sex (female, male), marital status (single, married/cohabitant, divorced/separated, widow/er), educational level (low, middle, high), occupation (blue-collar, white-collar, housewives/husbands), financial support (work, pension, other income), and financial strain. Financial strain (worries about how to make ends meet) was assessed with one item (no/sometimes/often/always format). A participant was considered to experience financial strain if she/he selected any response other than no. The demographic/socioeconomic variables were tailored for each country, but similar in content.

2.3. Design/procedure

The design was cross-sectional. Recruitment and data gathering in the seven European cities were conducted during January–July 2009 through face-to-face interviews or a combination of interviews/self-response.⁷ All scales (if not available) were translated into the native languages, back-translated, and culturally adapted. The same procedure was used for other materials (e.g. information letters). The participants were informed (in writing/verbally) about the research and informed consent was requested. Confidentiality, anonymity

⁶ Standard glasses of wine and vodka etc.

⁷ The data were first available for processing in 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% for Germany, 0.5% for Greece, 0% for Italy and Spain, 24.8% for Lithuania, 2.3% for Portugal and 63.9% for Sweden. There were no differences between face-to-face and self-response in abuse reporting.

and the participant's rights were emphasized. Ethical permission was applied and received in each country. For further details see Lindert et al. [36].

2.4. Statistical analyses

Bivariate and multivariate analyses of the prevalence of abuse (e.g. psychological) considering various factors (e.g. socioeconomic) and of other areas (e.g. social support), and descriptions of the respondents (e.g. socioeconomic) and of the perpetrators with the present population are shown in previous studies [28,32,42].

Analyses regarding the relationship between different types of abuse (psychological) and overall abuse (one or more types) and the six pain complaints among respondents were performed by means of ANOVAs. The significant level for the present bivariate analyses was set at $P < 0.01$ and for the multivariate analyses at $P < 0.05$.

Moreover, six multiple linear regression analyses, one each for the 6 pain complaints, were conducted. The dependent variables were six pain complaints (pain in joints or limbs, backache, neck or shoulder pain, headache, heaviness or tiredness in the legs and head pressure). The independent variables⁸ were selected based on statistical inference, i.e. factors (e.g. socioeconomic) that differentiated respondents in previous analyses [43–45]. The independent variables were country, age, sex, marital status, education, occupation, financial support, financial strain, cigarette and alcohol use, BMI, depression and anxiety, number of diseases, medication and social support (see measures). We also added psychological, physical, financial and overall abuse (one or more types). As injury and sexual abuse separately were not suitable to the regression model (e.g. too few cases) of the pain complaints, they were not included separately. However, overall abuse (one or more types) includes these abuse types.

The associations between the independent and dependent variables were expressed as standardized betas (β), confidence intervals (CI 95%) and R^2 (goodness of fit of the models). Analyses were carried out using the SPSS statistical package 20 [46].

3. Results

3.1. Abuse and pain complaints

As shown in Table 1, psychologically abused respondents contrasted to non-abused were more affected by all pain complaints; physically abused by headache and head pressure; sexually abused by neck or shoulder pain and headache; injured by all complaints (except pain in joints or limbs); financially abused by pain in joints or limbs and head pressure; and overall abuse (one or more types) by all complaints (except headache). Thus, the relationship between abuse and pain

⁸ A number of interactions (e.g. country/abuse) as independent variables were tested, but abandoned as we in several cases explained a significant amount of the variance of the dependent variables, but many of the regression coefficients were not significantly different from zero.

Table 1 – Relationships between different abuse types/any abuse and 6× Pain complaints (joints or limbs, backache, headache, neck/shoulder, heaviness or tiredness in the legs, head pressure) among all respondents.

Variable	Pain in joints or limbs n = 4467	Backache n = 4467	Headache n = 4467
Psychological abuse	F[1,4465] = 27.42, P < 0.0001 ^a	F[1,4465] = 47.97, P < 0.0001	F[1,4465] = 10.15, P < 0.001
Yes (n = 883)	2.86 (1.44)	2.66 (1.41)	1.87 (1.16)
No (n = 3584)	2.59 (1.40)	2.29 (1.39)	1.74 (1.05)
Physical abuse	NS ^b	NS	F[1,4465] = 10.85, P < 0.001
Yes (n = 117)	2.77 (1.44)	2.59 (1.38)	2.09 (1.34)
No (n = 4350)	2.64 (1.41)	2.36 (1.40)	1.75 (1.07)
Sexual abuse	NS	NS	F[1,4465] = 13.64, P < 0.0001
Yes (n = 34)	3.06 (1.37)	2.88 (1.32)	2.44 (1.42)
No (4433)	2.64 (1.41)	2.36 (1.40)	1.76 (1.07)
Injury	NS	F[1,4465] = 12.66, P < 0.0001	F[1,4465] = 35.26, P < 0.0001
Yes (n = 31)	3.23 (1.54)	3.26 (1.39)	2.90 (1.42)
No (n = 4436)	2.64 (1.41)	2.36 (1.40)	1.75 (1.07)
Financial abuse	F[1,4465] = 9.66, P = 0.002	NS	NS
Yes (n = 175)	2.97 (1.48)	2.51 (1.47)	1.82 (1.23)
No (4292)	2.63 (1.41)	2.36 (1.40)	1.76 (1.07)
Overall abuse ^c	F[1,4465] = 28.08, P < 0.0001	F[1,4465] = 40.77, P < 0.0001	NS
Yes (n = 1009)	2.85 (1.43)	2.61 (1.42)	1.84 (1.15)
No (n = 3458)	2.58 (1.40)	2.29 (1.39)	1.74 (1.05)
Variable	Neck or shoulder n = 4467	Heaviness or tiredness in the legs n = 4467	Head pressure n = 4467
Psychological abuse	F[1,4465] = 41.83, P < 0.0001	F[1,4465] = 20.01, P < 0.0001	F[1,4465] = 15.48, P < 0.0001
Yes (n = 883)	2.50 (1.41)	2.31 (1.38)	1.53 (1.03)
No (n = 3584)	2.24 (1.35)	2.09 (1.32)	1.40 (0.87)
Physical abuse	NS	NS	F[6,4465] = 11.76, P < 0.001
Yes (n = 117)	2.41 (1.42)	2.42 (1.46)	1.71 (1.19)
No (n = 4350)	2.23 (1.37)	2.12 (1.33)	1.42 (0.90)
Sexual abuse	F[1,4465] = 14.15, P < 0.0001	NS	NS
Yes (n = 34)	3.12 (1.41)	2.53 (1.35)	1.76 (1.23)
No (4433)	2.23 (1.37)	2.13 (1.34)	1.42 (0.90)
Injury	F[1,4465] = 22.06, P < 0.0001	F[1,4465] = 16.34, P < 0.0001	F[1,4465] = 22.46, P < 0.0001
Yes (n = 31)	3.39 (1.31)	3.10 (1.53)	2.19 (1.49)
No (n = 4436)	2.23 (1.37)	2.12 (1.33)	1.42 (0.90)
Financial abuse	NS	NS	F[1,4465] = 10.71, P < 0.001
Yes (n = 175)	2.47 (1.47)	2.34 (1.46)	1.65 (1.18)
No (4292)	2.23 (1.37)	2.12 (1.33)	1.42 (0.89)
Overall abuse ^c	F[1,4465] = 37.26, P < 0.0001	F[1,4465] = 16.23, P < 0.0001	F[1,4465] = 11.84, P < 0.001
Yes (n = 1009)	2.47 (1.41)	2.28 (1.38)	1.51 (1.03)
No (n = 3458)	2.17 (1.35)	2.09 (1.32)	1.40 (0.87)

Values are mean (standard deviation).
^a All cases, ANOVAs.
^b All cases, not significant.
^c One or more types.

complaints was particularly evident regarding psychological abuse, injury and overall abuse (one or more types).

3.2. Factors associated with pain complaints

Pain in Joints or Limbs. As shown in Table 2, contrasted to respondents from the reference country (Sweden), those from Germany, Italy, Portugal and Spain were more affected by pain in joints or limbs. Similar findings were found concerning all age groups contrasted to the reference group (60–64 years),

blue-collar workers to white-collar, experiencing financial strain, having high BMI, scoring high in anxiety and depression and suffering from many physical ailments (e.g. diabetes). Being from Greece and being a man, using pain medication (e.g. analgesics) and psychoactive agents (e.g. antidepressants), and scoring high on social support were associated with a lower likelihood of being much affected by pain in joints or limbs. The model explained 32.2% of the variance in pain in joints or limbs.

Backache. Contrasted to the respondents from the reference country (Sweden), those from Germany, Italy, Lithuania,

Table 2a – Multiple linear regression analyses of the association between demographics/socio-economics, life-style, health indicators, psychological, physical, financial and any abuse, social support and pain/musculoskeletal symptoms (pain in joints or limbs, backache, headache, neck or shoulder pain, heaviness or tiredness in the legs, head pressure).

Independent variables	Pain in joints or limbs		Backache		Headache	
	β	95% CI	β	95% CI	β	95% CI
Country ^a						
Germany	0.072 ^{****}	0.171; 0.472	0.118 ^{****}	0.375; 0.684	0.050 ^{**}	0.049; 0.293
Greece	-0.097 ^{****}	-0.543; -0.218	-0.159 ^{****}	-0.790; -0.456	0.097 ^{****}	0.159; 0.423
Italy	0.065 ^{****}	0.118; 0.410	0.038 [*]	0.001; 0.302	-0.048 [*]	-0.266; -0.028
Lithuania	0.005	-0.132; 0.171	0.048 [*]	0.030; 0.340	0.016	-0.074; 0.171
Portugal	0.102 ^{****}	0.260; 0.550	0.071 ^{****}	0.131; 0.428	0.065 ^{****}	0.077; 0.313
Spain	0.116 ^{****}	0.302; 0.614	0.170 ^{****}	0.510; 0.831	0.084 ^{****}	0.127; 0.380
Sweden ^b						
Age ^a						
65-69	0.047 ^{**}	0.043; 0.262	0.019	-0.051; 0.174	-0.025	-0.151; 0.026
70-74	0.069 ^{****}	0.120; 0.356	0.038 [*]	0.009; 0.251	-0.056 ^{**}	-0.241; -0.049
75-79	0.099 ^{****}	0.248; 0.504	0.048 ^{**}	0.049; 0.311	-0.065 ^{****}	-0.292; -0.085
80-84	0.095 ^{****}	0.268; 0.554	0.041 [*]	0.030; 0.324	-0.083 ^{****}	-0.387; -0.156
60-64 ^b						
Sex ^a						
Male	-0.116 ^{****}	-0.418; -0.242	-0.085 ^{****}	-0.333; -0.152	-0.073 ^{****}	-0.230; -0.087
Female ^b						
Marital status ^a						
Married-cohabitant	0.012	-0.128; 0.200	0.036	-0.062; 0.274	0.026	-0.014; 0.125
Divorced-separated	-0.011	-0.261; 0.142	0.030	-0.049; 0.365	0.029	-0.731; 0.186
Widow(er)	0.026	-0.087; 0.266	0.039	-0.047; 0.316	0.022	-0.449; 0.153
Single ^b						
Educational level ^a						
Low ^d	0.012	-0.075; 0.146	0.027	-0.036; 0.192	0.046 [*]	0.011; 0.191
Middle ^e	0.010	-0.070; 0.127	0.037 [*]	0.004; 0.206	-0.028	-0.141; 0.018
High ^{b,f}						
Occupation ^a						
Blue-collar worker	0.038 [*]	0.021; 0.214	0.047 ^{**}	0.048; 0.245	-0.003	-0.085; 0.071
Housewives-husbands	0.006	-0.126; 0.170	0.012	-0.104; 0.201	-0.004	-0.133; 0.108
White-collar worker ^b						
Financial support ^a						
Pension	-0.014	-0.172; 0.088	-0.021	-0.196; 0.071	0.021	-0.059; 0.152
Other income ^g	0.045	-0.008; 0.317	0.053 [*]	0.013; 0.346	0.013	-0.097; 0.166
Work ^b						
Financial strain ^a						
Yes	0.045 ^{**}	0.050; 0.217	0.035 [*]	0.016; 0.188	0.024	-0.014; 0.123
No ^b						
Smoking ^a						
Yes	-0.013	-0.169; 0.061	0.010	-0.075; 0.161	0.028	-0.003; 0.184
No ^b						
Alcohol consumption ^a						
Yes	0.011	-0.056; 0.118	-0.001	-0.092; 0.087	-0.009	-0.090; 0.051
No ^b						
BMI ^c	0.100 ^{****}	0.025; 0.043	0.038 ^{**}	0.004; 0.022	0.009	-0.005; 0.010
Anxiety ^c	0.108 ^{****}	0.026; 0.050	0.094 ^{****}	0.021; 0.045	0.161 ^{****}	0.033; 0.053
Depression ^c	0.045 [*]	0.003; 0.028	0.077 ^{****}	0.014; 0.040	0.084 ^{****}	0.012; 0.032
Physical diseases ^{c,h}	0.200 ^{****}	0.169; 0.226	0.160 ^{****}	0.129; 0.187	0.102 ^{****}	0.054; 0.100
Pain medication ^{a,i}						
Yes	-0.190 ^{****}	-0.638; -0.473	-0.193 ^{****}	-0.647; -0.479	-0.151 ^{****}	-0.403; -0.270
No ^b						
Psychoactive agents ^{a,j}						
Yes	-0.045 ^{**}	-0.232; -0.050	-0.028	-0.182; 0.005	-0.083 ^{****}	-0.271; -0.123
No ^b						
Psychological abuse ^a						
Yes	0.036	-0.157; 0.413	0.066	-0.060; 0.524	0.081	-0.012; 0.450

Table 2a (Continued)

Independent variables	Pain in joints or limbs		Backache		Headache	
	β	95% CI	β	95% CI	β	95% CI
No ^b						
Physical abuse ^a						
Yes	0.004	-0.210; 0.284	0.015	-0.115; 0.392	0.042 ^{**}	0.089; 0.490
No ^b						
Financial abuse ^a						
Yes	0.001	-0.248; 0.246	-0.023	-0.423; 0.084	0.008	-0.158; 0.243
No ^b						
Overall abuse ^{a,k}						
Yes	0.012	-0.254; 0.334	-0.001	-0.304; 0.299	0.039 [*]	0.087; 0.488
No ^b						
Social support ^c	-0.029 [*]	-0.006; 0.000	-0.027	-0.006; 0.000	-0.030	-0.005; 0.000
R ²	32.2		28.4		23	

^a Categorical variables.

^b Reference.

^c Continuous variables.

^d Less than primary school/primary school/similar.

^e Secondary school/similar.

^f University/similar.

^g e.g. Spouses/partner income.

^h Number of diseases, e.g. asthma.

ⁱ e.g. Analgesics.

^j e.g. Anti-depressives.

^k One or more types.

^{*} P < 0.05.

^{**} P < 0.01.

^{***} P < 0.001.

^{****} P < 0.0001.

Portugal, and Spain were more affected by backache. Similar findings were found concerning the age groups 70–74, 75–79 and 80–84 contrasted to the reference group (60–64 years), blue-collar workers to white-collar, middle education to high, other income to work, experiencing financial strain, having high BMI, scoring high in anxiety and depression and suffering from many physical ailments (e.g. diabetes). Being from Greece and being a man, and using pain medication (e.g. analgesics) were associated with a lower likelihood of being much affected by backache. The model explained 28.4% of the variance in backache.

Headache. Contrasted to the respondents from the reference country (Sweden), those from Germany, Greece, Portugal and Spain were more affected by headache. Similar findings were found concerning low education to high, scoring high in anxiety and depression, suffering from many physical ailments (e.g. diabetes) and exposure to physical and overall abuse (one or more types). Being from Italy, a man, and aged 70–74/75–79/80–84 years, and using of pain medication (e.g. analgesics) and psychoactive agents (e.g. antidepressants) were associated with a lower likelihood of being much affected by headache. The model explained 23% of the variance in headache.

Neck or Shoulder Pain. Contrasted to the respondents from the reference country (Sweden), those from Germany, Italy, Portugal and Spain were more affected by neck or shoulder pain. Similar findings were found concerning low education to high, experiencing financial strain, scoring high in anxiety and

depression and suffering from many physical ailments (e.g. diabetes). Being a man and using pain medications (e.g. analgesics) and psychoactive agents (e.g. antidepressants) were associated with a lower likelihood of being much affected by neck or shoulder pain. The model explained 24.5% of the variance in neck or shoulder pain.

Head Pressure. Contrasted to the respondents from the reference country (Sweden), those from Germany, Greece, Lithuania and Portugal were more affected by head pressure. Similar findings were found concerning low education to high, scoring high in anxiety and depression, suffering from many physical ailments (e.g. diabetes) and being exposed to psychological, physical, financial and overall abuse (one or more types). Being a man and using pain medication (e.g. analgesics) and psychoactive agents (e.g. antidepressants) were associated with a lower likelihood of being much affected by head pressure. The model explained 18.2% of the variance in head pressure.

Heaviness or Tiredness in the Legs. Contrasted to the respondents from the reference country (Sweden), those from Lithuania, Portugal and Spain were more affected by heaviness or tiredness in the legs. Similar findings were found concerning the age groups 70–74, 75–79 and 80–84 years contrasted to the reference group (60–64 years), blue-collar worker to white-collar, scoring high in anxiety and depression, suffering from many physical ailments (e.g. diabetes) and being exposed to psychological abuse. Being a man and using pain medication (e.g. analgesics) and psychoactive agents (e.g. antidepressants) were associated with a lower likelihood of being much affected

Table 2b – Multiple linear regression analyses of the association between demographics/socioeconomics, life-style, health indicators, psychological, physical, financial and any abuse, social support and pain/musculoskeletal symptoms (pain in joints or limbs, backache, headache, neck or shoulder pain, heaviness or tiredness in the legs, head pressure).

Independent variables	Head pressure		Heaviness or tiredness in the legs		Neck or shoulder	
	β	95% CI	β	95% CI	β	95% CI
Country ^a						
Germany	0.055**	0.052; 0.264	0.011	-0.096; 0.190	0.092****	0.250; 0.558
Greece	0.090****	0.112; 0.342	0.024	-0.064; 0.246	-0.021	-0.247; 0.087
Italy	0.016	-0.062; 0.145	0.035	-0.005; 0.274	0.057**	0.073; 0.373
Lithuania	0.055 [†]	0.030; 0.243	0.096****	0.211; 0.500	-0.017	-0.221; 0.090
Portugal	0.062**	0.055; 0.259	0.081****	0.165; 0.442	0.075****	0.140; 0.438
Spain	0.032	-0.030; 0.191	0.103****	0.236; 0.534	0.151****	0.421; 0.742
Sweden ^b						
Age ^a						
65-69	0.000	-0.078; 0.077	0.028	-0.019; 0.190	-0.018	-0.170; 0.055
70-74	-0.035	-0.160; 0.006	0.050**	0.050; 0.274	-0.025	-0.205; 0.037
75-79	-0.014	-0.124; 0.056	0.079****	0.161; 0.404	0.011	-0.090; 0.172
80-84	-0.035	-0.199; 0.003	0.109****	0.310; 0.583	-0.015	-0.211; 0.083
60-64 ^b						
Sex ^a						
Male	-0.052**	-0.157; -0.033	-0.093****	-0.335; 0.167	-0.082****	-0.317; -0.136
Female ^b						
Marital status ^a						
Married-cohabitant	0.016	-0.085; 0.146	0.044	-0.033; 0.279	0.017	-0.118; 0.218
Divorced-separated	0.035	-0.051; 0.201	0.032	-0.031; 0.353	0.003	-0.194; 0.220
Widow(er)	0.034	-0.050; 0.199	0.048	-0.012; 0.324	0.035	-0.066; 0.297
Single ^b						
Educational level ^a						
Low ^d	0.065**	0.043; 0.200	0.012	-0.073; 0.138	0.079****	0.109; 0.337
Middle ^e	-0.002	-0.074; 0.065	0.002	-0.089; 0.099	0.012	-0.066; 0.136
High ^{b,f}						
Occupation ^a						
Blue-collar worker	0.002	-0.064; 0.072	0.076****	0.132; 0.316	0.028	-0.013; 0.184
Housewives-husbands	-0.031	-0.183; 0.026	0.030	-0.030; 0.253	-0.008	-0.182; 0.122
White-collar worker ^b						
Financial support ^a						
Pension	-0.008	-0.108; 0.076	-0.027	-0.200; 0.048	-0.009	-0.158; 0.109
Other income ^g	0.016	-0.079; 0.150	0.009	-0.126; 0.183	0.045	-0.097; 0.314
Work ^b						
Financial strain ^a						
Yes	0.017	-0.026; 0.092	0.017	-0.031; 0.128	0.032 [†]	0.005; 0.178
No ^b						
Smoking ^a						
Yes	-0.006	-0.098; 0.064	0.005	-0.087; 0.132	-0.025	-0.223; 0.013
No ^b						
Alcohol consumption ^a						
Yes	0.009	-0.044; 0.079	-0.004	-0.095; 0.071	0.011	-0.059; 0.120
No ^b						
BMI ^c	0.015	-0.003; 0.010	0.089****	0.040; 0.058	0.002	-0.009; 0.010
Anxiety ^c	0.140****	0.023; 0.040	0.157****	0.018; 0.041	0.154****	0.040; 0.065
Depression ^c	0.086****	0.010; 0.028	0.168****	0.040; 0.064	0.047 [†]	0.003; 0.029
Physical diseases ^{c,h}	0.126****	0.060; 0.100	0.160****	0.131; 0.184	0.173****	0.138; 0.196
Pain medication ^{a,i}						
Yes	-0.043**	-0.138; -0.022	-0.095****	-0.340; -0.184	-0.135****	-0.468; -0.299
No ^b						
Psychoactive agents ^{a,j}						
Yes	-0.133****	-0.330; -0.201	-0.057****	-0.255; -0.081	-0.054**	-0.257; -0.070
No ^b						
Psychological abuse ^a						

Table 2b (Continued)

Independent variables	Head pressure		Heaviness or tiredness in the legs		Neck or shoulder	
	β	95% CI	β	95% CI	β	95% CI
Yes No ^b	0.149 ^{***}	0.138; 0.541	0.080 [*]	-0.001; 0.541	0.068	-0.059; 0.525
Physical abuse ^a Yes No ^b	0.035 ⁺	0.028; 0.377	0.016	-0.097; 0.373	0.006	-0.200; 0.307
Financial abuse ^a Yes No ^b	0.048 ⁺	0.051; 0.400	-0.005	-0.272; 0.198	0.001	-0.251; 0.255
Overall abuse ^{a,k} Yes No ^b	0.159 ^{***}	0.140; 0.552	-0.055	-0.455; 0.104	-0.013	-0.343; 0.260
Social support ^c R ²	-0.024 18.2	-0.003; 0.001	-0.019 31.7	-0.004; 0.001	-0.028 24.5	-0.006; 0.000

^a Categorical variables.
^b Reference.
^c Continuous variables.
^d Less than primary school/primary school/similar.
^e Secondary school/similar.
^f University/similar.
^g e.g. Spouses/partner income.
^h Number of diseases, e.g. asthma.
ⁱ e.g. Analgesics.
^j e.g. Anti-depressives.
^k One or more types.
^{*} P < 0.05.
^{**} P < 0.01.
^{***} P < 0.001.
^{****} P < 0.0001.

by heaviness or tiredness in the legs. The model explained 31.7% of the variance in heaviness or tiredness in the legs.

4. Discussion

4.1. Abuse and pain complaints

Psychological abuse was linked to all complaints; overall abuse (one or more types) to all complaints (except headache); injury to all complaints (except pain in joints or limbs); physical abuse to headache and head pressure; sexual abuse to neck or shoulder pain and headache, and financial abuse to pain in joints or limbs and head pressure.

The regressions revealed, however, that abuse was only independently associated with headache, head pressure and heaviness or tiredness in the legs. Thus, respondents exposed to psychological abuse were more likely to be affected by head pressure and heaviness or tiredness in the legs, exposed to physical abuse by headache and head pressure, exposed to financial abuse by head pressure, and exposed to overall abuse (one or more types) by headache and head pressure. This apparently in line with previous studies showing an association between IPV mainly against women and somatic problems, e.g. pain (21–23). However, in our case abuse was connected to head problems (e.g. headache) or heaviness or tiredness in the legs, and not necessarily with IPV.

Being exposed to abuse (e.g. psychological), particularly when the perpetrators were commonly spouses/partners and other relatives (e.g. grandchildren),⁹ may have led to emotional distress in terms of for instance feelings of hopelessness, helplessness and diminished self-esteem [31,47,48], resulting over time in the experience of pain (e.g. headache). Previous data suggest a connection between some of these factors and pain in various samples, although not necessarily in conjunction with abuse [49–53]. However, in view of the cross-sectional nature of our data, an inverse relation may be possible. The complaints (e.g. headache) experienced by the respondents could have been a too greater burden (e.g. stress, irritation) for spouses/partners and other relatives (e.g. grandchildren), resulting in abuse. Previous observations indicate that dependency because of physical and cognitive problems [35] may contribute to the occurrence of abuse.

4.2. Demographic/socioeconomic characteristics, life style and pain complaints

With the exception of Greece regarding pain in joints or limbs and backache and Italy regarding headache, Sweden was less affected by the pain complaints than the other countries.

⁹ Psychological, 70%; physical 54%; financial, 25.2%; and any abuse, 65%. For more detailed data see for instance [28,35].

Pain is common among older persons [9–11], although it has been reported no differences between older and younger persons [14]. There is a scarcity of studies across countries and cultures, but a relatively recent study across 16 European countries [14] showed prevalence rates of chronic pain ranging from 12% to 30%, with the lowest in Spain (12%) and the highest in Norway (30%).¹⁰ There are also limited data on the impact of pain across European countries, but Breivik et al. [14] reported variation between countries. For instance, respondents in Sweden experienced their pain as less severe than those in Germany, Italy and Spain, the experienced impact of pain on emotional status (depression) was greater in Spain than in Sweden, and respondents in Italy and Spain had seen a pain management specialist more often than those in Sweden. On the other hand, respondents in Sweden were more often involved in different treatments (e.g. acupuncture) than those in Germany, Italy and Spain. Thus, our findings concerning Sweden could reflect the variation in the impact of the complaints at various levels (e.g. mental health) and the availability of treatment. However, these issues were not addressed here.

In general, the older age groups (70–74 years) were more affected by pain in joints or limbs, backache and heaviness or tiredness in the legs than the youngest (60–64 years), and the contrary concerning headache. Our findings are in accordance with previous data indicating that older persons tend to report more pain complaints (e.g. pain in joints or limbs) than younger [9–11], although no differences between younger and older persons has been reported [14]. As to headache, our data confirm previous observations of lower prevalence rates among older persons than younger and that headache problems decline with age [54,55]. Our study did not address the reasons why the oldest old were more affected by the abovementioned complaints (e.g. pain in joints or limbs) than the younger, but one could hypothesize that this may be due to complex interactions between biological, psychological, cultural and socioeconomic factors whose clarification is beyond our aims.

Women were more affected by all pain complaints than men. Our findings corroborate previous reports that pain (most types) in older age is more prevalent among women than among men, and that women experience pain as more disabling [14,15,56,57]. We did not address the factors behind the gender differences. However, as suggested by several authors [58,59], sex differences in pain may be due to complex interactions between biological, psychological, as well as social and cultural factors

Contrasted to high educated respondents, those with low education were more affected by headache, head pressure and neck or shoulder pain, and those with middle education by backache. Our results are generally in accord with previous data revealing that persons with high education fare better health-wise, including pain, than less educated persons [60–62]. On the other hand, other studies indicate that the importance of education for health decreases in older age [63] and the education-health relationship in older adults is mediated by psychological, social and economic factors [64].

Respondents with a blue-collar occupational position contrasted to white-collar¹¹ were more affected by pain in joints or limbs and backache. One could hypothesize that these respondents were exposed to prolonged and repeated harmful biomechanical loads, e.g. lifting, carrying, prolonged restricted position [43] during their career leading to such pain complaints, which remained after stopping work or still on work. In any case, our findings are in accord with various studies showing an association between blue-collar work and pain in joints or limbs and backache [65,66].

Respondents financially supported by other income (e.g. spouses/partners income) were more affected by backache. Dependency on others (e.g. spouses/partners) for daily living may be a sign of low socioeconomic status. Persons living in poor socioeconomic conditions tend to show higher morbidity across many conditions (including pain), experience more stressful life events and are exposed to more environmental stressors [44,67–69], and have fewer psychosocial resources to cope with stressful events and experiences [70]. However, findings on the association between low socioeconomic status, older age, health and mortality may be inconsistent. For instance, some authors have reported that socioeconomic differences in morbidity decrease as individuals get older [71], while others suggest they continue into old age [72]. In any case, our findings indicate that personal economic resources are important for health.

Respondents who experienced financial strain were more affected by pain in joints or limbs, backache and headache. Evidence suggests that financial strain indirectly or directly contributes to poor health, e.g. pain [73] and mortality at least in women [74]. Strained financial resources may have decreased control or lack of control over important aspects of life (e.g. ability to fulfill needs necessary to maintain well-being), and this over time could have resulted in stress and negative emotions and thereafter in poor health (e.g. pain). On the other hand, due to the cross-sectional character of our data, an inverse relation is also possible. Persons with poor health (e.g. bodily pains) are more likely to be on different types of benefits (e.g. sick-leave), which are often a sign of economic strain [75,76].

Respondents with high BMI were more affected by pain in joints or limbs and backache. Our findings seem to be in line with various studies showing a relation between high BMI and these complaints [77,78]. However, the mechanisms underlying the relation between high BMI and these complaints were not addressed here

4.3. Health variables, medication and pain complaints

Respondents who scored high in anxiety and depression were more affected by all pain complaints. The co-morbidity between depression, anxiety and somatic complaints (e.g. pain in joints) appears to be established in various samples, including older persons [45,49–51]. For example, somatic complaints (e.g. aches) are included in the diagnostic features of depression and anxiety, which may explain the high rates of somatic complaints in patients with these conditions [51]. Somatic complaints may be the prominent presentation of depressive and anxiety symptoms [79,80], psychological

¹⁰ Of the countries in our survey, only Germany, Italy, Spain and Sweden were included in the study of Breivik and colleagues [28].

¹¹ Previously or presently.

distress (e.g. depression) may be expressed through somatic complaints [45] and reduced physical functioning often accompanies depression and anxiety [81]. Further, persons with depression or anxiety may have lower thresholds for experiencing somatic symptoms, resulting in a higher degree of symptom reporting in these conditions [82]. Patients with severe depression report more somatic complaints than patients with mild depression, suggesting a close connection between the level of depression and the reporting of somatic complaints [83]. On the other hand, in view of the cross-sectional nature of our data, a reverse pattern may be possible. The high scores in depression and anxiety could be the result of, at least partly, the pain complaints experienced by the respondents as reported by other studies [52,84-86].

Respondents who suffered from many physical diseases (e.g. diabetes) were more affected by all pain complaints. This connection may pertain, at least partly, to that the complaints reported by older persons have similarities to those of the diseases they suffer from. In fact, the physical diseases reported by our respondents are similar to those shown in various studies [2-4], and in this context the connection between physical diseases and pain complaints may be an expected finding

Except for backache, using psychoactive agents (e.g. antidepressants) were associated with a decreased likelihood of being affected by all pain complaints and using pain medication (e.g. analgesics) by all complaints. This may be a reflection that respondents were on treatment for their complaints and/or for the diseases they suffer from whose symptoms have similarities with the complaints. Various studies have observed that older persons are high users of health care, including for the present complaints [76,87,88].

4.4. Social support and pain complaints

Scoring high on social support was associated with a reduced likelihood of being affected by pain in joints or limbs. Although old age is associated with decreased social networks and low social support, social support is important for older persons who frequently rely on family and others (e.g. friends) to assist them with daily activities, provide companionship and affection, and could be the main source of personal care and well-being [89-91]. Previous findings indicate that social support has a positive effect on the older person's physical (including pain) and mental health, quality of life and survival, which may be achieved by that social support strengthens for instance the older person's coping and recovery when ill or by biological processes that protect against illness [90,92-95]. Thus, our results concerning the "protective" effect of social support on pain in joints or limbs seem to be in line with studies from different areas.

5. Limitations

This study has several limitations that need to be acknowledged. First, the cross-sectional data does not permit to draw firm conclusions about the direction of causality, which would require another design type (e.g. longitudinal repeated-measures design). Second, the enlisted respondents lived in urban centers from seven specific European countries, and may not be representative for persons from nonurban areas, other countries

in Europe and elsewhere (e.g. the United States). Accordingly, the generalizability of our findings cannot be guaranteed. Third, the collected information was dependent on the respondents' subjective assessments of their situation, and was not validated with objective measures. For instance, the presence of the pain complaints (e.g. backache) was not objectively confirmed. Thus, the findings should be interpreted cautiously. Fourth, refusal rates varied greatly between cities and the total refusal was high, which could have resulted in 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). In spite of these weaknesses and limitations, the current study confirmed previous results and may have provided new insights into the experience of pain complaints, and its connection to abuse (e.g. psychological) considering other factors (e.g. depression).

6. Conclusions

Abuse influenced the experience of certain pain complaints (e.g. headache), but other factors, and in particular anxiety, depression and presence of diseases had a more general impact. Respondents from Sweden were less affected than those of the other countries. Respondents on medication were less affected by the pain complaints and partly also those with high social support. Overall, our findings suggest that many older persons are exposed to several burdens, which are likely to cause great suffering. The pain complaints, abuse and other related factors (e.g. anxiety) call for urgent actions in terms of information campaigns, and prevention and treatment interventions from among others social and health care planners/providers. Society at large must be thoroughly informed about the situation of elder persons. Particular attention should be paid to the burden of abuse which must be alleviated, and protection must be given to avoid further abuse among those who have been victimized and those at risk must be identified. The importance of social support for the well-being of older persons should not be underestimated. In this context, our results may be useful for social and health care planners/providers in their work to improve the situation of abused older persons and their well-being in Europe. Furthermore, social and health care staff must be trained to probe for elder abuse as part of their screening of older persons that visit their services of other reasons (e.g. pain), and when abuse is present refer the older persons to proper sites. Notwithstanding, more research into the relationship between abuse and pain complaints is warranted, particularly longitudinal.

Conflict of interest

The authors state no conflict of interest.

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