Association Between Pain and Depression Among Older Adults in Europe: Results From the Aged in Home Care (AdHOC) Project: A Cross-Sectional Study

Graziano Onder, M.D., Ph.D.; Francesco Landi, M.D., Ph.D.; Giovanni Gambassi, M.D.; Rosa Liperoti, M.D., M.P.H.; Manuel Soldato, M.D.; Chiara Catananti, M.D.; Harriet Finne-Soveri, M.D.; Cornelius Katona, M.D.; Iain Carpenter, M.D.; and Roberto Bernabei, M.D.

Objective: To assess the association between pain and depression in a population of older adults.

Method: We conducted a cross-sectional study using data from the Aged in Home Care (AdHOC) database, which contains information on older adults receiving home care services in 11 European countries from 2001 to 2003. Pain was defined as any type of pain or discomfort manifested over the 7 days preceding the assessment. Depression was defined as a score ≥ 3 on the Minimum Data Set Depression Rating Scale.

Results: Mean age of 3976 subjects entering the study was 82.3 years, and 2948 (74.1%) were women. Of the total sample, 2380 subjects presented with pain (59.9%), but its prevalence differed substantially among countries. Depression was diagnosed in 181 (11.3%) of the 1596 participants without pain and in 464 (19.5%) of the 2380 participants with pain ($p < .001$). After adjusting for potential confounders, pain was significantly associated with depression (odds ratio [OR] 1.76, 95% confidence interval [CI] = 1.43 to 2.17). This association seemed to be modified by sex. Compared to male participants without pain, women with pain were significantly more likely to present with depression (OR = 1.77; 95% CI = 1.29 to 2.42), while no significant difference was observed for women without pain (OR = 0.86; 95% CI = 0.61 to 1.22) and men with pain (OR = 1.24; 95% CI = 0.86 to 1.79). Among women, the association of pain and depression became progressively more pronounced as pain severity, pain frequency, and number of painful sites increased.

Conclusion: This study documented that in a large sample of older adults living in the community, pain is associated with depression, especially among women.

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Received Aug. 30, 2004; accepted Jan. 20, 2005. *From the Dipartimento di Scienze Gerontologiche, Università Cattolica del Sacro Cuore (Department of Gerontologic Science, Catholic University of the Sacred Heart), Rome, Italy (Drs. Onder, Landi, Gambassi, Liperoti, Soldato, Catananti, and Bernabei); Department of Community Health, Brown University Medical School, Providence, R.I. (Dr. Gambassi); National Research and Development Center for Welfare and Health (Center for Health Economics), Helsinki, Finland (Dr. Finne-Soveri); Department of Psychiatry and Behavioural Sciences, Royal Free and University College Medical School, London, U.K. (Dr. Katona); and Centre for Health Services Studies, University of Kent, Canterbury, U.K. (Dr. Carpenter).*

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Corresponding author and reprints: Graziano Onder, M.D., Ph.D., Centro Medicina dell'Invecchiamento, Università Cattolica del Sacro Cuore, Policlinico A. Gemelli, L.go Francesco Vito 1, 00168 Roma, Italy (e-mail: graziano_onder@rm.unicatt.it).

Depression in the older population is a major health issue because of both its high prevalence and its adverse heath consequences. About 12% to 20% of community-dwelling older persons suffer from symptoms of depression.[1,2] Depressive symptoms have been associated with adverse outcomes, including increased risk of morbidity and mortality, poorer health status, higher prevalence of disability, and more severe comorbidity.[3–7]

Typically, subjects with depression present with a complex set of overlapping symptoms, including emotional and physical problems, and frequently complain about pain symptoms: on average, 65% of subjects with depression have clinically significant pain, with little apparent variation across settings.[8] This association, defined as the *depression-pain syndrome* or *depression-pain dyad*, is responsible for elevated health care costs and high rates of disability, but it is not always recognized, and subjects with depression are more likely to receive inaccurate pain assessment.[9,10]

In addition, understanding the interaction between pain and depression is critical, owing to the fact that physicians

frequently fail to accurately diagnose and treat pain. In particular, older adults with pain are more likely to receive inadequate pharmacologic treatment: independent of clinical setting and clinical diagnosis, one quarter of older adults with pain do not receive any analgesic drugs, and those older than 85 years are even less likely to receive any treatment.[11–13]

These considerations, along with the emphasis on pain as the fifth vital sign by the Joint Commission on Accreditation of Healthcare Organizations,[14] highlight the importance of a better understanding of the link between depression and pain. Therefore, the aim of the present cross-sectional study was to assess the association between pain and depression in a population of older adults receiving home care services in 11 European countries.

METHOD

Study Population

The study population consisted of a random sample of older adults admitted to the home care programs in 11 European countries who participated in the Aged in Home Care (AdHOC) project from 2001 to 2003. The AdHOC project aimed to compare models of home care for the elderly through the analysis of the structural and organizational characteristics of home care services in 11 European countries, along with the clinical and functional characteristics of their clients. As described elsewhere,[15] at each site, the sample was obtained by a computer-driven randomization of all subjects aged 65 years or more already receiving home care services. When specific services (e.g., "integrated" or "social" only) were provided by different agencies, the sample reflected the overall proportion of older adults receiving the services of interest. Specifically, subjects in home care were enrolled in the following areas: Prague (Czech Republic, N = 428), Copenhagen (Denmark, N = 469), Helsinki (Finland, N = 187), Amiens (France, N = 381), Nuremberg and Bayreuth (Germany, N = 607), Reykjavik (Iceland, N = 405), Monza (Italy, N = 412), Rotterdam (the Netherlands, N = 198), Oslo (Norway, N = 388), Stockholm (Sweden, N = 246), and Maidstone and Ashford (United Kingdom, N = 289). This roster led to the creation of a cross-national population-based data set containing information on 4010 subjects, including data on vital status.

Data Collection

To accomplish the purpose of the AdHOC project, data were collected using the Minimum Data Set for Home Care (MDS-HC) assessment instrument, following the guidelines published in the MDS-HC manual.[16] In Finland, France, Germany, and Iceland, assessments were conducted by agency personnel; in all other countries, they were conducted by research assistants recruited for the project. All received a standardized training program on how to complete the assessment.

Patients invited to take part in the study were free to decline participation. Patient consent was obtained with assurance of data confidentiality, and ethical approval for the study was obtained in all countries according to local regulations.

MDS-HC Assessment Data

The MDS-HC contains over 350 data elements including sociodemographic variables and numerous clinical items about both physical and cognitive status, as well as all clinical diagnoses.[17] The MDS-HC also includes information about an extensive array of signs, symptoms, syndromes, and treatments being provided. A variety of different, multi-item summary scales are embedded in the MDS-HC instrument.

The Cognitive Performance Scale (CPS) score was used to assess cognitive status. The CPS is based on selected MDS items including 2 cognitive items (short-term memory and skills on decision making), a measure of communication ability (understood by others), self-performance in eating, and level of consciousness. The CPS combines these items within a single scale, creating 7 categories of cognitive impairment (0 = no impairment; 6 = very severe impairment). For the present study, a CPS score of 2 or greater was used to define cognitive impairment. Activities of daily living (ADL) were used to assess physical function, and disability was defined as the need of assistance in 1 or more of the following ADL: eating, dressing, transferring, mobility in bed, personal hygiene, and toileting. These items have been proven to provide a valid measure of function and cognitive status in frail home care patients.[17]

The MDS-HC has been developed in the United States, but this system for assessment is not a limited site- and country-specific tool. A study conducted among nursing home residents in 8 countries showed that the items included in the MDS-HC achieved an excellent reliability with no substantial differences across countries.[18] Moreover, in another international study,[19] collecting data on patients from 5 countries worldwide, items included in the MDS-HC instrument have been proved to have high reliability levels, comparable to those reported when tested among nursing home residents.

Assessment of Pain

Pain was defined as any type of pain or discomfort in any part of the body that was manifested less than daily or daily over the 7 days preceding the assessment.[16] The assessors were instructed to ask simple and direct questions about whether the participant experienced pain. Because some participants did not complain verbally, the assessors were also instructed to observe for indicators of pain, including moaning, crying, wincing, frowning, other facial

expressions, or posturing such as guarding or protecting an area of the body. For those participants with pain, additional information on pain severity (mild, moderate, severe, or excruciating), frequency (less than daily, daily with a single episode, or daily with multiple episodes), and number of painful sites (single or multiple) was also collected. Independent, dual assessment of pain items in a diverse sample of patients during testing and revision of the MDS-HC showed an average weighted kappa exceeding 0.7.[19]

Assessment of Depression

MDS Depression Rating Scale was used to assess the presence of depressive symptoms. Based on a previous observation, participants with a score ≥ 3 were diagnosed as depressed.[20] The MDS Depression Rating Scale has proven reliable for detecting depression among older adults.[20]

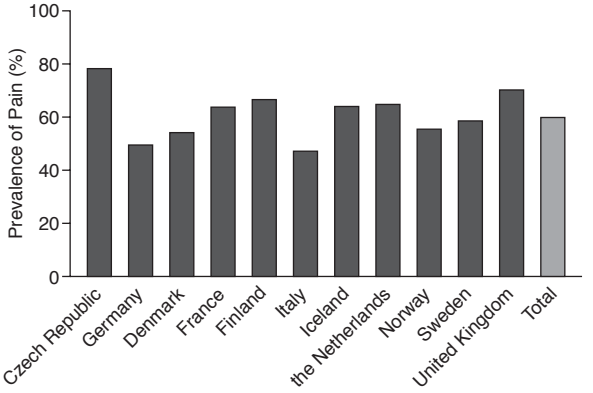
Statistical Analysis

From the initial sample of 4010 participants, we excluded subjects with missing data on pain assessment (N = 31) or on items included in the MDS Depression Rating Scale (N = 3). This resulted in a final sample size of 3976 participants. Differences between participants with and without pain in categorical parameters were tested using the χ^2 test. To establish whether pain was associated with depression, a logistic regression model was performed. This model was adjusted for those variables that are thought to be clinically significant or were associated with pain at $p \leq .10$ at the univariate analysis. We included in the model age, sex, living alone, a flare-up of a chronic or recurrent condition, ADL disability, cognitive impairment, ischemic heart disease, congestive heart failure, hypertension, stroke, peripheral vascular disease, chronic obstructive pulmonary disease, osteoarthritis, diabetes, cancer, Parkinson's disease, recent fractures, number of medications, use of antidepressants, and site.

In consideration of the fact that, in a previous publication,[15] characteristics of participants discriminated 3 clusters of countries, based on sociodemographic, functional, and clinical variables of participants, analysis was repeated after stratification of the sample across these 3 groups. Cluster 1 includes Czech Republic, Germany, Sweden, and United Kingdom; cluster 2, Italy and France; and cluster 3, Denmark, Finland, Iceland, Norway, and the Netherlands.

Since we hypothesized that female sex could modify the effect of pain on depression, we tested the interaction between pain and female sex. According to Rothman and Greenland,[21] we combined the 2 variables (sex and pain) into 1 variable with 4 levels (men and no pain, men with pain, women and no pain, women with pain). Then, we included 1 indicator variable for each level of the combined variable in a logistic regression model using male "men and no pain" as the reference category.

Figure 1. Prevalence of Pain by European Country in a Cross-Sectional Study of Older Adults



We estimated the synergy index (SI), which measures interaction as a departure from additivity of the effects. The SI is defined as:

$$SI = \frac{OR(AB) - 1}{[OR(A\bar{B}) - 1] + [OR(\bar{A}B) - 1]}$$

where OR represents the odds ratio and A and B denote the presence of and $\bar{A}$ and $\bar{B}$ the absence of the 2 risk factors. In the absence of interaction between the 2 risk factors, SI equals 1.

Finally, additional logistic regression models were performed to assess the association of pain severity, pain frequency, and number of painful sites with depression. Data were missing on pain severity for 5 participants, on pain frequency for 21 participants, and on number of painful sites for 48 participants. All analyses were performed using SPSS for Windows version 10.1 (SPSS Inc., Chicago, Ill.).

RESULTS

Mean age of 3976 subjects entering the study was 82.3 (standard deviation = 7.3) years, and 2948 (74.1%) were women. Of the total sample, 2380 subjects (59.9%) presented with pain, but the prevalence differed substantially among study sites, ranging from 78.7% in Czech Republic to 47.0% in Italy (Figure 1). In 656 subjects (27.6% of those with pain), pain was defined as mild; in 1061 (44.6%), moderate; in 516 (21.7%), severe; and in 142 (6.0%), excruciating. Pain occurred less than daily in 716 cases (30.1%), and in 1241 cases (52.1%) it was limited to a single site.

Characteristics of the study population according to the presence of pain are summarized in Table 1. Compared with participants without pain, those with pain were more likely to be women, to live alone, and to have a flare-up of a chronic condition. Also, participants with pain had a

Table 1. Characteristics of Study Population According to Presence of Pain, N (%)

Characteristic	No Pain (N = 1596)	Pain (N = 2380)	p
Age, y			.181
< 75	269 (16.9)	419 (17.6)	
75–84	681 (42.7)	1067 (44.8)	
≥ 85	646 (40.5)	894 (37.6)	
Women	1083 (67.9)	1865 (78.4)	< .001
Living alone	912 (57.1)	1487 (62.5)	.001
Explicit terminal illness[a]	11 (0.7)	21 (0.9)	.504
A flare-up of a chronic or recurrent condition	78 (4.9)	356 (15.0)	< .001
ADL disability[b]	640 (40.1)	860 (36.1)	.011
Cognitive impairment[c]	553 (34.7)	617 (25.9)	< .001
Disease			
Ischemic heart disease	236 (14.8)	557 (23.4)	< .001
Congestive heart failure	348 (21.8)	595 (25.0)	.020
Hypertension	475 (29.8)	846 (35.5)	< .001
Peripheral vascular disease	146 (9.2)	422 (17.7)	< .001
Stroke	294 (18.4)	389 (16.3)	.089
Diabetes	272 (17.0)	444 (18.7)	.196
COPD	143 (9.0)	289 (12.1)	.002
Parkinson's disease	83 (5.2)	116 (4.9)	.643
Cancer	122 (7.6)	196 (8.2)	.563
Osteoarthritis	170 (10.7)	870 (36.6)	< .001
Recent fracture (any site)	173 (10.8)	473 (19.9)	< .001
No. of medications			< .001
0–3	583 (36.5)	478 (20.1)	
4–6	558 (35.0)	788 (33.1)	
≥ 7	455 (28.5)	1114 (46.8)	
Use of antidepressants	217 (13.6)	367 (15.4)	.143

[a]Less than 6 months of expected survival.
[b]Need of assistance in 1 or more of the following ADL: eating, dressing, transferring, mobility in bed, personal hygiene, and toileting.
[c]Defined as Cognitive Performance Scale (CPS) score ≥ 2; data on CPS were missing on 3 participants.
Abbreviations: ADL = activities of daily living, COPD = chronic obstructive pulmonary disease.

lower prevalence of cognitive impairment and physical disability and were receiving more medications. Among individuals with pain, there was significantly higher prevalence of ischemic heart disease, congestive heart failure, hypertension, peripheral vascular disease, chronic obstructive pulmonary disease, osteoarthritis, and recent fractures.

Overall, depression was identified in 645 participants (16.2%). As shown in Table 2, depression was present in 181 of 1596 (11.3%) participants without pain and in 464 of 2380 (19.5%) participants with pain ($p < .001$). After adjusting for potential confounders, pain was significantly associated with depression (odds ratio [OR] = 1.76; 95% confidence interval [CI] = 1.43 to 2.17). The association between pain and depression was consistent among participants with and without cognitive impairment (cognitive impairment: OR = 1.74, 95% CI = 1.31 to 2.31; no cognitive impairment: OR = 1.78, 95% CI = 1.31 to 2.42) and across clusters of countries as defined on the basis of characteristics of participants (cluster 1: OR = 1.89, 95% CI = 1.37 to 2.63; cluster 2: OR = 1.54, 95% CI = 1.06 to 2.24; cluster 3: OR = 1.82, 95% CI = 1.21 to 2.73).

Table 3 shows the combined effect of female sex and pain on depression. Compared to men without pain, women with pain were significantly more likely to present with depression (OR = 1.77; 95% CI = 1.29 to 2.42), while no significant difference was observed for women without pain (OR = 0.86; 95% CI = 0.61 to 1.22) and men with pain (OR = 1.24; 95% CI = 0.86 to 1.79). The SI was 7.7, suggesting that female sex may modify the effect of pain on depression.

Table 4 reports the associations of depression with pain severity, pain frequency, and number of painful sites according to sex. Among women, the association of pain and depression became progressively more pronounced as pain severity, pain frequency, and number of painful sites increased, while among men this association was weaker, and it never reached statistical significance.

DISCUSSION

Among older adults living in the community and receiving home care services, we show a cross-sectional association between pain and depression, irrespective of comorbidity and other potential confounders. This association is more pronounced among women than men, and it correlates with severity, frequency, and number of painful sites.

Our study shows that pain is a common condition among older adults living in Europe, being present in almost 60% of participants. The prevalence of pain varies among countries, ranging from 47% to 79%. This finding may be ascribed to the heterogeneity of national community care services that target older adults with different sociodemographic, functional, and clinical characteristics.[15]

In agreement with previous reports,[11–13,22] we find that impaired cognitive function is associated with a decreased notation of pain. Despite the fact that several authors have suggested that there appears to be no valid difference of pain complaints among cognitively intact and markedly impaired individuals, the issue remains controversial.[23–27] Indeed, as previously noted, this finding seems to reinforce the notion that impaired cognitive status contributes to underreporting of pain.[11,28] In this context, it is important to highlight that the association between pain and depressive symptoms is consistent in subjects either with or without cognitive impairment.

The present study extends the existing evidence suggesting an association between pain and depressive symptoms to a frail population in home care in Europe. Magni and colleagues,[29] using a large database from a U.S. household survey, demonstrated that the prevalence of depressive symptoms in individuals with pain was significantly higher than in individuals without pain (18% versus 8%, respectively). Ohayon,[30] using a database from a large European telephone survey, showed that chronic pain was

Table 2. Presence of Depression Among Older Adults in Europe According to Presence of Pain

Variable	N	Depression, N (%)	Crude OR (95% CI)	Adjusted OR (95% CI)[a]
Total sample				
No pain	1596	181 (11.3)	1.00 (reference)	1.00 (reference)
Any pain	2380	464 (19.5)	1.89 (1.57 to 2.28)	1.76 (1.43 to 2.17)
Cognitive impairment[b]				
No pain	553	99 (17.9)	1.00 (reference)	1.00 (reference)
Any pain	617	205 (33.2)	2.28 (1.73 to 3.00)	1.74 (1.31 to 2.31)
No cognitive impairment[b]				
No pain	1042	82 (7.9)	1.00 (reference)	1.00 (reference)
Any pain	1761	259 (14.7)	2.02 (1.56 to 2.62)	1.78 (1.31 to 2.42)
Cluster 1[c]				
No pain	586	70 (11.9)	1.00 (reference)	1.00 (reference)
Any pain	983	234 (23.8)	2.30 (1.72 to 3.08)	1.89 (1.37 to 2.63)
Cluster 2[c]				
No pain	355	72 (20.3)	1.00 (reference)	1.00 (reference)
Any pain	433	115 (26.6)	1.42 (1.02 to 1.99)	1.54 (1.06 to 2.24)
Cluster 3[c]				
No pain	655	39 (6.0)	1.00 (reference)	1.00 (reference)
Any pain	964	115 (11.9)	2.14 (1.47 to 3.12)	1.82 (1.21 to 2.73)

[a]Adjusted for age, sex, living alone, a flare-up of a chronic or recurrent condition, activities of daily living disability, cognitive impairment, ischemic heart disease, congestive heart failure, hypertension, stroke, peripheral vascular disease, chronic obstructive pulmonary disease, osteoarthritis, diabetes, cancer, Parkinson's disease, recent fractures, number of medications, use of antidepressants, and site.
[b]Defined as Cognitive Performance Scale (CPS) score ≥ 2; data on CPS were missing on 3 participants.
[c]Cluster 1 includes Czech Republic, Germany, Sweden, and United Kingdom; cluster 2, Italy and France; and cluster 3, Denmark, Finland, Iceland, Norway, and the Netherlands.
Abbreviations: CI = confidence interval, OR = odds ratio.

Table 3. Modification of Pain Effect by Sex on Depression Among Older Adults in Europe

Variable	N	Depression, N (%)	Crude OR (95% CI)	Adjusted OR (95% CI)[a]
Women with pain	1865	371 (19.9)	1.60 (1.21 to 2.11)	1.77 (1.29 to 2.42)
Women and no pain	1083	112 (10.3)	0.54 (0.62 to 1.02)	0.86 (0.61 to 1.22)
Men with pain	515	93 (18.1)	1.43 (1.02 to 2.00)	1.24 (0.86 to 1.79)
Men and no pain	513	69 (13.5)	1.00 (reference)	1.00 (reference)

[a]Adjusted for age, living alone, a flare-up of a chronic or recurrent condition, activities of daily living disability, cognitive impairment, ischemic heart disease, congestive heart failure, hypertension, stroke, peripheral vascular disease, chronic obstructive pulmonary disease, osteoarthritis, diabetes, cancer, Parkinson's disease, recent fractures, number of medications, use of antidepressants, and site.
Abbreviations: CI = confidence interval, OR = odds ratio.

present in nearly half of subjects with major depressive disorder and affected the duration of depressive episodes and their recurrence. Currie and Wang,[31] using a database from a large Canadian health survey of household individuals, documented that the rate of major depression was approximately 6% in pain-free individuals and 20% in persons with chronic back pain. Recently, an international study from the World Health Organization on affective and psychological disorders in primary care documented that more than 30% of subjects with pain at the same time met criteria for depressive problems.[32]

The association between pain and depressive symptoms can find multiple explanations. On one side, neurochemical changes in serotonergic or noradrenergic function that occur as a consequence of depression could possibly participate in painful sensation.[33,34] Such changes are thought to increase sensitivity to painful stimuli and therefore render persons more susceptible to pain. In turn, pain may increase the turnover of serotonin, leading to the onset of depressive symptoms.[34] In this context, it is relevant to note that treatment of depression with drugs that may raise levels of serotonin and norepinephrine in the central nervous system seems to modulate the pain threshold.[35,36] Instead, there is not yet clear evidence that analgesic treatment has an impact on depressive symptoms, and it has been shown that the use of nonsteroidal anti-inflammatory drugs may be associated with an increased risk of psychiatric conditions, including depression.[37]

Interestingly, in our sample the association between pain and depression seems stronger in women than men. Previous studies have already suggested this difference: Magni et al.[29] reported that among subjects with musculoskeletal pain, women were significantly more likely to experience depression. Cuban and Mexican women with abdominal pain in the same database were significantly more likely to be depressed than Cuban or Mexican men.[38] A possible explanation is that women have an increased tendency to focus on and exaggerate the painful stimuli and negatively evaluate their ability to deal with pain.[39] This phenomenon, known as *catastrophizing*,

Table 4. Association of Depression With Pain Severity, Pain Frequency, and Number of Painful Sites Among Older Adults in Europe[a]

	Men (N = 1028)		Women (N = 2948)	
Variable	Depression Rate, N/N (%)	Adjusted OR (95% CI)[b]	Depression Rate, N/N (%)	Adjusted OR (95% CI)[b]
Pain severity				
No pain	69/513 (13.5)	1.00 (reference)	112/1083 (10.3)	1.00 (reference)
Mild	27/175 (15.4)	0.95 (0.56 to 1.59)	74/481 (15.4)	1.57 (1.12 to 2.20)
Moderate	36/226 (15.9)	1.04 (0.63 to 1.71)	171/835 (20.5)	2.44 (1.83 to 3.26)
Severe	24/90 (26.7)	1.53 (0.83 to 2.83)	93/426 (21.8)	2.32 (1.65 to 3.25)
Excruciating	6/24 (25.0)	2.12 (0.72 to 6.18)	33/118 (28.0)	3.38 (2.02 to 5.66)
Pain frequency				
No pain	69/513 (13.5)	1.00 (reference)	112/1083 (10.3)	1.00 (reference)
Less than daily	23/189 (12.2)	0.78 (0.45 to 1.34)	86/527 (16.3)	1.58 (1.14 to 2.20)
Daily, single episode	17/95 (17.9)	1.15 (0.61 to 2.17)	75/368 (20.4)	2.20 (1.56 to 3.10)
Daily, multiple episodes	52/226 (23.0)	1.53 (0.94 to 2.47)	206/954 (21.6)	2.53 (1.90 to 3.37)
Painful sites				
No pain	69/513 (13.5)	1.00 (reference)	112/1083 (10.3)	1.00 (reference)
Single site	45/301 (15.0)	0.95 (0.60 to 1.49)	154/940 (16.4)	1.83 (1.37 to 2.43)
Multiple sites	45/200 (22.5)	1.32 (0.82 to 1.13)	208/891 (23.3)	2.42 (1.83 to 3.20)

[a]Data were missing on pain severity for 5 participants, on pain frequency for 21 participants, and on number of painful sites for 48 participants.
[b]Adjusted for age, living alone, a flare-up of a chronic or recurrent condition, activities of daily living disability, cognitive impairment, ischemic heart disease, congestive heart failure, hypertension, stroke, peripheral vascular disease, chronic obstructive pulmonary disease, osteoarthritis, diabetes, cancer, Parkinson's disease, recent fractures, number of medications, use of antidepressants, and site.
Abbreviations: CI = confidence interval, OR = odds ratio.

seems more frequent in women than in men, and could be explained by learning models. Women and men have somewhat different experiences of pain over a lifetime that may necessitate different constructs of pain meaning and related copying behaviors.[40] An alternative explanation includes the fact that women and men are exposed to different social role expectations.[40] As a result, men may be less likely to show emotional distress as consequence of pain.

However, not all clinical studies reported higher rates of depression for women. Buckelew et al.,[41] in a sample of subjects with a variety of pain complaints, found that men reported higher rates of somatization, depression, and anxiety than women.

Some limitations of the present study need to be recognized. First, the cross-sectional design of our research does not allow us to establish a cause-effect relationship between depressive symptoms and pain, and therefore we are unable to determine if depressive symptoms were the results of pain rather than the causative factors. Second, although the MDS-HC is a standardized, comprehensive assessment instrument, the recording of pain is not its specific focus. Pain was assessed based on evaluation by the home care staff (including the general practitioner), and the potential for overestimation or underestimation remains a concern, especially among those with difficulty communicating. Third, the results we observed refer to a group of medically ill older adults requiring home care. In these subjects, both pain and depression are usually persistent over time and frequently associated with medical comorbidities and impaired functional status. Therefore our findings cannot be generalizable to healthier populations in different settings. Finally, we lack data on specific pain medications, and we were not able to identify specific causes and the duration of pain.

In conclusion, this cross-sectional study provides evidence from a large sample of frail elderly patients showing an association between pain and depression. The pain-depression dyad represents an important health problem that is correlated with high rates of disability, morbidity, consumption of health care resources, and socioeconomic difficulties. Despite this evidence, pain and depression are still inadequately treated, and there is a general lack of knowledge about their correlation.[11–13,42] For this reason, treatment models that put together the assessment and the treatment of both pain and depression are indispensable for better outcomes. More research is required to establish if mitigation of pain is correlated to the alleviation of depressive symptoms in older adults.

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