Gender differences in the impact of mental disorders and chronic physical conditions on health-related quality of life among non-demented primary care elderly patients

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Abstract

Purpose This paper aims to estimate the comorbidity of mental disorders and chronic physical conditions and to describe the impact of these conditions on health-related quality of life (HRQoL) in a sample of older primary care (PC) attendees by gender.

Methods Cross-sectional survey, conducted in 77 PC centres in Catalonia (Spain) on 1192 patients over 65 years old. Using face-to-face interviews, we assessed HRQoL (SF–12), mental disorders (SCID and MINI structured clinical interviews), chronic physical conditions (checklist), and disability (Sheehan disability scale). We used multivariate quantile regressions to model which factors were associated with the physical component summary—short form 12 and mental component summary—short form 12.

Result The most frequent comorbidity in both men and women was mood disorder with chronic pain and arthrosis.

Mental disorders mainly affected 'mental' QoL, while physical disorders affected 'physical' QoL. Mental disorders had a greater impact on HRQoL than chronic physical conditions, with mood and adjustment disorders being the most disabling conditions. There were some gender differences in the impact of mental and chronic physical conditions on HRQoL. Anxiety disorders and pain had an impact on HRQoL but only in women. Respiratory diseases had an effect on the MCS in women, but only affected the PCS in men.

Conclusions Mood and adjustment disorders had the greatest impact on HRQoL. The impact profile of mental and chronic physical conditions differs between genders. Our results reinforce the need for screening for mental disorders (mainly depression) in older patients in PC.

Keywords Aged · Aged 80 and over · Health-related quality of life · Primary care · Mental disorders · Chronic physical conditions · Non-demented

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Introduction

In recent decades, health care has undergone a paradigm shift from a paternalistic view focused on medical care and biological outcomes to a person-centred approach that takes into account the autonomy and values of patients [1] [2]. Health care is also faced with an ageing population with highly complex needs due to multimorbidity and associated disabilities. In this scenario, the main aim of health care for older adults is to improve their quality of life and well-being.

Health-related quality of life (HRQoL) is a subjective outcome measure commonly used to evaluate the impact of mental disorders and physical conditions. It provides a

multidimensional perspective encompassing a patient's emotional, physical, and social functioning. Assessment of HRQoL in research and practice can bring considerable benefits, from individual treatment decisions to health policy regulations on a national and international level. Lower HRQoL has been related to multimorbidity [3] and increased service utilisation [4]. Moreover, changes in HRQoL predict mortality in older adults [5].

Several studies have found that women have poorer HRQoL than men, but it is still unclear to what extent these differences could be attributed to social and biological factors. There is also contradictory evidence regarding the magnitude and direction of gender differences [6–8].

This paper focuses on a sample of older primary care attendees stratified by gender and aims to: (1) estimate the comorbidity of mental disorders and chronic physical conditions and (2) describe the impact of these conditions on HRQoL.

Methodology

Participants and setting

The present study is a part of a larger project investigating the prevalence of mental disorders in Catalonia (DAS-MAP) [9].

Catalonia is an autonomous community in the north-east of Spain that covers an area of 32,114 km^2 and had an official population of 7134,697 inhabitants in 2006. The study was a face-to-face, cross-sectional survey of a representative sample of adult attendees (18 years or older) at primary care health centres in Catalonia. As a consequence of a devolution process started in 1981, the 17 autonomous communities that comprise Spain have full governance in health and social care. Health care and social care for people with severe disabilities are publicly financed, and near-universal coverage is provided. The features of this system have been explained elsewhere [9].

A stratified multistage probability sample without replacement of adult consultees (18 years or older) in PC was drawn. Replacement was prohibited to ensure that every individual had a known probability of selection. The sampling frame was all health regions in Catalonia. Stage 1 was the selection of PC centres. The number of PC centres selected in each region was proportional to the population of the region. However, to have a minimum set of interviews, even in the smaller regions, at least six PC centres were chosen per region. The probability of selection depended on the population of the catchment area covered by the centre. Eighty centres were selected, and two declined to participate (97.5 % acceptance rate). In stage 2, all general practitioners (GPs) at the health centres were

invited to participate. A total of 618 accepted (68 %). Stage 3 consisted of the random selection of patients who had an appointment with each of the participating GPs.

A total of 5042 patients were randomly selected. Of these, 654 (12.1 %) did not keep the appointment with their respective GP, 764 (16.1 %) declined to participate, and 164 (3.5 %) were excluded because they showed cognitive impairment severe enough to preclude an adequate interview. The weighted response rate was 80.5 %, leaving a study sample of 3820 participants from 78 PC centres. One of the PC centres was excluded from the statistical analysis because of data loss. Therefore, the analysed sample consisted of 3815 patients (70.62 % of the attendees contacted).

We focused on the subsample of elderly people (over 65 years), a total of 1192 patients (31.20 % of the total sample). Mean age was 74 (SE = 0. 25). Females represented 57.36 % of the sample. Only 22.09 % of these participants lived alone.

Study measures

Socio-demographic questionnaire

We collected information on: gender, age, marital status, employment status, educational level, place of birth, and main reason for consultation (physical, mental/emotional, other).

Health-related quality of life (HRQoL)

HRQoL was assessed using the Spanish version 2.0 of the SF-12 [10]. The SF-12 is a valid, reliable, and widely used instrument for the assessment of HRQoL. We obtained two measures from the SF-12: a physical component summary (PCS-SF-12), indicating physical quality of life, and a mental component summary (MCS-SF-12) covering mental quality of life. Each scale uses all 12 items but with different weights. The PCS-12 and MCS-12 were scored using norm-based methods.

The SF-12 is standardised with a mean of 50 and a standard deviation (SD) of 10 in the population in Spain. It is accepted that differences <0.2 SD are considered small, around 0.5 SD are considered moderate, and 0.8 and over are considered large [11]. Hence, we have only considered those results where the B coefficient showed an impact of ±2 points and it was statistically significant.

Mental disorders

Mental disorders were assessed with the Spanish versions of the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I-RV) (major depressive episode,

dysthymic disorder, anxiety disorder modules, and adjustment disorders excluding obsessive–compulsive disorder) and the Mini-international neuropsychiatric interview (MINI; manic/hypomanic episodes, obsessive–compulsive disorder, substance and alcohol use disorders, anorexia nervosa, and bulimia nervosa) [12, 13]. Both instruments allow diagnoses according to DSM-IV criteria.

Chronic physical conditions

Chronic physical conditions were assessed using a checklist that included: allergies, arthrosis or rheumatism, asthma, bronchitis, constipation, diabetes mellitus, heart disease, heart attack, high blood pressure, migraines or frequent headaches, neck or back pain, and digestive ulcer. Similar conditions, or conditions with similar risk factors, were grouped together (i.e. chronic pain includes chronic back pain, chronic neck pain, and migraines or frequent headaches; cardiovascular disease includes heart attack and heart disease; respiratory conditions include asthma and bronchitis). We only considered the most frequent conditions in the analysis.

Disability

Disability was assessed through the Sheehan disability scale (SDS) [14]. The SDS measures the severity of disability in three interrelated domains (items): work, family life/home responsibilities, and social/leisure activities. The patient has to rate the extent to which each domain has been impaired by his/her symptoms during the previous month using a 10-point Likert scale (0 = 'not at all impaired', 5 = 'moderately impaired', 10 = 'very severely impaired'). It uses spatio-visual, numeric, and verbal descriptive anchors simultaneously. A total score ranging from 0 (unimpaired) to 30 (highly impaired) is obtained. The SDS includes two optional ratings of perceived stress (0–10) and perceived social support (0–100) that we also included in our analysis.

Procedure

Data were collected between October 2005 and March 2006 using a paper-and-pencil, face-to-face interview. Following a visit to a GP, patients were evaluated at the PC centres after providing written informed consent. A group of 20 trained clinical psychologists evaluated participants. All interviewers were trained by one of the study investigators during a 2-day course. Ethical approval was obtained from the Sant Joan de Déu Foundation Ethics Board.

Statistical analysis

We report the frequency of chronic physical conditions as well as PCS-SF-12 and MCS-SF-12 means among participants with and without 12-month mental disorders. The results (frequencies and means) were weighted to account for the varying probability of selection, given the stratified sampling. After testing the normality of PCS-SF-12 and MCS-SF-12 variables, we found that both showed right-skewed distributions, so we decided to use a nonparametric approach. We used the Kruskal–Wallis rank test to assess whether there were differences in the PCS-SF-12 and MCS-SF-12 scores for those with distinct chronic and mental conditions. We used multivariate quantile regressions to model which factors were associated with the PCS-SF-12 and MCS-SF-12. The main difference between a linear regression model and the quantile regression is that the former is based on the conditional *mean*, while quantile regression uses either the conditional median or other quantiles of the response variable. In this case, we based the inference on the median (percentile 50). We report the estimated parameter for the effect of each chronic physical condition and mental disorder on HRQoL, adjusting for socio-demographic variables (age and living alone), perceived social support, other mental and other chronic physical conditions, all comorbidities, and disability. All the analyses are presented by gender.

All analyses were carried out using STATA 12.

Results

Men

Table 1 shows the percentage of chronic physical conditions among male primary care attendees with and without mental disorders, as well as median scores on the SF-12. There were no differences in the frequency of chronic physical conditions among men with and without mental disorders, nor was this indicated by the PCS-SF-12 scores. On the other hand, MCS-SF-12 scores were lower in those with any mental disorder in all chronic physical groups except respiratory disease.

Table 2 presents the results of multivariate analysis, showing the effect of each chronic physical condition on HRQoL, adjusted for socio-demographic factors (age and living alone), perceived social support, comorbid mental disorders, other chronic physical conditions, and disability in men. Arthrosis, cardiovascular, and respiratory disease had an impact on the PCS-SF-12 (with a reduction of 3.32, 2.47, and 3.11 points, respectively) after full adjustment. The impact of chronic pain on PCS-SF-12 scores disappeared after the adjustment for all relevant covariates.

Table 1 Frequency of chronic physical conditions among primary care men attendees with mental disorder conditions and median scores on the SF-12

	Arthrosis		Cardiovascular disease		Respiratory disease		Chronic pain	
No mental disorder (n = 456)								
% (95% CI)	52.02 (46.31–57.67)		28.8 (24.70–33.28)		26.36 (22.59–30.51)		44.75 (39.04–50.59)	
PCS-12	44.28		45.35		44.13		46.59	
MCS-12	56.43		56.44		55.97		50.35	
Any mental disorder (n = 50)								
% (95% CI)	56.6 (40.37–71.53)		32.29 (20.51–46.84)		17.20 (8.55–31.56)		54.57 (37.25–70.84)	
PCS-12	44.98	p = 0.65	36.63	p = 0.35	36.62	p = 0.32	44.84	p = 0.90
MCS-12	48.96*	p = 0.001	47.54*	p = 0.01	53.60	p = 0.16	47.04**	p = 0.0002
Any mood disorder (n = 15)								
% (95% CI)	61.25 (36.93—81.01)		27.58 (10.06–56.46)		21.99 (7.78–48.51)		67.17 (39.06–86.73)	
PCS-12	41.33	p = 0.69	43.26	p = 0.70	34.70	p = 0.10	40.80	p = 0.10
MCS-12	42.29*	p = 0.001	33.58*	p = 0.002	31.85*	p = 0.04	35.14**	p = 0.001
Any anxiety disorder (n = 19)								
% (95% CI)	57.81 (31.37–80.42)		30.98 (12.86–57.72)		11.21 (2.77–35.88)		43.93 (24.25–65.72)	
PCS-12	47.29	p = 0.57	43.92	p = 0.57	44.92	p = 0.77	48.22	p = 0.51
MCS-12	54.28	p = 0.23	55.26	p = 0.70	53.69	p = 0.70	50.01	p = 0.10
Adjustment disorder (n = 13)								
% (95% CI)	58.43 (31.41–81.17)		49.42 (20.88–78.34)		25.81 (8.23–57.43)		63.51 (33.20–85.91)	
PCS-12	42.86	p = 0.88	31.71	p = 0.82	39.74	p = 0.08	39.74	p = 0.93
MCS-12	46.53*	p = 0.01	52.94	p = 0.50	52.17	p = 0.36	47.04**	p = 0.003
Total population (n = 506)								
% (95% CI)	52.50 (47.16–57.78)		29.16 (25.19–33.48)	p = 0.36	25.40 (21.66–29.54)		45.77 (40.33–51.33)	
PCS-12	44.24		44.51		43.11		46.37	
MCS-12	56.07		56.23		55.90		55.40	

Table 2 Effect of each chronic physical condition on HRQoL, adjusting for socio-demographics (age and living alone), perceived social support, comorbid mental disorders, and other chronic physical conditions in men

	Arthrosis (95 % CI)	Cardiovascular disease (95 % CI)	Respiratory disease (95 % CI)	Chronic pain (95 % CI)
PCS-SF-12 as dependent variable				
Condition alone	−6.59 (−8.68 to 4.51)**	−4.51 (−7.26 to 1.77)**	−5.98 (−9.06 to 2.9)**	−3.99 (−6.39 to 1.58)**
Condition adjusted for demographics	−5.61 (−7.75 to 3.49)**	−4.36 (−7.22 to 1.51)**	−5.36 (−7.82 to 2.90)**	−3.86 (−5.70 to 2.02)**
Condition adjusted for demographics and perceived social support	−5.1 (−7.49 to 2.72)**	−4.43 (−7.00 to 1.87)**	−5.68 (−8.43 to 2.93)**	−4.29 (−6.58 to 1.99)**
Condition adjusted for demographics, perceived social support, and any mental disorder	−4.65 (−6.68 to 2.62)**	−4.37 (−6,82 to 1.92)**	−5.59 (−8.48 to 2.70)**	−3.77 (−5.65 to 1.88)**
Condition adjusted for demographics, perceived social support, and other chronic physical conditions	−5.10 (−7.23 to 2.97)**	−3.69 (−5.94 to 1.45)**	−3.77 (−6.09 to 1.45)**	−1.74 (−3.89 to 0.39)
Condition adjusted for demographics, perceived social support, and all comorbidities	−4.56 (−6.54 to 2.59)**	−3.24 (−5.33 to 1.33)*	−4.16 (−6.30 to 2.02)**	−1.63 (−3.62 to 0.36)
Condition adjusted for demographics, perceived social support, all comorbidities, and disability	−3.32 (−4.92 to 1.73)**	−2.47 (−4.14 to 0.80)*	−3.11 (−4.83 to 1.38)**	−0.68 (−2.29 to 0.92)
MCS-SF-12 as dependent variable				
Condition alone	−1.39 (−2.39 to 0.39)*	0.34 (−0.80 to 1.49)	−0.14 (−1.34 to 1.05)	−0.88 (−2.09 to 0.32)
Condition adjusted for demographics	−0.40 (−0.67 to 1.48)	0.17 (−1.11 to 1.44)	0.07 (−1.35 to 1.19)	−0.68 (−1.88 to 0.51)
Condition adjusted for demographics and perceived social support	0.69 (−0.33 to 1.73)	−0.12 (−1.26 to 1.01)	0.03 (−1.18 to 1.24)	−0.81 (−2.19 to 0.56)
Condition adjusted for demographics, perceived social support, and any mental disorder	1.2 (−0.002 to 2.42)*	0.37 (−1.27 to 2.01)	−0.21 (−1.71 to 1.29)	−1.18 (−2.59 to 0.23)
Condition adjusted for demographics, perceived social support, and other chronic physical conditions	1.35 (0.062 to 2.64)*	−0.89 (−1.44 to 1.27)	0.15 (−1.25 to 1.55)	−1.32 (−2.62 to 0.21)*
Condition adjusted for demographics, perceived social support, and all comorbidities	1.42 (−0.16 to 3.01)	0.37 (−1.29 to 2.04)	−0.39 (−2.13 to 1.33)	−1.19 (−2.80 to 0.41)
Condition adjusted for demographics, perceived social support, and all comorbidities	1.76 (0.71–2.80)**	0.74 (−.36 to 1.84)	0.23 (−0.91 to 1.37)	−1.46 (−2.51 to 0.41)*

* $p < 0.05$; * $p < 0.001$; cardiovascular disease includes stroke, heart attack, and heart disease; respiratory disease includes asthma and bronchitis; chronic pain includes chronic back pain, chronic neck pain, and migraines or frequent headaches. PCS-SF-12 physical component score of the SF-12; MCS-SF-12 mental component score of the SF-12

Table 3 Effect of each mental disorder on HRQoL, adjusting for socio-demographics (age and living alone), perceived social support, chronic physical conditions, comorbid mental disorders, and disability in men

	Any mood disorder (95 % CI)	Any anxiety disorder (95 % CI)	Adjustment disorder (95 % CI)
PCS-SF-12 as dependent variable			
Condition alone	−6.95 (−11.44/−2.46)*	0.98 (−2.77/4.74)	−11.51 (−16.80/−6.29)**
Condition adjusted for demographics	−7.05 (−14.44/0.33)	0.45 (−4.83/5.73)	−9.97 (−17.15/−2.79)*
Condition adjusted for demographics and perceived social support	−7.60 (−13.45/−1.73)*	−0.43 (−5.08/4.21)	−10.52 (−16.50/−4.53)**
Condition adjusted for demographics, perceived social support, and other mental disorders	−7.52 (−13.53/−1.52)*	−0.41 (−5.51/4.69)	−10.86 (−17.51/−4.21)**
Condition adjusted for demographics, perceived social support, and chronic physical conditions	−5.81 (−10.65/−0.97)*	−0.30 (−5.79/5.18)	−1.99 (−8.37/4.39)
Condition adjusted for demographics, perceived social support, and all comorbidities	−5.93 (−11.31/−0.55)*	−0.42 (−4.61/3.77)	−2.04 (/7.83/3.73)
Condition adjusted for demographics, perceived social support, all comorbidities, and disability	0.01 (−4.55/4.57)	−0.83 (−4.31/2.64)	3.85 (−0.77/8.48)
MCS-SF-12 as dependent variable			
Condition alone	−13.56 (−16.30/−10.81)**	−2.39 (−4.52/−0.26)*	−6.31 (−9.11/−3.51)**
Condition adjusted for demographics	−13.81 (−16.86/10.77)**	−2.30 (−4.90/0.29)	−6.31 (−9.74/−2.87)**
Condition adjusted for demographics and perceived social support	−18.53 (−21.81/−15.24)**	−2.52 (−5.23/0.18)	−6.24 (−9.45/−3.02)**
Condition adjusted for demographics, perceived social support, and other mental disorder	−18.55 (−22.40/−14.69)**	−1.39 (−4.41/1.63)	−6.29 (−10.26/−2.32)*
Condition adjusted for demographics, perceived social support, and chronic physical conditions	−18.55 (−22.06/−15.04)**	−1.41 (−4.18/1.36)	−7.44 (−10.89/−4.00)**
Condition adjusted for demographics, perceived social support, and all comorbidities	−18.75 (−23.26/−14.24)**	−1.67 (−5.19/1.86)	−7.63 (−12.26/−2.99)**
Condition adjusted for demographics, perceived social support, all comorbidities, and disability	−17.05 (−20.03/−14.06)**	−1.89 (−4.20/0.42)	−5.09 (−8.15/−2.02)**

* $p < 0.05$; * $p < 0.001$; *PCS-SF-12* physical component score of the SF-12; *MCS-SF-12* mental component score of the SF-12

Table 3 shows the effect of mental illnesses on HRQoL. After full adjustment, mental disorders did not have an impact on the PCS-SF-12. Mood disorders had the greatest impact on the MCS-SF-12, with a significant reduction of 17.05 points, followed by adjustment disorders (−5.09 points) after adjustment for all relevant covariates; anxiety disorders had no impact on the MCS-SF-12 after full adjustment.

Women

Table 4 shows the percentage of chronic physical conditions among female primary care attendees with and without mental disorders, as well as median scores on the SF-12. In general, the percentage of chronic physical conditions was not higher in those with mental disorders. However, close inspection revealed that, in women with mood disorders, chronic pain was statistically significant more frequently than in women without mood disorders

(88.46 % 95 % CI (78.67–94.09) vs. 64.20 % 95 % CI (57.91–70.04)).

Similarly, no differences were found in the PCS-SF-12 scores of women with and without mental disorders. Nonetheless, women affected by arthrosis or chronic pain had lower PCS-12 scores if they also had mood disorders.

Women with any mental disorder had statistically lower MCS-SF-12 scores in all chronic physical conditions than those without any mental disorder. Table 5 shows that arthrosis, cardiovascular, and chronic pain had an impact on the PCS-SF-12 (with a reduction of 3.06, 3.38, and 3.79 points, respectively) after full adjustment. Respiratory disease and chronic pain were the chronic physical diseases associated with significant reduction on the MCS-SF-12 (2.16 and 2.01, respectively) after full adjustment.

Table 6 shows that the impact of mental disorders on the PCS-SF-12 fails to reach significance after adjustment for demographics, perceived social support, all comorbidities, and disability. Mood disorders and adjustment disorders had the greatest impact on the MCS-SF-12 with a

Table 4 Frequency of chronic physical conditions among primary care women attendees with mental disorder conditions and median scores on the SF-12

	Arthrosis	p	Cardiovascular disease	p	Respiratory disease	p	Chronic pain	p
No mental disorder (n = 535)								
% (95% CI)	78.00 (73.73–81.75)		23.16 (19.32–27.50)		14.64 (11.84–17.97)		64.20 (57.91–70.04)	
PCS-12	41.08		37.14		39.98		40.74	
MCS-12	53.61		53.89		51.64		52.66	
Any mental disorder (n = 151)								
% (95% CI)	80.45 (73.26–86.07)		30.72 (24.76–37.41)		11.33 (7.72–16.34)		74.63 (65.29–82.14)	
PCS-12	37.56	p = 0.30	35.76	p = 0.52	37.84	p = 0.95	36.85	p = 0.22
MCS-12	41.49**	p = 0.001	43.05**	p = 0.001	41.14**	p = 0.004	40.84**	p = 0.0001
Any mood disorder (n = 69)								
% (95% CI)	87 (77.94–92.68)		36.20 (26.13–47.66)		12.90 (7.46–21.41)		88.46 (78.67–94.09)	
PCS-12	35.26*	p = 0.03	31.83	p = 0.10	33.26	p = 0.36	33.77*	p = 0.01
MCS-12	31.90**	p = 0.001	32.46**	p = 0.001	27.59**	p = 0.002	31.72**	p = 0.0001
Any anxiety disorder (n = 82)								
% (95% CI)	75.60 (66.02–83.17)		30.45 (22.57–39.67)		7.20 (3.14–15.64)		70.51 (59.16–79.79)	
PCS	38.52	p = 0.23	34.61	p = 0.47	45.97	p = 0.17	37.04	p = 0.36
MCS	46.19**	p = 0.001	49.69	p = 0.06	45.23	p = 0.27	46.19**	p = 0.0005
Adjustment disorder (n = 17)								
% (95% CI)	79.36 (52.82–92.96)		27.11 (10.71–53.56)		21.14 (7.02–48.76)		37.52 (15.31–66.61)	
PCS-12	47.61	p = 0.08	35.75	p = 0.83	35.51	p = 0.85	43.56	p = 0.29
MCS-12	41.72**	p = 0.001	45.18	p = 0.22	41.49	p = 0.24	44.72	p = 0.25
Total (n = 686)								
% (95% CI)	78.57 (74.77–81.93)		24.91 (21.59–28.54)		13.88 (11.48–16.68)		66.61 (61.23–71.58)	
PCS-12	40.86		36.30		39.9		39.88	
MCS-12	52.17		50.67		49.85		50.82	

Table 5 Effect of each chronic physical condition on HRQoL, adjusting for socio-demographics (age and living alone), perceived social support, comorbid mental disorders, and other chronic physical conditions in women

	Arthrosis (95 % CI)	Cardiovascular disease (95 % CI)	Respiratory disease (95 % CI)	Chronic pain (95 % CI)
PCS–SF-12 as dependent variable				
Condition alone	−9.24 (−13.51 to 4.97)**	−7.51 (−10.80 to 4.21)**	−2.65 (−6.84 to 1.55)	−8.41 (−11.76 to 5.06)**
Condition adjusted for demographics	−9.82 (−12.72 to 6.9)**	−8.09 (−11.52 to 4.67)**	−3.31 (−7.90–1.27)	−9.26 (−12.04 to 6.47)**
Condition adjusted for demographics and perceived social support	−9.92 (−13.46 to 6.39)**	−8.67 (−12.43 to 4.90)**	−3.32 (−8.21 to 1.57)	−9.67 (−12.33 to 7.02)**
Condition adjusted for demographics, perceived social support, and any mental disorder	−9.17 (−12.49 to 5.85)**	−7.02 (−11.05 to 2.99)**	−3.35 (−8.05 to 1.34)	−9.07 (−11.81 to 6.35)**
Condition adjusted for demographics, perceived social support, and other chronic physical conditions	−6.62 (−8.91 to 3.49)**	−6.24 (−8.71 to 3.76)**	−2.99 (−6.00 to 0.02)	−5.67 (−8.07 to 3.28)**
Condition adjusted for demographics, perceived social support, and all comorbidities	−5.75 (−8.79 to 2.71)**	−5.58 (−8.36 to 2.81)**	−3.63 (−7.05 to 0.22)*	−5.10 (−7.82 to 2.38)**
Condition adjusted for demographics, perceived social support, all comorbidities, and disability	−3.06 (−5.54 to 0.58)*	−3.38 (−5.64 to 1.11)*	−1.15 (−3.90 to 1.59)	−3.72 (−5.94 to 1.50)**
MCS-SF-12 as dependent variable				
Condition alone	−1.39 (−2.39 to 0.39)	−1.89 (−4.09 to 0.30)	−2.71 (−5.38 to 0.04)*	−3.33 (−5.01- to 1.66)**
Condition adjusted for demographics	−0.28 (−2.60 to 2.04)	−2.47 (−4.36 to 0.57)*	−2.34 (−5.32 to 0.62)	−3.55 (−5.39 to 1.72)**
Condition adjusted for demographics and perceived social support	−0.76 (−3.19 to 1.67)	−1.59 (−3.34 to 0.16)	−2.21 (−4.67 to 0.25)	−3.02 (−4.97 to 1.07)*
Condition adjusted for demographics, perceived social support, and any mental disorder	−0.02 (−2.13 to 2.08)	1.03 (−0.58 to 2.64)	−1.41 (−3.99 to 1.16)	−2.11 (−3.87 to 0.35)*
Condition adjusted for demographics, perceived social support, and other chronic physical conditions	0.89 (−1.58 to 3.37)	−0.78 (−3.04 to 1.48)	−1.87 (−4.65 to 0.91)	−3.68 (−5.88 to 1.48)**
Condition adjusted for demographics, perceived social support, and all comorbidities	0.29 (−1.50 to 2.08)	1.09 (−0.53 to 2.72)	−2.26 (−4.26 to 0.25)*	−2.46 (−4.06 to 0.85)*
Condition adjusted for demographics, perceived social support, all comorbidities, and disability	0.68 (−1.18–2.56)	1.92 (0.19–3.64)*	−2.16 (−4.26 to 0.05)*	−2.01 (−3.69 to 0.32)*

* $p < 0.05$; * $p < 0.001$; cardiovascular disease includes stroke, heart attack, and heart disease; respiratory disease includes asthma and bronchitis; chronic pain includes chronic back pain, chronic neck pain, and migraines or frequent headaches. PCS-SF-12 physical component score of the SF-12; MCS-SF-12 mental component score of the SF-12

Table 6 Effect of each mental disorder on HRQoL, adjusting for socio-demographics (age and living alone), perceived social support, chronic physical conditions, comorbid mental disorders, and disability in women

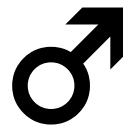|	Any mood disorder (95 % CI)	Any anxiety disorder (95 % CI)	Adjustment disorder (95 % CI)
PCS-SF-12 as dependent variable			
Condition alone	−7.49 (−11.95/−3.02)**	−1.23 (−5.38/2.38)	4.04 (−4.22/12.30)
Condition adjusted for demographics	−7.83 (−12.51/−3.09)**	−1.66 (−6.53/3.20)	2.54 (−7.31/12.39)
Condition adjusted for demographics and perceived social support	−8.59 (−13.41/−3.78)**	−2.66 (−7.74/2.4)	2.44 (−8.99/13.86)
Condition adjusted for demographics, perceived social support, and other mental disorders	−8.08 (−13.18/−2.98)*	−2.01 (−6.44/2.43)	1.96 (−7.63/11.56)
Condition adjusted for demographics, perceived social support, and chronic physical conditions	−3.61 (−7.41/0.19)	−0.47 (−3.56/2.61)	0.51 (−6.24/7.26)
Condition adjusted for demographics, perceived social support, and all comorbidities	−3.61 (−7.62/0.39)	0.34 (−3.77/3.08)	0.68 (−6.78/8.15)
Condition adjusted for demographics, perceived social support, all comorbidities, and disability	2.83 (−0.5/6.1)	0.41 (−2.38/3.20)	0.93 (−5.11/6.97)
MCS-SF-12 as dependent variable			
Condition alone	−21.52 (−24.13/−18.89)**	−4.63 (−7.12/−2.15)**	−10.79 (−16.16/−5.40)**
Condition adjusted for demographics	−22.85 (−25.47/−20.24)**	−4.49 (−6.95/−2.02)**	−9.87 (−15.30/−4.45)**
Condition adjusted for demographics and perceived social support	−19.10 (−21.50/−16.71)**	−4.79 (−6.79/−2.79)**	−11.89 (−16.62/−7.16)**
Condition adjusted for demographics, perceived social support, and other mental disorder	−17.04 (−19.89/−14.19)**	−4.22 (−6.66/−1.77)**	−12.27 (−17.58/−6.95)**
Condition adjusted for demographics, perceived social support, and chronic physical conditions	−18.83 (−21.41/−16.25)**	−4.53 (−6.92/−2.14)**	−11.56 (−17.64/−5.47)**
Condition adjusted for demographics, perceived social support, and all comorbidities	−16.365 (−18.71/−14.01)**	−3.76 (−5.75/−1.77)**	−13.604 (−17.98/−9.22)**
Condition adjusted for demographics, perceived social support, all comorbidities, and disability	−16.59 (−19.14/14.04)**	−2.61 (−4.74/−0.49)*	−12.35 (−16.83/−7.86)**

* $p < 0.05$; * $p < 0.001$; PCS-SF-12 physical component score of the SF-12; MCS-SF-12 mental component score of the SF-12

Fig. 1 Impact of chronic physical conditions and mental disorders on the HRQoL: summary

Impact of Chronic Physical Conditions and Mental Disorders on the HRQoL: summary

PHYSICAL COMPONENT — MENTAL COMPONENT

Arthrosis, Cardiovascular, Respiratory / Adjustment disorder, ANY MOOD DISORDER

Arthrosis, Cardiovascular, Chronic Pain / Chronic Pain, Respiratory, Anxiety disorder, ADJUSTMENT DISORDER, ANY MOOD DISORDER

Results adjusted by age and living situation, perceived social support, other comorbidities and disability.

significant reduction of 16.59 and 12.35, respectively, after adjustment for demographics, perceived social support, all comorbidities, and disability.

Discussion

Summary of main results

Results show that, in a sample of older primary care patients, any mood disorder with chronic pain and arthrosis was the most frequent comorbidity in both women and men. However, the worst HRQoL scores were found in those patients with comorbid mood disorders and respiratory diseases. In general, the impact of mental disorders on HRQoL was greater than the impact of chronic physical conditions, with mood disorders as the most disabling condition. As expected, the impact of mental versus physical disorders on quality of life was rather specific, with mental disorders affecting 'mental' quality of life and physical disorders mainly affecting 'physical' quality of life. However, respiratory disease in women mainly affected the MCS, and chronic pain, in women, affected both HRQoL components. Importantly, this study reveals that the impact of mental disorders and chronic physical conditions on older primary care patients differs slightly according to gender. In men, anxiety disorders had no impact on HRQoL, while they did have a mild effect on women. Similarly, chronic pain had no effect on HRQoL in men, although it affected both HRQoL components in women, while respiratory disease only had an impact on the MCS in women, and on the PCS in men. Figure 1 shows this information.

Comparison with the literature

According to our data, and consistent with the literature on mixed-age samples and elderly samples, pain and mental disorders (mainly mood and anxiety disorders) [15–19] frequently co-occur and have negative consequences for HRQoL. This has also been related to more severe pain, greater disability, poorer neuropsychological performance, and greater health utilisation [15, 20, 21]. To the best of our knowledge, there are no studies on adjustment disorders in the elderly, but our results show a relationship indicating a worsening of mental HRQoL associated with adjustment disorders in our elderly population. Regarding cardiovascular and respiratory diseases, our results are consistent with the literature [22–24] and suggest that comorbidity with mental disorders (mainly mood disorders) is linked to poorer HRQoL.

Various studies have reported that mental disorders have more impact on HRQoL than common physical conditions [18, 25–29]. This could be due to the differential impact of physical and mental diseases on human capacities. Mental disorders affect the higher-order capacities of the human organism (emotion, motivation, and cognition) that are closely related to vitality, role function, or social functioning, some of the key components of HRQoL measures [27, 30]. Indeed, mood disorders were the specific group which had the greatest impact on HRQoL among the elderly. This is consistent with the literature on mixed-age samples [18, 27, 28, 31–33]. Our results suggest that adjustment disorders had more impact on HRQoL than anxiety disorders. We even found that anxiety disorders had no impact on HRQoL in men. Previous studies (from mixed-age and elderly samples) had shown a significant impact of anxiety disorders (panic disorders, post-traumatic stress disorder, generalised anxiety disorder, and social phobia) on HRQoL [17, 18, 27, 33, 34]. Our results may be explained by the low prevalence of anxiety disorders in our sample, with specific phobia, the most common anxiety disorder found, possibly associated with less effect on HRQoL. On the other hand, the relatively low impact of chronic physical conditions may be explained by the fact that when people have had a condition for a long time, it may alter their expectations, resulting in changes in their internal standards, values, and conceptualisation of HRQoL, referred to as 'response shift' [35].

Finally, we found mild gender differences in the impact profile of somatic conditions and mental disorders on HRQoL. To understand these differences, first we need to bear in mind that HRQoL is a subjective measure, influenced not only by disease symptoms, but also by a patient's strategies for coping with them. The authors are aware that research on gender differences in coping strategies is controversial. No consensus has been reached, and even though some approaches, such as socialisation theory, maintain that men are socialised to be more active and more instrumental problem-solvers, and women depend more on emotionally focused strategies and emotional support [36, 37], this appears to be so general as to serve little purpose. In addition, there is a strong impression that such conclusions simply reinforce gender stereotypes. Regarding emotional coping strategies, some research suggests that emotional strategies, which could be adaptive in the short term, may be maladaptive in the long term and unsuitable for chronic cases [37]. We found that chronic pain had no impact on HRQoL in men, but there was an impact on the PCS and the MCS in women; gender differences in the experience of pain, coping, and functioning have been widely reported in the population with chronic pain [38]. However, there are inconsistences. In addition to biological factors (such as hormone levels), we could explain these differences by distinct coping strategies [39]: a recent systematic review suggested that women in pain

are more likely to use maladaptive coping strategies resulting in poorer functioning [40]; and by psychosocial factors: theoretically, men are socialised to be stoic, to minimise and endure pain, and to deny any perceptions or feelings of helplessness [39, 41]. On the other hand, women have wider and numerous life roles than men that can be more affected by pain [40].

In our sample, respiratory disease had an impact on the PCS in men and on the MCS in women. Various studies have found that women with COPD have lower HRQoL than men [42–44], and some authors have found that the determinants of quality of life related to respiratory disease differ by sex [42, 44]. Moreover, women with COPD seem to report more dyspnoea than men and it has been suggested that dyspnoea has more impact on the PCS in men and on the MCS in women [45]. Thus, this could help to explain our findings. In line with our data, previous research [43–45] found that women with respiratory disease had worse MCS scores than men. This could be because the experience of dyspnoea has both sensory and affective dimensions, associated with emotional responses to sensations and higher-order interpretations of the experience, which can affect patients' physical and emotional functioning [45].

Finally, we should emphasise that we found anxiety disorders had no significant impact on HRQoL in men, but they did in women. Previous research shows mixed results, with some studies suggesting that there are no gender differences in the impact of anxiety disorders on HRQoL in the elderly [46], and others that found a greater impact of anxiety disorders on HRQoL in women [47]. To understand the gender differences found in our study, again we need to relate them to distinct coping strategies and psychosocial factors. Women's mental well-being is affected by the quality of interpersonal relationships to a greater extent that in men [48], and the arrival of old age involves learning to cope with many situations of loss (family, friends and loved ones) which may damage close interpersonal networks. We could hypothesise that this type of event could cause anxiety that would have a greater impact on women than on men.

Strengths and limitations

The study has some strengths and limitations. The main strengths are a large representative sample of elderly PC outpatients, the use of structured psychiatric interviews for the diagnosis of mental disorders, and the inclusion of disability as a covariable. However, some limitations should be mentioned. First, the study is cross-sectional; therefore, we cannot assume causality in the relationship between mental disorders or chronic physical disorders and HRQoL. Second, while mental disorders were assessed by structured psychiatric interviews, chronic physical conditions were ascertained using a checklist rather than examination by a physician. However, methodology research has shown that self-reporting of chronic physical conditions shows moderate to high agreement with medical record data [49]. Third, our checklist did not include some serious illnesses such as cancer or some neurological disorders that also have a great effect on HRQoL. However, as we focused on the more prevalent diseases, the low prevalence of these illnesses would preclude them from our analyses. Fourth, the study does not include institutionalised elderly people (probably more ill and disabled, and with a higher prevalence of mental disorders [50]), some particularly disabling psychiatric conditions such as non-affective psychotic disorders or patients with dementia. Lastly, the evaluation of HRQoL referred to the month preceding the interview, while the evaluation of mental and physical disorders covered the 12 months prior to the interview. Due to different time frames, it is not possible to definitively relate HRQoL to the underlying mental or physical health condition for the preceding 12 months. There is a distinct possibility that we underestimated the effect of mental disorder, as many episodes may have had remitted before the interview.

In spite of these limitations, we believe that this study reinforces the need for screening for mental disorders in older patients. Mood disorders had the greatest impact on HRQoL, in both men and women, affecting quality of life through limitations on the higher-order human capacities, cognition, motivation, and emotion, that affect emotional regulation, social perception, and role functioning [27]. These capacities are crucial for healthy ageing. While further research on gender differences is necessary, we would like to remark that tackling gender issues is a minefield. Concepts of gender and gender roles change over time and vary from culture to culture, social class to social class, and from rural to urban environments. Due to the overlap between genders in terms of personal characteristics, and modern acceptance that not all men or all women are the same, it may be useful to analyse coping strategies by particular traits found in individuals in addition to the focus on gender.

analysis. LB, AF, and MRV analysed the data. LB, AF, and MRV drafted the paper, and LB, AF, MRV, DJP, and ASB discussed and agreed the final version.

Compliance with ethical standards

Conflict of interest LB declares that she has no conflict of interest. MRV declares that she has no conflict of interest. ASB declares that he has no conflict of interest. DJP declares that he has no conflict of interest. AF declares that she has no conflict of interest.

Ethical approval All procedures performed in this study were in accordance with the ethical standards of the institutional research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. Ethical approval was obtained from the SJD Ethic Committee Board.

Informed consent Informed consent was obtained from all individual participants included in the study.

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