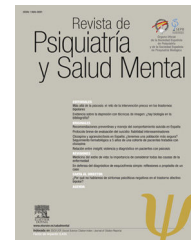




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## ORIGINAL ARTICLE

# Depression and associated variables in people over 50 years in Spain<sup>☆</sup>



Cristina Portellano-Ortiz<sup>a,\*</sup>, Josep Garre-Olmo<sup>b,c</sup>, Laia Calvó-Perxas<sup>b</sup>,  
Josep Lluís Conde-Sala<sup>a</sup>

<sup>a</sup> *Facultad de Psicología, Universidad de Barcelona, Barcelona, Spain*

<sup>b</sup> *Instituto de Investigación Biomédica de Girona (IdIBGI), IAS Unidad de Investigación, Salt, Girona, Spain*

<sup>c</sup> *Departamento de Ciencias Médicas, Universidad de Girona, Girona, Spain*

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### KEYWORDS

Ageing;  
Depression;  
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EURO-D;  
Physical health

### Abstract

**Introduction:** Depression is a common and disabling psychiatric disorder in adulthood and is associated with higher mortality and functional disability.

**Objectives:** To determine the association between clinical and sociodemographic variables with depression in a sample of people over 50 years old living in Spain, and compare the prevalence of depression with the other Survey of Health, Ageing and Retirement (SHARE) countries.

**Material and methods:** There were 5830 participants in the Spanish sample of the Wave 5, 2013, of SHARE. **Tools used:** EURO-D (Depression) and CASP-12 (Quality of Life). **Statistical analysis:** bivariate, and binary logistic.

**Results:** The variables associated with depression in the binary logistic regression (EURO-D  $\geq 4$ ) were poor self-perceived physical health (OR = 13.34; 95% CI: 9.74–18.27), having more than 2 difficulties in Activities of Daily Living (ADL) (OR = 4.46; 95% CI: 3.13–6.34) and female gender (OR = 2.16; 95% CI: 1.83–2.56). Depression was more common among participants with Alzheimer (76.4%), emotional disorders (73.9%), Parkinson (57.4%), hip fracture (55.4%), and rheumatism (50.9%). Compared with other European countries, Spain had a percentage of people with depression (29.3%) that was higher than the European average (27.9%).

**Conclusions:** The most important variables associated with depression were poor perceived physical health, presence of difficulties in ADL, and female gender.

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\* Corresponding author.

E-mail address: [cristina.portellano@ub.edu](mailto:cristina.portellano@ub.edu) (C. Portellano-Ortiz).

**PALABRAS CLAVE**

Envejecimiento;  
Depresión;  
SHARE;  
EURO-D;  
Salud física

**Depresión y variables asociadas en personas mayores de 50 años en España****Resumen**

*Introducción:* La depresión es un trastorno psiquiátrico incapacitante y frecuente en la edad adulta asociado a mayor mortalidad y discapacidad funcional.

*Objetivos:* Determinar la asociación de las variables clínicas y sociodemográficas con la depresión, en una muestra de personas mayores de 50 años residentes en España, y comparar la prevalencia de depresión con los demás países del estudio *Survey of Health, Ageing and Retirement in Europe* (SHARE).

*Material y métodos:* Muestra de 5.830 participantes de la muestra española de la «Wave 5», de 2013, del estudio SHARE. Instrumentos: EURO-D (depresión) y CASP-12 (calidad de vida). Análisis estadístico: bivariante y logístico binario.

*Resultados:* En la regresión logística binaria, las variables asociadas a la depresión (EURO-D  $\geq 4$ ) fueron, principalmente, la mala percepción de salud física (OR = 13,34; IC 95%: 9,74-18,27), la presencia de más de 2 dificultades en las actividades de la vida diaria (AVD) (OR = 4,46; IC 95%: 3,13-6,34) y el género femenino (OR = 2,16; IC 95%: 1,83-2,56). La depresión fue más frecuente en los participantes que padecían Alzheimer (76,4%), trastornos emocionales (73,9%), Parkinson (57,4%), fractura de cadera (55,4%) y reumatismos (50,9%). En la comparación con países europeos, España tenía un porcentaje de personas con depresión (29,3%) superior a la media europea (27,9%).

*Conclusiones:* Las variables más relevantes asociadas a la depresión fueron la mala percepción de salud física, la presencia de dificultades en las AVD y el género femenino.

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**Introduction**

Depression is a disabling psychiatric disorder that occurs frequently in the adult population. It is associated with increased mortality and a negative effect on the functioning and well-being of the elderly. It tends to become chronic and progresses with relapses and recurrences.<sup>1,2</sup> Many studies have estimated its prevalence in the elderly, although the resulting figures vary very widely, from 0.4 to 35%.<sup>3</sup> These discrepancies may be due to methodological differences and/or cultural aspects of the expression of depression.<sup>4</sup>

Respecting the prevalence data in the Spanish population, in the 2014 European health survey (INE), the rate of depression during the last twelve months in those over the age of 55 years old stood at 12.9%. The corresponding figure for those over the age of 75 years old was higher, at 15.0%.<sup>5</sup> Primary care studies show a prevalence of from 16.0% to 34.5%.<sup>6-8</sup> In community samples the prevalence of depressive symptoms amounted to 19.7%, while the corresponding figure for clinical depression was 5.0%.<sup>9</sup> The prevalence of major depressive disorder was 4.3% in a study in the south of Spain,<sup>10</sup> while the ESEMeD-España study<sup>11</sup> found a prevalence throughout life of 10.6% and in the last 12 months of 4.0%. Values were higher in the 50–64 years old group, and they then fell at greater age. The authors state that the prevalence of major depressive disorder is lower in Spain than it is in other Western countries.

Respecting the clinical and sociodemographic variables which are associated with depression in old age, age itself is a controversial factor as although risk increases with age, it is also concomitant with greater health problems.<sup>12</sup>

There is a high level of agreement among studies that depression is more frequent in women,<sup>5-8,10,11,13,14</sup> single individuals<sup>15</sup> and those with a lower educational level, all of which are associated with increased risk of depression in the elderly.<sup>6</sup>

Neuropsychiatric disorders including depression were one of the main causes of disablement in Spain in 2010.<sup>16</sup> The relationship between depression, physical disablement and chronic diseases<sup>17</sup> is especially important in old age, so that poor physical health and chronic diseases lead to greater disablement and are associated with increased depression.<sup>18-21</sup> On the other hand, physical exercise has a favourable effect on mood and improves the quality of life, in spite of the difficulty in motivating depressed individuals to commence it.<sup>7,22</sup>

In terms of social aspects, depression is associated with a higher degree of social isolation in the geriatric population,<sup>23</sup> while elderly individuals who live with family members have more social contacts and score significantly higher for physical, mental and emotional health.<sup>24</sup> Moreover, the performance of activities has a protective effect against the possible appearance of depressive symptoms.<sup>25</sup>

In economic terms, ceasing to work involuntarily increases the risk of depression in those aged over 50 years old,<sup>15,26</sup> while doing so at retirement age is beneficial for general health.<sup>27</sup> On the other hand, consistent data indicate that the prevalence of depression is greater among those individuals with lower incomes.<sup>28</sup>

Finally, the presence of depression accelerates the ageing process, reducing satisfaction<sup>29</sup> and the quality of life.<sup>30</sup>

The aims of this study were: (1) to determine the degree to which depression is associated with clinical and

sociodemographic variables in a sample of individuals over the age of 50 years old who live in Spain, and (2) to compare the prevalence of depression in the Spanish sample with the other countries in the SHARE study.

## Method

### Study design and population

Spanish population data corresponding to Wave 5 (2013) of the SHARE study were used, with a panel, transversal and multidisciplinary database containing information on the health, economic situation and social and family networks of non-institutionalised individuals over the age of 50 years old in 14 European countries and Israel.<sup>31,32</sup>

The final sample in this study included 5830 participants, after excluding those cases in which information had been lost on the variables corresponding to each one of the EURO-D dependent variable items.

### Variables and instruments

- **Sociodemographic data.** Information about age, sex, marital status, educational level and work situation was gathered under specific headings.
- **Physical health.** Subjective perceptions of general health were evaluated (as very good, good, mediocre or poor). The presence of different self-assessed diseases was also evaluated, such as rheumatism and high cholesterol, etc.
- **Physical exercise.** The practice of moderate and/or vigorous physical exercise was analysed (at more than once a week, once a week, from one to three times per month or practically never).
- **Household unit.** The size of households was examined (living alone, two people living together or more than 3 people).
- **Chronic diseases.** Data were gathered on the presence of chronic diseases (none, one, 2 or more).
- **Activity.** Items that asked about occupations and the predominant type of the same were used (social or individual).
- **Life satisfaction.** Data were gathered on perceived subjective satisfaction, on a scale from 0 to 10.
- **Income.** Total household income was evaluated in percentiles, along a 5-level gradient.
- **ELA difficulties.** The total number of basic and instrumental ELA was analysed, together with those in which deficits existed.
- **Depressive symptoms.** These were evaluated using the EURO-D scale, which is composed of 12 items (the presence of depressive symptoms, pessimism, death wishes, guilt, irritability, crying, fatigue, sleep problems, loss of interest and appetite, a reduction in the ability to concentrate and for enjoyment in the past month), with a cut-off point of  $\geq 4$ .<sup>4,33</sup> The replies were dichotomous as either present or absent, with a range of from 0 to 12 points. A higher score indicated a greater presence of depressive symptoms. Cronbach's alpha in the *Eurodep Study*<sup>34</sup> was moderate, at from 0.61 to 0.75, while in this study it was 0.79.

- **Quality of life.** The *Control, Autonomy, Pleasure and Self-realization* (CASP-12)<sup>31,35</sup> scale was used, in the reduced version of the original CASP-19<sup>36</sup> which was specifically designed for use in SHARE (CASP-12v.1).<sup>37</sup> This scale identifies specific quality of life aspects in ageing. It covers 4 areas: control, pleasure, independence and self-realisation. Using a Likert-type 4-point scale, these evaluate how often certain feelings and situations are experienced (3 in each domain). The scores range from 12 to 48 points, with the following categories: low (<35 points), moderate (35–37 points), high (38–39), and very high (>39).<sup>36</sup> Cronbach's alpha was 0.84 in the analysis of the psychometric properties on the scale, while in this study it was 0.81.

### Procedure

Data were gathered in a 90 min interview in the respondent's home. It included questions on physical health, risk behaviours, cognitive function, mental health, work and retirement, family relationships, social support, financial matters, the home, family unit income, consumption, activities and expectations.<sup>31,32</sup>

### Statistical analysis

A descriptive study was undertaken of the clinical and sociodemographic characteristics of the sample using central tendency measurements and dispersion measurements for the quantitative variables and absolute and relative frequencies for the qualitative variables.

The association of each independent variable with the presence of depression was studied. Contrasts of the categorical variables were performed by using the Chi-squared test. Correlations were measured using Spearman's correlation coefficient ( $r_s$ ), and this was interpreted as follows:  $r_s \leq 0.30$  is a weak correlation;  $0.30-0.50$  is a moderate correlation, and  $r_s \geq 0.50$  is a strong correlation.

Due to the large size of the sample, the variables studied were always significant. To complement significance the size of the effect of differences were calculated. Cramer's  $V$  ( $V$ ) was used to evaluate the magnitude of the effect of the difference between percentages, the values of which depend on the degrees of freedom, (1)  $gl_1$ : weak (<0.30), moderate (0.30–0.49), strong ( $\geq 0.50$ ); (2)  $gl_2$ : weak (<0.20), moderate (0.21–0.34), strong ( $\geq 0.35$ ), and (3)  $gl_3$ : weak (<0.17), moderate (0.17–0.28), strong ( $\geq 0.29$ ).<sup>38</sup>

To identify the variables associated with the dichotomic dependent variable (depression or no depression) binary logistic regression analysis was performed using the "backwards method: Wald", entering first the variables of age, sex, marital status, educational level, work situation, physical health, exercise level, household unit, chronic diseases, type of activity, income and ELA difficulties.

To distinguish physical disease comorbidity more specifically the frequency of each disease was measured together with its relationship with depression.

Lastly, to compare depression in Spain with levels in other countries, comparative analysis was performed of prevalence using data from the other countries in SHARE. Weighted data were used for this, with the weightings

**Table 1** Clinical and sociodemographic variables (n = 5830).

<b>Age</b>	
Average (SD)	67.9 (10.5)
Range	50–104
<b>Age, groups, %</b>	
<60 years old	26.1
61–70 years old	34.8
71–80 years old	24.6
≥80 years old	14.5
<b>Sex, %</b>	
Male	46.3
Female	53.7
<b>Marital status, %</b>	
Married	78.8
Single	5.1
Divorced	3.9
Widowed	12.1
<b>Educational level, group, %</b>	
0–5 years	23.6
6–8 years	28.5
9–12 years	23.6
>12 years	24.2
<b>Work situation, %</b>	
Retired	46.1
In work	23.8
Unemployed	6.0
Disabled	3.8
Housework	20.3
<b>Physical health, %</b>	
Very good	19.6
Good	39.9
Mediocre	28.1
Poor	12.4
<b>Exercise level, %</b>	
>Once a week	23.6
Once a week	9.2
1–3 times a month	7.4
Almost never	59.9
<b>Household unit, %</b>	
Alone	13.3
2 people	53.6
≥3 people	33.1
<b>Chronic diseases, %</b>	
None	34.2
1	32.5
≥2	33.4
<b>Type of activity, %</b>	
None	40.3
Social	4.5
Individual	40.0
Both	15.1

Table 1 (Continued)

<b>Income, percentile, %</b>	
0–20	20.0
20–40	19.8
40–60	20.1
60–80	20.0
80–100	20.1
<b>ELA difficulties, %</b>	
None	87.3
1–2	7.1
>2	5.6
<b>EURO-D, score</b>	
Average (SD)	2.53 (2.62)
≥4 points, %	29.1
<b>CASP-12</b>	
Average (SD)	35.8 (6.3)
Range	12–48
<b>Life satisfaction</b>	
Average (SD)	7.42 (1.7)
Range	0–10

ELA: everyday life activities; CASP-12: quality of life (Control, Autonomy, Pleasure and Self-realisation); SD: standard deviation; EURO-D: depression scale.

supplied by SHARE in the specific ‘‘gv.weights’’ module that compensate for the probabilities of unequal selection of population parameters.<sup>32</sup> The other calculations were not weighted.

The level of statistical significance for hypothesis contrasts was 0.05. Statistical analysis was performed using the SPSS v22.0 programme for Windows (SPSS Inc., Chicago, IL, USA).

## Results

### Sample sociodemographic and clinical data

The study sample was composed of 5830 participants. The average age was  $67.9 \pm 10.5$  years old, and slightly more women took part. 78.8% of the participants were either married or lived with their partner. The majority were retired. 59.5% of the participants stated that their physical health was good or very good, that they had few restrictions in their ELA, while 40.2% occasionally did physical exercise.

The percentage that surpassed the EURO-D cut-off point ( $\geq 4$ ) was 29.1%, while the average score on the scale was  $2.5 \pm 2.6$ . The average CASP-12 score showed a moderate perception of their quality of life. The complete data are shown in Table 1.

### Depression and variables

Depression increased with age, with a higher proportion of cases in those above 80 years old. The presence of chronic diseases (CD) and functional deficits (FD) in ELA increased with age: <60 years old (CD = 44.9%, FD = 3.7%); 60–70 years

**Table 2** Characteristics associated with depression ( $\geq 4$  EURO-D) in Spanish individuals older than 50 years old.

	%	OR (CI 95%)
<b>Age</b>		
<60 years old	21.5	1.00
61–70 years old	24.8	1.20 (1.02–1.41)
71–80 years old	32.3	1.73 (1.47–2.05)
$\geq 80$ years old	47.7	3.33 (2.78–4.00)
$\chi^2 = 209.7$ ; $p < 0.001$ ; $V = 0.19$		
<b>Sex</b>		
Male	19.8	1.00
Female	37.1	2.39 (2.12–2.69)
$\chi^2 = 211.4$ ; $p < 0.001$ ; $V = 0.19$		
<b>Marital status</b>		
Married	25.6	1.00
Single	25.0	0.97 (0.73–1.27)
Divorced	35.1	1.57 (1.18–2.09)
Widowed	52.0	3.15 (2.67–3.71)
$\chi^2 = 208.5$ ; $p < 0.001$ ; $V = 0.19$		
<b>Educational level</b>		
>12 years	17.4	1.00
9–12 years	25.1	1.59 (1.31–1.92)
6–8 years	29.9	2.01 (1.68–2.41)
0–5 years	42.8	3.55 (2.96–4.24)
$\chi^2 = 217.0$ ; $p < 0.001$ ; $V = 0.19$		
<b>Work situation</b>		
In work	14.7	1.00
Retired	28.3	2.29 (1.92–2.72)
Unemployed	28.7	2.33 (1.76–3.08)
Housework	41.9	4.18 (3.46–5.06)
Disabled	56.2	7.45 (5.48–10.13)
$\chi^2 = 307.5$ ; $p < 0.001$ ; $V = 0.23$		
<b>Physical health</b>		
Very good	8.9	1.00
Good	16.3	1.97 (1.57–2.49)
Mediocre	41.9	7.35 (5.86–9.21)
Poor	73.2	27.90 (21.48–36.24)
$\chi^2 = 1.225$ ; $p < 0.001$ ; $V = 0.45$		
<hr/>		
	%	OR (CI 95%)
<b>Exercise level</b>		
Once a week	16.9	1.00
>Once a week	18.4	1.10 (0.85–1.44)
1–3 times a month	18.6	1.12 (0.80–1.56)
Almost never	36.5	2.81 (2.22–3.56)
$\chi^2 = 228.7$ ; $p < 0.001$ ; $V = 0.19$		
<b>Household unit</b>		
$\geq 3$ people	26.3	1.00
2 people	27.0	1.03 (0.91–1.17)
Alone	44.5	2.24 (1.88–2.66)
$\chi^2 = 102.9$ ; $p < 0.001$ ; $V = 0.13$		
<b>Chronic diseases</b>		
None	19.1	1.00
1	25.9	1.48 (1.27–1.72)
$\geq 2$	42.5	3.13 (2.71–3.61)
$\chi^2 = 275.3$ ; $p < 0.001$ ; $V = 0.21$		

**Table 2 (Continued)**

	%	OR (CI 95%)
<b>Type of activity</b>		
Both	19.2	1.00
Individual	22.2	1.20 (0.99–1.46)
Social	25.9	1.47 (1.06–2.03)
None	39.8	2.78 (2.30–3.35)
$\chi^2 = 225.9$ ; $p < 0.001$ ; $V = 0.19$		
<b>Income, percentile</b>		
80–100	18.6	1.00
60–80	24.1	1.38 (1.13–1.69)
40–60	29.9	1.86 (1.54–2.26)
20–40	36.6	2.52 (2.08–3.05)
0–20	36.4	2.50 (2.07–3.02)
$\chi^2 = 138.7$ ; $p < 0.001$ ; $V = 0.15$		
<b>ELA difficulties</b>		
None	23.0	1.00
1–2	64.0	5.93 (4.80–7.33)
>2	79.4	12.85 (9.75–16.95)
$\chi^2 = 733.3$ ; $p < 0.001$ ; $V = 0.35$		

Values where  $p < 0.05$  are shown in bold type.

ELA: everyday life activities; CASP-12: Quality of life (Control, Autonomy, Pleasure and Self-realisation); EURO-D: depression scale (<4 EURO-D: no depression;  $\geq 4$  EURO-D: depression); CI: confidence of interval; OR: crude Odds ratio; V: Cramer's V;  $\chi^2$ : Chi-squared.

old (CD = 66.3%, FD = 7.0%); 71–80 years old (CD = 79.1%, FD = 16.2%), and  $>80$  years old (CD = 80.0%, FD = 36.4%).

Depression was more present in widowed individuals and those who lived alone than was the case for those who were married or lived in company.

It was more frequent in women, who were more likely to be widowed than the men (18.6% vs. 4.6%), and more of them lived alone than did the men (16.7% vs. 9.5%).

A lower educational level was associated with a higher frequency of depression, a greater presence of chronic diseases (76.0%) and income lower than percentile 50 (68.4%), as opposed to a higher educational level with fewer diseases (56.5%) and a higher income  $>50$  p. (33.0%).

Poor perception of physical health, a lack of physical exercise, suffering 2 or more chronic diseases and difficulties in ELA were associated with greater depression. Likewise, not performing activities, a lower frequency of work activity and low economic income were also associated with greater depression.

The variables with a higher risk of depression (Odds ratio [OR]) were poor perception of physical health and difficulties in ELA. The complete data are shown in [Table 2](#)

### Binary logistic regression with depression

In the binary logistic regression model the variables with the greatest risk of depression were: poor physical health, difficulties in ELA, female sex, not performing activities, not working, not being married and presence of chronic diseases. The risk of depression increased notably with poor perception of physical health (OR = 13.34; CI 95%: 9.74–18.27) and with more than 2 ELA difficulties (OR = 4.46;

**Table 3** Binary logistic regression. Independent characteristics associated with depression.

Method: Backwards Wald	B (SE)	Wald	p	OR	CI 95%
<i>Perception of physical health</i>					
Very good (ref.)				1.00	
Good	0.63 (0.12)	24.3	<0.001	1.88	1.46–2.42
Mediocre	1.67 (0.13)	159.7	<0.001	5.31	4.10–6.89
Poor	2.59 (0.16)	261.4	<0.001	13.34	9.74–18.27
<i>ELA (difficulties)</i>					
No deficit (ref.)				1.00	
1–2 deficits	1.06 (0.13)	62.8	<0.001	2.89	2.22–3.76
>2 deficits	1.49 (0.18)	68.8	<0.001	4.46	3.13–6.34
<i>Sex</i>					
Male (ref.)				1.00	
Female	0.77 (0.08)	81.9	<0.001	2.16	1.83–2.56
<i>Type of activities</i>					
Both (ref.)				1.00	
Individual	−0.16 (0.11)	1.9	0.163	0.85	0.67–1.06
Social	0.22 (0.19)	1.3	0.254	1.24	0.85–1.83
None	0.32 (0.11)	7.7	<b>0.005</b>	1.37	1.09–1.72
<i>Work situation</i>					
In work (ref.)				1.00	
Retired	0.02 (0.11)	0.0	0.792	1.02	0.83–1.27
Housework	0.27 (0.12)	5.0	<b>0.025</b>	1.31	1.03–1.67
Disabled	0.46 (0.19)	5.4	<b>0.019</b>	1.58	1.07–2.33
Unemployed	0.66 (0.16)	16.7	<0.001	1.93	1.41–2.65
<i>Marital status</i>					
Married (ref.)				1.00	
Single	−0.16 (0.18)	0.7	0.380	0.84	0.59–1.22
Widowed	0.31 (0.14)	5.0	<b>0.025</b>	1.37	1.04–1.81
Divorced	0.62 (0.18)	11.0	<b>0.001</b>	1.86	1.29–2.69
<i>Chronic diseases</i>					
None (ref.)				1.00	
1 disease	0.07 (0.09)	0.6	0.433	1.07	0.89–1.29
≥2 diseases	0.33 (0.09)	11.8	<b>0.001</b>	1.39	1.15–1.68
<i>Household unit</i>					
≥3 people (ref.)				1.00	
2 people	−0.09 (0.08)	1.2	0.254	0.90	0.77–1.07
Alone	0.29 (0.15)	3.8	<b>0.049</b>	1.34	1.00–1.80

$R^2$  Nagelkerke = 0.357.

Hosmer and Lemeshow test:  $\chi^2 = 9.6$ ;  $p = 0.293$ .

Correctly classified: 78.7%.

Dependent binary variable: 0 = no depression (<4 EURO-D); 1 = depression (≥4 EURO-D).

Values where  $p < 0.05$  are shown in bold type.

B: unstandardised coefficient; SE: standard error; CI: confidence of interval; OR: multivariate Odds ratio.

CI 95%: 3.13–6.34) respecting the reference values for both variables. The complete results are shown in [Table 3](#).

### Physical diseases and depression

Given the importance of physical health for depression, the frequency of depression was evaluated for different diseases. The most common ones were hypertension, cholesterol, rheumatoid arthritis, diabetes, osteoarthritis and myocardial infarct.

Depression was more frequent in those participants with emotional disorders, Alzheimer's, Parkinson's, hip fracture and osteoarthritis. 20.3% of the sample had no relevant disease, and this was a protective factor against depression (OR = −0.20; CI 95%: 0.17–0.22) ([Table 4](#)).

### Differences between countries

The total amount of depression in the sample was compared according to countries. This gave three groups of countries:

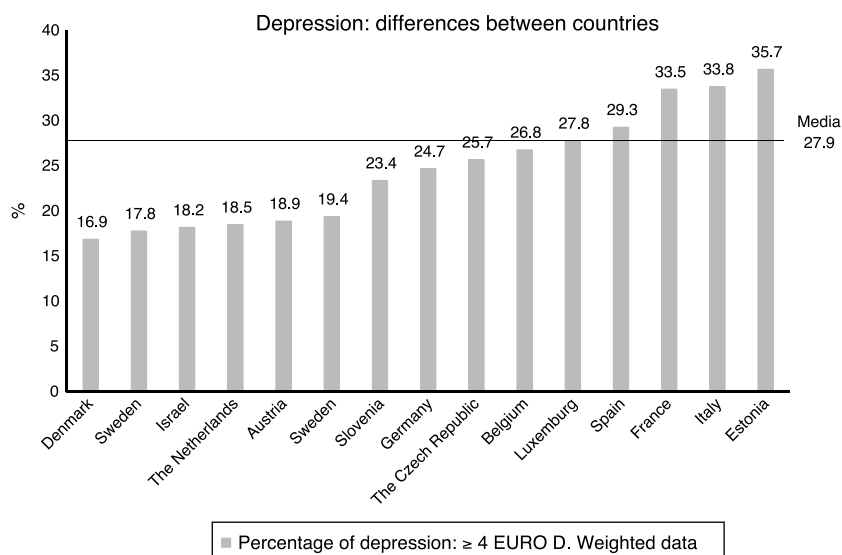
**Table 4** Frequency of disease and association with depression.

	Frequency of disease	Euro-D $\geq 4$	OR (CI 95%)	Differences		
	%	%		$\chi^2$	<i>p</i>	<i>V</i>
<i>Disease</i>						
Emotional disorders	7.2	73.9	8.23 (6.57–10.32)	442.8	<0.001	0.27
Alzheimer's	1.9	76.4	8.22 (5.27–12.81)	121.2	<0.001	0.14
Parkinson's	1.0	57.4	3.32 (1.99–5.54)	23.8	<0.001	0.06
Hip/femur fracture	1.9	55.4	3.09 (2.12–4.51)	38.1	<0.001	0.08
Osteoarthritis	10.2	50.1	2.85 (2.40–3.39)	152.7	<0.001	0.16
Rheumatoid arthritis	16.8	48.6	2.80 (2.43–3.23)	215.5	<0.001	0.19
Cerebral vascular accident	2.1	49.6	2.44 (1.71–3.50)	25.5	<0.001	0.06
Stomach ulcer	3.7	48.4	2.36 (1.80–3.10)	40.5	<0.001	0.08
Other fractures	5.8	46.9	2.26 (1.81–2.83)	54.7	<0.001	0.09
Cataracts	9.0	46.0	2.25 (1.87–2.70)	79.9	<0.001	0.11
Chronic lung disease	5.7	46.7	2.24 (1.79–2.81)	53.1	<0.001	0.09
Heart attack	10.3	45.5	2.22 (1.87–2.64)	86.5	<0.001	0.12
Diabetes	15.3	43.7	2.15 (1.86–2.49)	108.4	<0.001	0.13
Cancer	4.7	44.0	1.98 (1.55–2.53)	30.9	<0.001	0.07
Hypertension	38.0	36.1	1.70 (1.52–1.91)	83.5	<0.001	0.12
Cholesterol	28.9	36.8	1.65 (1.46–1.86)	67.0	<0.001	0.10
Others	21.7	36.6	1.55 (1.36–1.77)	43.8	<0.001	0.08
<i>No disease</i>	20.3	9.7	−0.20 (0.17–0.22)	269.9	<0.001	0.21

The values where  $p < 0.05$  are shown in bold type.

Odds ratio=1.00. The reference for each disease is not to have the specific disease, except in the final category (ref: having any disease).

EURO-D: depression scale (<4 EURO-D: no depression;  $\geq 4$  EURO-D: depression); CI: confidence of interval; OR: crude Odds ratio; *v*: Cramer's *V*;  $\chi^2$ : Chi-squared.

**Figure 1** Differences in depression between countries.

(1) those with a percentage of depression at 20% or lower (Denmark, Switzerland, Israel, the Netherlands, Austria and Sweden); (2) those with percentages from 20 to 30% (Slovenia, Germany, The Czech Republic, Belgium, Luxemburg and Spain), and (3) those countries with rates higher than 30% (France, Italy and Estonia). Spain, which is in the second

group, had a percentage of depression (29.3%) higher than the European average (27.9%) (Fig. 1).

Unlike the other countries in SHARE, Spain has a lower level of education (<9 years: 56.0% vs. 27.2%), worse perceived health (40.8% vs. 35.6%), more economic problems in reaching the end of the month (48.1% vs. 32.5%),

**Table 5** Comparison between Europe and Spain. Depression ( $\geq 4$  EURO-D).

	Europe (n = 54,688)			Spain (n = 5830)			$\chi^2$	p
	%	OR	CI 95%	%	OR	CI 95%		
<b>Age</b>								
<60 years old	24.5	1.00		21.5	1.00		6.7	<b>0.009</b>
61–70 years old	21.6	0.80	(0.80–0.89)	24.8	1.20	(1.02–1.41)	11.5	<b>0.001</b>
71–80 years old	27.9	1.19	(1.13–1.25)	32.3	1.73	(1.47–2.05)	11.9	<b>0.001</b>
$\geq 80$ years old	38.1	1.89	(1.77–2.02)	47.7	3.33	(2.78–4.00)	28.5	<b>&lt;0.001</b>
	$\chi^2 = 687.3$ ; $p < 0.001$ ; $V = 0.11$			$\chi^2 = 209.7$ ; $p < 0.001$ ; $V = 0.19$				
<b>Sex</b>								
Male	18.4	1.00		19.8	1.00		3.0	0.082
Female	31.2	2.00	(1.92–2.09)	37.1	2.39	(2.12–2.69)	46.3	<b>&lt;0.001</b>
	$\chi^2 = 1.156.0$ ; $p < 0.001$ ; $V = 0.14$			$\chi^2 = 211.4$ ; $p < 0.001$ ; $V = 0.19$				
<b>Marital status</b>								
Single	27.2	1.00		25.0	1.00		0.6	0.411
Married	22.5	0.77	(0.71–0.84)	25.6	1.03	(0.78–1.35)	21.8	<b>&lt;0.001</b>
Divorced	30.1	1.15	(1.04–1.26)	35.1	1.62	(1.10–2.38)	2.5	0.110
Widowed	37.3	1.58	(1.44–1.74)	52.0	3.25	(2.40–4.41)	58.0	<b>&lt;0.001</b>
	$\chi^2 = 790.8$ ; $p < 0.001$ ; $V = 0.12$			$\chi^2 = 208.5$ ; $p < 0.001$ ; $V = 0.19$				
<b>Educational level</b>								
>12 years	20.6	1.00		17.4	1.00		7.8	<b>0.005</b>
9–12 years	25.8	1.33	(1.27–1.40)	25.1	1.59	(1.31–1.92)	0.2	0.610
6–8 years	33.1	1.90	(1.79–2.01)	29.9	2.01	(1.68–2.41)	6.3	<b>0.012</b>
0–5 years	31.9	1.80	(1.68–1.93)	42.8	3.55	(2.96–4.24)	54.3	<b>&lt;0.001</b>
	$\chi^2 = 607.9$ ; $p < 0.001$ ; $V = 0.10$			$\chi^2 = 217.0$ ; $p < 0.001$ ; $V = 0.19$				
<b>Physical health</b>								
Very good	9.4	1.00		8.9	1.00		0.2	0.613
Good	18.1	2.13	(2.00–2.28)	16.3	1.97	(1.57–2.49)	5.0	<b>0.025</b>
Mediocre	37.9	5.89	(5.52–6.28)	41.9	7.35	(5.86–9.21)	10.0	<b>0.002</b>
Poor	66.3	18.96	(17.50–20.54)	73.2	27.90	(21.48–36.24)	14.0	<b>&lt;0.001</b>
	$\chi^2 = 8.233.2$ ; $p < 0.001$ ; $V = 0.38$			$\chi^2 = 1.225.8$ ; $p < 0.001$ ; $V = 0.45$				
<b>Household unit</b>								
$\geq 3$ people	24.5	1.00		26.3	1.00		2.8	0.092
2 people	23.0	0.92	(0.87–0.96)	27.0	1.03	(0.91–1.17)	25.1	<b>&lt;0.001</b>
Alone	33.1	1.52	(1.43–1.61)	44.5	2.24	(1.88–2.66)	42.2	<b>&lt;0.001</b>
	$\chi^2 = 478.6$ ; $p < 0.001$ ; $V = 0.09$			$\chi^2 = 102.9$ ; $p < 0.001$ ; $V = 0.13$				
<b>ELA difficulties</b>								
None	20.8	1.00		23.0	1.00		13.5	<b>&lt;0.001</b>
1–2	49.6	3.73	(3.51–3.96)	64.0	5.93	(4.80–7.33)	31.8	<b>&lt;0.001</b>
$\geq 2$	68.0	8.08	(7.41–8.81)	79.4	12.85	(9.75–16.95)	17.5	<b>&lt;0.001</b>
	$\chi^2 = 4.412.7$ ; $p < 0.001$ ; $V = 0.28$			$\chi^2 = 733.3$ ; $p < 0.001$ ; $V = 0.35$				

Values where  $p < 0.05$  are shown in bold type.

ELA: everyday life activities; EURO-D: depression scale (depression:  $\geq 4$  EURO-D); CI: confidence of interval; OR: crude Odds ratio; V: Cramer's V;  $\chi^2$ : Chi-squared (contrast between categorical variables).

lower pensions for individuals  $\geq 65$  years old (64.6% vs. 90.1%), the performance of fewer activities (64.8% vs. 85.5%) and less physical exercise (43.9% vs. 57.3%). Nevertheless, according to WHO data<sup>39</sup> it has a lower rate of successful suicides in the 50–69 year old age group (9.6% vs. 20.0%) and in those  $\geq 70$  years old (13.9% vs. 22.0%).

When the frequency of depression in Spain and other European countries is compared, the presence of depression at the levels of all the variables was found to follow the same sequence, although percentages in the Spanish

sample were higher. Most especially a low educational level (0–5 years), female sex, widowhood, living alone and older age were associated in the Spanish sample with a higher risk of depression (OR). The complete results are shown in [Table 5](#).

## Discussion

This study supplies updated data for a broad sample of individuals aged over 50 years old who are not institutionalised



and live in Spain, for the variables associated with depression.

Previous studies show that the association between depression and functional disablement is more important than the link between depression and the perception of poor physical health.<sup>16,17</sup> It is the existence of chronic diseases which cause and maintain functional disablement and the difficulty in performing ELA,<sup>18,19</sup> as we found in the analysis of the frequency of depression and diseases in this study.

Depression increases with increasing age, and this factor is associated with an increase in chronic diseases and ELA deficits. These results are supported by other studies.<sup>12</sup> Nevertheless, age is a controversial variable as some authors justify the lower rate of depression in older individuals by emphasising the psychological protection shown by older individuals as opposed to younger ones, which is due to their greater capacity for adaptation together with their wisdom and experience.<sup>40</sup>

It should be underlined that women suffer a higher rate of depression in association with higher percentages of widowhood, living alone and social isolation. Some authors observe that depression in women is accompanied by greater somatic symptoms. This is associated with their traditional family-centred role, greater emotional expressiveness and amplification of feelings.<sup>13,14</sup>

A lower educational level is associated with depression due to an increased number of chronic diseases. This is probably due to less care for their own health and a lower income. The relationship between a lower educational level and depression has been documented in several studies.<sup>6,28</sup>

Solitude increases the risk of depression<sup>23</sup> and it is associated with poorer perceived mental health and lower self-esteem.<sup>24</sup> Data in our study show greater depression in individuals who are widowed and live alone. The risk of depression is higher in individuals who are not married than it is for those who are divorced or widowed, and this may be attributed to social isolation, a reaction to internal unsatisfied needs,<sup>15</sup> and/or a lack of interpersonal support.<sup>12</sup> Previous studies hypothesise that a good emotional relationship protects against depression in the elderly, together with better performance in ELA, increased longevity and better perceived physical health.<sup>20,21</sup>

Active individuals suffer depression less often than those who are unemployed or disabled. These results are similar to those of other authors,<sup>15,26</sup> who state that ceasing work increases the frequency of depression by up to two times, above all in cases of involuntary retirement. However, some studies show that retirement at the legal age considerably reduces the risk of suffering health problems, without its being associated with greater depression or poor cognitive function.<sup>27</sup>

Physical exercise and activities had a protective effect against depression. Undertaking activities favours the maintenance of cognitive performance and also reduces possible social isolation when interactive activities are carried out,<sup>25</sup> as satisfaction with life increases.<sup>30</sup> On the other hand, doing physical exercise has also been shown to improve well-being, leading to the perception of a higher quality of life.<sup>7,22</sup>

In comparison with the other countries that took part in the study, the results in Spain for depression are similar to the findings of other authors, as they too observe a higher prevalence in Italy, France and Spain. Castro-Costa

et al.<sup>41</sup> explain this increased prevalence by referring to factors resulting from factorial analysis of the EURO-D scale (suffering and motivation), underlining the higher impact of the 'motivation' factor in these cases (pessimism, reduced interest, problems with concentration and loss of the capacity for enjoyment), as well as other aspects such as economic problems.

The lower suicide rate in Spain also has to be mentioned, even though the country has a more precarious welfare state and worse socio-economic indicators (less education, poorer perception of health, economic difficulties and lower pensions, etc.) than other European countries. Wu et al.<sup>42</sup> refer to the stronger family system in southern European countries as the best protection against self-destructive behaviour.

## Limitations and future lines of research

An important limitation of this study was the data-gathering procedure of SHARE itself, which was based on participants' own perceptions of their condition. For aspects such as difficulties with ELA and physical health, it would be useful to have a third-party opinion that would make it possible to establish an objective viewpoint and evaluate possible discrepancies.

On the other hand, cognitive aspects were not taken into account in this paper, in spite of the fact that cognitive performance influences and conditions the possible presence of depressive symptoms and vice versa.

An especially important area to be explored in future research would be suicidal behaviour and its associated factors, given that the differences in the rates among European countries are very notable.

## Conclusions

The variables associated with depression were chiefly poor physical health, difficulties in ELA and female sex. The diseases associated with the highest rates of depression were those which are neurodegenerative (Alzheimer's and Parkinson's), hip fracture, rheumatism and cerebral vascular accidents, all of which increase functional disablement.

Widowhood, not performing activities and a low educational level are also more closely associated with the presence of depression.

Given the depressive tendency associated with the decline of physical health, it would be necessary to improve adaptation to a reality that arises with age,<sup>17-19</sup> improving self-perception and increasing self-care for health together with relationships and enjoyable social activities.

## Ethical responsibilities

### The protection of persons and animals

The authors declare that no experiments were performed on human beings or animals for this research.

**Data confidentiality.** The authors declare that they followed the protocols of their centre of work regarding the publication of patient data.

## The right to privacy and informed consent

The authors obtained the informed consent of the patients and/or subjects referred to in the paper. The corresponding author holds this document.

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## Conflict of interests

The authors have no conflict of interests to declare.

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