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# Self-perceived health and quality of life by activity status in community-dwelling older adults

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**Aim:** The present study aimed at analyzing whether activity status is associated with self-perceived health status and quality of life (QoL) in community-dwelling older adults.

**Methods:** We used a cross-sectional design based on a semi-structured QoL questionnaire in a representative sample of 1106 community-dwelling adults aged 60 years and older in Spain. Logistic regression models were used to explain the association of activity status with self-perceived health status and QoL, assessed by means of the EQ-5D-3L index, controlling for the influence of sociodemographic, social and support network variables, and health indicators.

**Results:** The mean age  $\pm$  standard deviation was  $72.1 \pm 7.8$  years. For the activity status, 8.5% were working people, 53.7% retirees, 30.6% homemakers and 7.2% pensioners. All homemakers and 93.6% pensioners were women. In the model to assess perceived health status, when controlling for sociodemographic, social and support network variables, we found that working people rated their health better than the retired group. In this model, pensioners rated their health status worst, whereas homemakers did not show any significant difference compared with the retired group. However, there were no differences in the model of QoL by activity status.

**Conclusion:** Activity status was associated with self-perceived health status, but not with QoL. This study draws attention to the need of considering the activity of older adults for actions aimed at maintaining and improving their health. *Geriatr Gerontol Int* 2013; ●●: ●●–●●.

**Keywords:** aged, health status, quality of life, occupational status, retirement.

## Introduction

The present aging of the population is unprecedented in the history of humanity, resulting from the transition from high to low fertility and a continuous reduction of adult mortality. While the world population is increasing at 1.2% annually, the population aged 60 years and older is growing at a rate of 2.6% per year.<sup>1</sup> As a population ages, the potential support ratio (those aged  $\geq 65$  years as a proportion of those of working age) tends to fall. This reduction has important implications for

social security policies, particularly for pension programs where the taxes the current workers pay fund the pensions of retirees.<sup>1</sup>

Spain, like other developed countries, has more than one-fifth of its population aged over 60 years, and a 20-year life expectancy at the age of 65 years,<sup>2</sup> where many older adults are still able to work and contribute to society. According to the Time Usage (*Empleo del Tiempo*) survey of the National Institute of Statistics of Spain, 86.3% of older adults aged 65 years and older carry out household chores during the day, 22.5% use their time for volunteer work and informal support, and 2.1% carry out professional work.<sup>3</sup> Previous studies on quality of life (QoL) and activity status have shown that unemployment and retirement were significantly associated with lower QoL.<sup>4,5</sup> In contrast, continued employment after retirement has been correlated with

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better health, self-sufficiency and longevity in a cohort of community-dwelling older adults.<sup>6</sup> Nevertheless, the differences in health perception and QoL among economically active, retired, homemakers and pensioners have not been sufficiently studied yet. Although there are many studies about the factors that influence the self-rated health of older adults, not many have explored the influence of work status. This is particularly important in older age, where there is greater proportion of people outside the workforce, such as pensioners, retirees or homemakers. In addition, most studies on older adults and self-perceived health do not take into consideration specific groups by activity status.

In addition to activity status, there are more factors influencing self-perceived health and QoL of older adults. Psychosocial dimensions, such as social support or feelings of loneliness among others, are important determinants of QoL in old age.<sup>7-9</sup> Furthermore, social integration has a protective effect for mental and physical health outcomes, and for better recovery after disease onset in older adults.<sup>10</sup> Also, social isolation, measured as the absence of contact with other people, was significantly related to lower health status and QoL, even when age, sex, medical morbidity and employment status were accounted for.<sup>11</sup>

Understanding the factors influencing QoL in old age has important implications for future interventions aimed at improving health outcomes. The present study had two objectives: (i) to describe sociodemographic, social and support network variables, and health indicators by activity status; and (ii) to establish whether activity status is a determinant of self-perceived health and QoL. Specifically, we tested two main hypotheses: (i) working people show the best ratings in social and health indicators, and pensioners the worst, whereas retirees and homemakers are in an intermediate position; and (ii) activity status is an independent determinant of self-perceived health status and QoL. Results from the present study will help to design health interventions specifically tailored for older adults with different activity status.

## Methods

### *Study population*

The present study used a representative sample of 1106 people, selected from a total population of 9 812 307 community-dwelling people aged 60 years and over in Spain.<sup>12</sup> The sample was obtained by stratified random sampling proportional to the size of four previously defined strata.<sup>13</sup> Finally, 1090 respondents were analyzed, the activity status of 16 people was unknown. The present study was authorized by the Carlos III Health Institute Ethics Committee, and participants' consent was obtained. We followed a cross-sectional design, and

home-based questionnaires were administered through face-to-face semi-structured interviews.

### *Data collection*

Sociodemographic characteristics, retirement-related variables, social and support networks, and health indicators were studied. The sociodemographic characteristics were: sex, age in five groups (60–64 years, 65–69 years, 70–74 years, 75–79 years and  $\geq 80$  years), marital status (single, separated/divorced; married or with partner; and widowed) and educational level (less than primary education, primary and secondary or higher). Because of the high proportion of missing data in the total monthly income (30.1%), household economy indicators were used: self-perceived household economic status, satisfaction with economic resources and future economic security, with Likert-type response scales of 0–10, where high values reflect better economic level.<sup>13</sup>

All people surveyed were asked about their current activity status, and classified into four groups: working (includes both paid work and unpaid work in a family business or company), retired (withdrawal from working life due to having fulfilled the age required by law in Spain, 65 years at the study time, and receiving a retirement stipend), homemakers and pensioners. Pensioners included all individuals receiving widows', invalidity or other non-contributory pensions. This group did not include retirement pensions.

For retirement variables, information on retirement age and satisfaction with activity status (0, completely dissatisfied to 10, completely satisfied) was gathered. Retirement QoL was assessed through the question: "Would you say that with retirement quality of life improved a lot, improved a little, did not change, became a little worse or much worse?"

For social and support network variables, perceived social support was measured through the Duke-UNC Functional Social Support (DUFSS) questionnaire. The scale values ranges from 11 to 55, from low to high social support.<sup>14-17</sup> The six-item De Jong Gierveld Loneliness Scale was also used to measure social and emotional loneliness,<sup>18</sup> with scores of 0–1 indicating no loneliness, and values of 2–6 reflecting loneliness.<sup>19</sup> Finally, satisfaction with the way people use their free time was also measured (0, completely dissatisfied to 10, completely satisfied).

Five different scales were used as health and QoL indicators. For comorbidity, the number of self-reported chronic medical conditions, adapted from the Cumulative Illness Rating Scale for Geriatrics, was considered.<sup>20</sup> We also used the depression subscale of the Hospital Anxiety and Depression Scale (HADS-D), whose values range from 0 to 21. A value of 0–7 is considered normal; a probable case is 8–10; and a

clinical problem is 11 or more. A generic measurement of self-perceived health status on a scale of 1 (very poor) to 5 (very good) was also included.

Finally, to assess QoL, the EQ-5D-3L index was used, which takes values from -1 (lowest QoL) to 1 (highest QoL), based on the combination of level of problems in five health dimensions (mobility, self-care, usual activities, pain/discomfort and anxiety/depression).<sup>21</sup>

### Statistical analysis

A descriptive analysis was carried out for sociodemographic, retirement, social and support network, and health characteristics. To compare these characteristics by activity status, parametric and non-parametric hypothesis tests were carried out.

A single-factor analysis of variance (ANOVA) was applied to continuous variables that had a close-to-normal distribution (economic variables, retirement QoL, satisfaction with activity status, DUFSS scale, satisfaction with the use of free time and self-perceived health status). For HADS-D and total number of self-reported chronic medical conditions, logarithmic transformations were necessary to approximate to normal distributions before applying the ANOVA test. To control for age, the previous analyses were repeated considering age as a covariable (ANCOVA) for selected variables. For the remaining continuous variables, Kruskal-Wallis was used as a non-parametric test for independent samples.

To achieve the second objective, analyzing factors associated with good health status and good QoL while controlling for the influence of other variables, multivariate logistic regression models were carried out using a forward stepwise procedure (conditional), using self-perceived health status and the EQ-5D-3L index value as dependent variables, respectively. Self-perceived health status was grouped into two categories, taking value 1 when participants' perception of their health status was either very good or good, and value 0 if it was fair, poor or very poor. The EQ-5D-3L index value was dichotomized according to the sample median (0.8), and the scores above or below this cut-off were defined as better or worse QoL, respectively.

Partial models were first applied. First, sociodemographics (sex, age, marital status, educational level and activity status), retirement QoL, perceived social support and social network variables (loneliness scale and DUFSS scale) were analyzed without the effect of health variables. To assess the impact of the health, a second step was to add, besides the previous variables, HADS-D and the number of self-reported chronic medical conditions (complete models). Statistical analyses were carried out with SPSS15.0 software (SPSS, Chicago, IL, USA).

## Results

### *Descriptive analysis of sociodemographic, social network and health characteristics according to activity status*

When comparing the groups by activity status (Table 1), both working and retired people were mostly men, whereas the majority of pensioners and all people carrying out household tasks were women. Significant differences ( $P < 0.001$ ) were found between the groups in terms of age, marital status, educational level and other sociodemographic characteristics. The mean age  $\pm$  standard deviation ( $M \pm SD$ ) of retired people was  $73.3 \pm 7.1$  years, whereas pensioners were the oldest group ( $74.5 \pm 8.2$  years). The predominant marital status was being married or living with a partner, except for pensioners, 78.2% of whom were widowed. Working people had the highest educational level, with 53.8% having reached secondary or higher education, compared with 33.2% of retired people.

Even after adjusting for age ( $P < 0.001$ ), significant differences by activity status were found in self-perceived household economic status, satisfaction with economic resources and future economic security: working people were in the best position, followed by retirees, homemakers and, finally, pensioners.

The average retirement age of retired people was  $63 \pm 3.4$  years. Satisfaction with activity status was highest amongst working people. However, after controlling for age, retirees were the most satisfied group not only with their activity status ( $P = 0.002$ ), but also with the use of free time ( $P = 0.002$ ).

More than a half of homemakers (52.0%) and pensioners (57.7%) had some feelings of loneliness, whereas among working and retired people this percentage was lower (40.2% and 45.2% respectively;  $P = 0.028$ ). After adjusting for age, the retired people's group showed most satisfaction with their use of free time ( $P = 0.002$ ).

Statistically significant differences ( $P < 0.001$ ) were found by activity status in all health variables (Table 2), except for vision and high cholesterol problems. Two-thirds of pensioners, and more than 70% of homemakers and retired people did not suffer depression (HADS-D scale), compared with 91.4% of the working population.

Retirees reported  $3.0 \pm 2.2$  chronic medical conditions, with the most common being bone problems (48.0%), high blood pressure (38.6%), eye conditions (28.6%), high cholesterol (27.5%) and cardiovascular disease (26.2%). Pensioners had the highest number of chronic medical conditions ( $4.8 \pm 2.6$ ); they also had the worst QoL, with an EQ-5D-3L index value significantly lower than other groups ( $P < 0.001$ ). Retired people had a good QoL according to the EQ-5D-3L index

**Table 1** Differences between the working population, retired people, homemakers and pensioners according to sociodemographic characteristics and retirement, and social network-related variables

Variables	Total <i>n</i> (%) mean ± SD	Working ( <i>n</i> = 93) <i>n</i> (%) mean ± SD	Retired ( <i>n</i> = 585) <i>n</i> (%) mean ± SD	Homemaker ( <i>n</i> = 334) <i>n</i> (%) mean ± SD	Pensioner ( <i>n</i> = 78) <i>n</i> (%) mean ± SD	<i>P</i> -value
Sociodemographic variables						
Sex						N/A <sup>†</sup>
Men	483 (43.7)	56 (60.2)	416 (71.1)	0 (0)	5 (6.4)	
Women	623 (56.3)	37 (39.8)	169 (28.9)	334 (100)	73 (93.6)	
Age (years)	72.1 ± 7.8	62.3 ± 2.8	73.3 ± 7.1	72.3 ± 8.0	74.5 ± 8.2	<0.001 <sup>‡</sup>
Marital status						<0.001 <sup>†</sup>
Single/separated/ divorced	113 (10.2)	19 (20.9)	77 (13.1)	8 (2.4)	5 (6.4)	
Married/with a partner	645 (58.3)	60 (65.9)	356 (60.9)	209 (62.6)	12 (15.4)	
Widowed	345 (31.2)	12 (13.2)	152 (26.0)	117 (35.0)	61 (78.2)	
Educational level						<0.001 <sup>†</sup>
<Primary	349 (31.6)	12 (12.9)	165 (28.2)	124 (37.1)	43 (55.1)	
Primary	432 (39.1)	31 (33.3)	226 (38.6)	145 (43.4)	25 (32.1)	
Secondary/higher	324 (29.3)	50 (53.8)	194 (33.2)	65 (19.5)	10 (12.8)	
Self-perceived household economic status (range 0–10)	5.73 ± 1.6	6.47 ± 1.4	5.83 ± 1.5	5.55 ± 1.6	4.95 ± 1.7	<0.001 <sup>§</sup>
Satisfaction with economic resources (range 0–10)	5.50 ± 1.9	6.44 ± 1.7	5.71 ± 1.8	5.16 ± 2.0	4.43 ± 1.9	<0.001 <sup>§</sup>
Future economic security (range 0–10)	5.52 ± 1.9	6.34 ± 1.7	5.67 ± 1.9	5.24 ± 2.0	4.81 ± 1.9	<0.001 <sup>§</sup>
Retirement related variables						
Retirement age (years)	585 (52.9)	–	63.0 ± 3.4	–	–	–
Retirement QoL (range 1–5)	3.4 ± 0.9	3.4 ± 1.1	3.4 ± 0.9	3.4 ± 0.9	3.4 ± 0.8	0.554 <sup>§</sup>
Satisfaction with activity status (range 0–10)	6.6 ± 1.6	6.9 ± 1.5	6.7 ± 1.6	6.4 ± 1.5	5.7 ± 1.6	0.002 <sup>§</sup>
Social network variables						
Social support: DUFSS scale (range 11–55)	45.5 ± 9.2	45.9 ± 9.3	45.1 ± 9.1	45.0 ± 8.7	42.9 ± 8.3	0.359 <sup>§</sup>
Loneliness scale						0.028 <sup>a</sup>
No loneliness (range 0–1)	577 (52.2)	55 (59.8)	320 (54.8)	160 (48.0)	33 (42.3)	
Loneliness (range 2–6)	526 (47.6)	37 (40.2)	264 (45.2)	173 (52.0)	45 (57.7)	
Satisfaction with use of free time (range 0–10)	6.90 ± 1.8	7.22 ± 1.6	6.98 ± 1.8	6.84 ± 1.8	6.13 ± 1.9	<0.001 <sup>§</sup>

<sup>†</sup> $\chi^2$ -test. <sup>‡</sup>Kruskal–Wallis *H*-test. <sup>§</sup>ANCOVA, taking age as a covariable. DUFSS, Duke-UNC Functional Support Scale; N/A, Pearson's  $\chi^2$ -test not applicable; QoL, quality of life; SD, standard deviation.

(0.8 ± 0.2). Working people valued their health status most positively, followed by the retirees, homemakers and pensioners (*P* < 0.001). There was a significant difference in health status by activity status, even when using age as a control factor (*P* < 0.001).

### Health status regression models

Activity status was an explanatory factor in the partial model for analyzing self-perceived health status based on sociodemographic, retirement, perceived social

support and social network conditions, but excluding health variables (Table 3, partial model). Compared with retirees, working people had a higher probability of assessing their health positively (OR 2.35, 95% CI 1.07–5.15), whereas pensioners had a lower probability (OR 0.54, 95% CI 0.31–0.93). Homemakers did not show statistically significant differences (OR 0.82, 95% CI 0.60–1.12). There was also a positive trend in self-perceived health as age decreased (OR 1.73–2.80). Self-perceived health status was associated positively with: better educational level (OR 2.42, 95% CI 1.63–3.60)

**Table 2** Differences between the working population, retired people, homemakers and pensioners according to health variables

Variables	Total <i>n</i> (%) mean ± SD	Working ( <i>n</i> = 93) <i>n</i> (%) mean ± SD	Retired ( <i>n</i> = 585) <i>n</i> (%) mean ± SD	Homemaker ( <i>n</i> = 334) <i>n</i> (%) mean ± SD	Pensioner ( <i>n</i> = 78) <i>n</i> (%) mean ± SD	<i>P</i> -value
Depression (HADS-D)						0.001
No case (0–7)	827 (74.8)	85 (91.4)	440 (75.2)	243 (72.8)	52 (66.7)	
Doubtful case/case (8–21)	279 (25.2)	8 (8.6)	145 (24.8)	91 (27.2)	26 (33.3)	
Total number of chronic medical conditions (range 0–15)	3.3 ± 2.5	1.6 ± 1.8	3.0 ± 2.3	3.8 ± 2.6	4.8 ± 2.6	<0.001 <sup>#</sup>
Five most frequent chronic medical conditions						
Bone problems	590 (53.3)	27 (29.0)	281 (48.0)	214 (64.1)	62 (79.5)	<0.001 <sup>+</sup>
High blood pressure	441 (39.9)	17 (18.3)	226 (38.6)	151 (45.2)	43 (55.1)	<0.001 <sup>+</sup>
Vision problems	321 (29.0)	18 (19.4)	167 (28.6)	107 (32.0)	26 (33.3)	0.093 <sup>+</sup>
Hypercholesterolemia	319 (28.9)	22 (2.7)	161 (27.5)	105 (31.4)	30 (38.5)	0.101 <sup>+</sup>
Cardiovascular disease	289 (26.1)	3 (3.2)	153 (26.2)	106 (31.7)	24 (30.8)	<0.001 <sup>+</sup>
EQ-5D-3L: index value (range 0–1)	0.8 ± 0.3	0.9 ± 0.1	0.8 ± 0.2	0.7 ± 0.3	0.7 ± 0.3	<0.001 <sup>#</sup>
Self-perceived health status (range 1–5)	3.7 ± 0.8	4.1 ± 0.6	3.7 ± 0.8	3.6 ± 0.8	3.4 ± 0.7	<0.001 <sup>§</sup>

HADS-D, Hospital Anxiety and Depression Scale-Depression subscale; SD, standard deviation. <sup>+</sup> $\chi^2$ -test. <sup>#</sup>Kruskal-Wallis *H*-test. <sup>§</sup>ANCOVA, taking age as a covariable.

and retirement QoL (OR 1.31, 95% CI 1.12–1.54), and lower loneliness (OR 1.91, 95% CI 1.44–2.55).

A second multivariate logistic regression model was computed, taking self-perceived health status as a dependent variable, and still adjusting for sociodemographic, retirement, social support, social network and health variables (Table 3, complete model). Self-perceived health status was positively associated with: educational level (OR 1.82, 95% CI 1.16–2.86), retirement QoL (OR 1.22, 95% CI 1.02–1.47), perceived social support (OR 1.03, 95% CI 1.01–1.05) and lack of depression (OR 4.88, 95% CI 3.29–7.22). Furthermore, self-perceived health status was negatively associated with chronic medical conditions (OR 0.60, 95% CI 0.55–0.66). When controlling for health variables, activity status was not significant.

### QoL regression models

In QoL regression models, the activity status and retirement QoL variables were not statistically significant. Health indicators were not included as independent variables in the partial model predicting QoL (Table 4). In this case, a better QoL assessment was associated with younger age groups (OR 2.35–7.26). It was also positively associated with males (OR 1.69, 95% CI 1.24–2.29), secondary level or higher education (OR 2.29, 95% CI 1.52–3.45) and no feelings of loneliness (OR 2.39, 95% CI 1.78–3.22).

Taking the EQ-5D-3L index as the dependent variable, and controlling for sociodemographic, retirement, social support, social network and health conditions (complete model; Table 4), a significant association was found between QoL and age (OR 1.96–4.26), depression (OR 5.60, 95% CI 3.78–8.30), perceived social support (OR 1.03, 95% CI 1.01–1.05) and number of chronic health conditions (OR 0.64, 95% CI 0.59–0.70).

## Discussion

The first goal was to compare sociodemographic characteristics, social and support network variables, and health indicators by activity status of community-dwelling people aged 60 years and older. We found that, although most working and retired people were men; most pensioners and all homemakers were women. Pensioners were the oldest group, with the higher proportion of widowhood. Pensioners also rated worse their occupation, and had more depression and total number of self-reported chronic medical conditions. In sum, the first hypothesis was met.

Activities related to home and family have been culturally assigned to women in Spain, especially in older generations, who follow a traditional role assignment. A higher proportion of women engaged in household chores has been previously documented by a national, general population survey: 91.9% of women surveyed carried out these tasks, compared with 74.7% of men.<sup>22</sup>

**Table 3** Assessment of self-perceived health status according to sociodemographic conditions, retirement, perceived social support, social network and health variables

Variables	$\beta$	SE	Wald	df	<i>p</i> -value	OR	95% CI
Partial model <sup>†</sup> (excluding health indicators)							
Constant	-1.65	0.33	25.01	1	<0.001		
Age (years; reference: 80 years and over)			27.49	4	<0.001		
60–64	1.03	0.27	15.01	1	<0.001	2.80	1.66–4.72
65–69	0.97	0.23	18.33	1	<0.001	2.64	1.69–4.12
70–74	0.89	0.21	18.47	1	<0.001	2.44	1.62–3.66
75–79	0.55	0.23	5.66	1	0.017	1.73	1.10–2.71
Educational level (reference: <primary)			19.87	2	<0.001		
Primary	0.21	0.16	1.62	1	0.203	1.23	0.89–1.70
Secondary/higher	0.88	0.20	19.27	1	<0.001	2.42	1.63–3.60
Activity status (reference: retirees)			12.11	3	0.007		
Working	0.85	0.40	4.57	1	0.033	2.35	1.07–5.15
Homemaker	-0.20	0.16	1.56	1	0.211	0.82	0.60–1.12
Pensioner	-0.62	0.28	4.85	1	0.028	0.54	0.31–0.93
Retirement QoL	0.27	0.08	11.47	1	0.001	1.31	1.12–1.54
Loneliness (reference: presence)							
No loneliness	0.65	0.14	19.95	1	<0.001	1.91	1.44–2.55
Complete model <sup>‡</sup>							
Constant	-1.16	0.52	5.06	1	0.024	0.31	
Educational level (reference: <primary)			6.98	2	0.031		
Primary	0.14	0.19	0.56	1	0.455	1.15	0.79–1.68
Secondary/higher	0.60	0.23	6.72	1	0.010	1.82	1.16–2.86
Retirement QoL	0.20	0.09	4.50	1	0.034	1.22	1.02–1.47
HADS-D (reference: case or doubtful case)							
No case	1.58	0.20	62.64	1	<0.001	4.88	3.29–7.22
Total no. chronic medical conditions	-0.51	0.05	123.21	1	<0.001	0.60	0.55–0.66
DUFSS	0.03	0.01	9.51	1	0.002	1.03	1.01–1.05

<sup>†</sup>Percentage of correct prediction = 68.84%.  $\chi^2 = 146.740$ ,  $P < 0.001$ . Nagelkerke's  $R^2 = 0.190$ . Hosmer–Lemeshow  $\chi^2 = 11.325$ ,  $P = 0.184$ . Besides the variables presented, the models were also controlled for the following non-significant variables ( $P \geq 0.05$ ): sex, marital status, Duke-UNC Functional Support Scale (DUFSS). <sup>‡</sup>Percentage of correct prediction = 63.1%.  $\chi^2 = 404.746$ ,  $P < 0.001$ . Nagelkerke's  $R^2 = 0.463$ . Hosmer–Lemeshow  $\chi^2 = 9.173$ ,  $P = 0.328$ . Besides the variables presented, the models were also controlled for the following non-significant variables ( $P \geq 0.05$ ): sex, age, marital status, activity status, loneliness. CI, confidence interval; df, degrees of freedom; HADS-D, Hospital Anxiety and Depression Scale-Depression subscale; OR, odds ratio; QoL, quality of life; SE,  $\beta$  standard error.

The higher proportion of widows in the pensioners' group could be partially explained by the longer life expectancy of women compared with men.<sup>1</sup> Despite this impressive advantage in life expectancy, many women spend these additional years with increased morbidity and a markedly reduced QoL. Therefore, a gender perspective of health determinants and QoL should be considered.<sup>23</sup> The higher proportion of women among homemakers and pensioners might explain their worse satisfaction with activity status. In a meta-analysis about gender differences in self-concept and psychological well-being in old age, women reported significantly lower subjective well-being and less positive self-concept than men.<sup>24</sup> Statistically controlling for gender differences in widowhood, health variables and socio-economic status decreased the observed differences.<sup>24</sup> In

the present study, pensioners were also the most vulnerable group in terms of comorbidity, low QoL levels and perceived poor health. The reason might lie in the composition of the group itself, mainly of people with disabilities and a significant number of widows. In a recent revision, physical inactivity among older adults, particularly those aging with a disability, was associated with poor QoL.<sup>25</sup>

For the second study goal, we analyzed the relationship between activity status, and self-perceived health status and QoL while controlling for the influence of sociodemographic and health variables. According to the present results, activity status was a determinant of self-perceived health status when health variables were excluded from the regression model. Therefore, our second hypothesis was only partly met. After

**Table 4** Assessment of good quality of life (EQ-5D-3L index) according to sociodemographic conditions and retirement, perceived social support, social network and health variables

Variables	$\beta$	SE	Wald	df	P-value	OR	95% CI
Partial model <sup>†</sup> (excluding health indicators)							
Constant	-1.30	0.20	41.98	1	<0.001	0.27	
Sex (reference: women)							
Men	0.52	0.16	11.34	1	0.001	1.69	1.24–2.29
Age (reference: over 80 years)			73.49	4	<0.001		
60–64 years	1.98	0.27	54.75	1	<0.001	7.26	4.29–12.26
65–69 years	1.56	0.24	42.78	1	<0.001	4.76	2.98–7.59
70–74 years	1.24	0.21	33.93	1	<0.001	3.44	2.27–5.22
75–79 years	0.85	0.23	13.40	1	<0.001	2.35	1.49–3.70
Educational level (reference: <Primary)			15.98	2	<0.001		
Primary education	0.24	0.17	1.97	1	0.160	1.27	0.91–1.77
Secondary/higher education	0.83	0.21	15.81	1	<0.001	2.29	1.52–3.45
Loneliness (reference: presence)							
No loneliness	0.87	0.15	33.21	1	<0.001	2.39	1.78–3.22
DUFSS	0.02	0.01	5.25	1	0.02	1.03	1.00–1.05
Complete model <sup>‡</sup>							
Constant	-1.00	0.49	4.23	1	0.040	0.37	
Age (Reference: over 80 years)			30.60	4	<0.001		
60–64 years	1.45	0.31	22.02	1	<0.001	4.26	2.33–7.81
65–69 years	1.22	0.27	19.83	1	<0.001	3.37	1.97–5.75
70–74 years	0.87	0.25	12.43	1	<0.001	2.38	1.47–3.85
75–79 years	0.67	0.27	6.04	1	0.014	1.96	1.15–3.34
Depression (reference: case or doubtful case)							
No case	1.72	0.20	73.72	1	<0.001	5.60	3.78–8.30
Total no. chronic medical conditions	-0.44	0.04	100.16	1	<0.001	0.64	0.59–0.70
DUFSS	0.03	0.01	7.51	1	0.006	1.03	1.01–1.05

<sup>†</sup>Percentage of correct prediction = 73.26.  $\chi^2 = 180.994$ ,  $P < 0.001$ . Nagelkerke's  $R^2 = 0.235$ . Hosmer–Lemeshow  $\chi^2 = 4.664$ ,  $P = 0.793$ . Besides the variables presented, the models were also controlled for the following non-significant variables ( $P \geq 0.05$ ): marital status, activity status, retirement QoL. <sup>‡</sup>Percentage of correct prediction = 67.1%.  $\chi^2 = 408.193$ ,  $P < 0.001$ . Nagelkerke's  $R^2 = 0.474$ . Hosmer–Lemeshow  $\chi^2 = 9.442$ ,  $P = 0.306$ . Besides the variables presented, the models were also controlled for the following non-significant variables ( $P \geq 0.05$ ): sex, marital status, education, activity status, retirement QoL, loneliness. CI, confidence interval; df, degrees of freedom; DUFSS, Duke-UNC Functional Support Scale; HADS-D, Hospital Anxiety and Depression Scale-Depression subscale; OR, odds ratio; QoL, quality of life; SE,  $\beta$  standard error.

adjustment for age, educational level, retired QoL assessment and feelings of loneliness, significant differences in self-perceived health status were observed between retirees and both the working population and pensioners. Homemakers did not show statistically significant differences. The best score of self-perceived health status among the working participants might be explained by their higher mental and physical health, and not by activity status itself, as suggested by the lower degree of depression and comorbidity. Although some authors have found that retirement has a negative effect on the retired person's mental and physical health,<sup>4–6,26,27</sup> other researchers do not support this.<sup>28–30</sup> Poorer health and high financial security could increase the likelihood of retirement, and the transition from work to retirement might be seen as part of many life events experienced during midlife that have an impact on well-being

in retirement.<sup>31,32</sup> In contrast with self-perceived health status, in the present study activity status was not associated with QoL. In a previous study in Japan, working status itself was not a determinant of QoL in community-dwelling older adults, whereas a higher annual personal income was associated with a better physical component of QoL.<sup>33</sup>

Of all the variables studied, educational level and retirement QoL were factors consistently associated with self-perceived health status. Previous studies had found that elderly people with lower educational attainment expressed greater concern about their health in analyses that controlled for age and comorbidity.<sup>34,35</sup> Another survey showed that participants who do full- or part-time work, but would prefer to work less than they actually do, had significantly worse mental health than those who were satisfied with their work status.<sup>31</sup>

In the present study, low loneliness and social support had a positive effect on self-perceived health status and QoL. Previous studies showed that loneliness in older people was a predictor of functional decline.<sup>36,37</sup> In a Swedish sample, older adults with high QoL reported better self-rated health and social support.<sup>38</sup> Similarly, in a national survey of British adults, social relationships and health were judged to be the most important areas of QoL.<sup>39</sup> Poor social support has also been associated with depression and medical morbidity.<sup>40,41</sup> As is well-known, and in line with other studies,<sup>8,9,42–44</sup> the presence of depression and comorbidity had a significant negative effect on self-perceived health status and QoL of older adults.

The present study had some limitations. As most of the sociodemographic variables significantly differ among the groups by activity status, the score of loneliness can be affected by participants' marital status. Previous studies showed that unmarried older people or living without a partner had a higher feeling of loneliness.<sup>36,37</sup> Besides, among unmarried people, loneliness was higher in those with financial difficulties and poor health.<sup>36</sup> In the present study, pensioners, who had the higher proportion of widowhood, had also higher loneliness, poor household economy indicators and poor health. Similar examinations about the bias of the sociodemographic variables to satisfaction with use of free time are also necessary. In addition to the problem of different classifications of activity status in the studies and different control groups chosen, activity status was self-defined in the present study. Moreover, a longitudinal study would help to determine whether the poor health of retired people and pensioners in relation to the working people's group might be in part a consequence of the retirement process. Another limitation of the present study was that we did not have information about other potential factors related to self-perceived health, such as use of health services, and thus we were not able to control for them in the analysis.

In conclusion, the study shows that community-dwelling older people in Spain generally enjoy good general health (self-perceived health status, low depression and relatively low comorbidity). In a cross-sectional approach, activity status was associated with self-perceived health status, although this association became non-significant when controlling for health variables. Furthermore, working people perceived their health status best and pensioners the worst, with no differences detected for homemakers. Therefore, it is important to take into account the activity status when designing interventions to improve the health status of older adults. These should also take into consideration social network factors, as well as physical and emotional health, and the educational level of the target population. An example of interventions could be those aimed

at preparing older adults who are still working for their retirement period, where they keep themselves active and healthy, which would have a positive impact in clinical aspects.

Future research directions should include a gender perspective in a study of activity status. Specifically, a more detailed analysis of the homemakers and pensioners groups is required, with a focus on the relationship between gender and activity status, and its association with self-perceived health. Inclusion of homemakers and pensioners would provide interesting information, as most of the studies focus on working versus non-working status of the older population.

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## Disclosure statement

The authors declare no conflict of interest.

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