Impact of the most frequent chronic health conditions on the quality of life among people aged >15 years in Madrid

M. Esteban y Peña[1], Rodrigo Jiménez García[2], J. M. Díaz Olalla[1], E. Villasevil Llanos[3], A. Gil de Miguel[2], X. Fernández Cordero[1]

Background: This study sought to ascertain to what degree health-related quality of life (HRQL) in the City of Madrid was affected by each of the most frequent chronic health conditions, and the specific quality-of-life (QL) domains on which such health conditions had the greatest impact, taking co-morbidity and socio-demographic variables into account. **Methods:** A descriptive, analytical, cross-sectional study was conducted covering 7341 subjects aged ≥16 years in the City of Madrid. Data were collected on self-reported diagnosed morbidity, including hypertension, hypercholesterolaemia, varicose veins, diabetes, chronic asthma/bronchitis, myocardial infarction/angina pectoris, stomach problems, allergy, arthrosis/arthritis or rheumatism, depression/anxiety, cataracts, cerebrovascular accidents (CVACs), chronic constipation, osteoporosis and Alzheimer's disease or dementia. HRQL was measured using the COOP/WONCA questionnaire. The effects of diagnosis, age, social class, gender and the co-morbidity were analysed using a multivariate analysis of covariance (ANCOVA). **Results:** The chronic health conditions that registered the worst overall mean scores on the COOP/WONCA questionnaire were Alzheimer's disease or dementia, Parkinson's disease, fibromyalgia, CVACs and depression, with scores of over 26 points in all cases. After the introduction of socio-demographic variables in the model, the highest values of Snedecor's F-test corresponds to depression ($F = 461.63$), 'arthrosis/arthritis or rheumatism' ($F = 175.41$), Alzheimer's disease or dementia ($F = 65.70$), gastric disorders ($F = 65.17$), cancer ($F = 43.08$) and CVACs ($F = 41.65$). **Conclusions:** Depression and 'arthrosis/ arthritis or rheumatism' are the two chronic health conditions, which have the greatest impact on HRQL in Madrid's citizens, therefore is mandatory to propose and implement public health strategies that would reduce the prevalence and morbidity of such disorders.

Keywords: chronic health conditions, COOP/WONCA Functional Health Assessment Charts, health dimension, quality of life.

Introduction

There is a good number of highly regarded studies that approach health from a quality-of-life (QL) standpoint. Their importance lies in their collection of data and measurement of aspects associated with subjects' social environment, the world of relationships and the burden that health conditions entails for the individual. This dimension, which was already incorporated in the WHO's 1946 definition of health, involves measuring health in ways other than via morbidity, mortality or, in the best of cases, functional status assessed through activities of daily living.[1–5]

Chronic health conditions are serious health problems in the elderly societies; an important cause of deterioration in QL; and a relevant reason for a great use of heath resources. Finding a cure is not always an attainable goal in the case of such health conditions but adding more years of life does lie within our reach, and that is why gaining knowledge of the impact which each of these health conditions has on QL is of the utmost interest.[6]

In addition to providing information on the more social aspects and assessing the burden of such health conditions, many studies link poor QL to a higher risk of institutionalization and mortality. Therefore, analysing health-related QL (HRQL) is useful for the purpose of monitoring and assessing a population's health.[4,7–11]

In Spain, the COOP/WONCA charts have been used to measure HRQL in populations suffering from a given disease. Recently, there have been published reference values for the entire Spanish population.[5,12] Accordingly, measures of the impact of chronic health conditions on our population based on this questionnaire are extremely novel.[13,14]

Other questionnaires, such as the 36-item Short Form Health Survey Questionnaire (SF-36), have been used to study the impact of chronic health conditions in multicentre studies around the world.[15,16]

This study sought to ascertain to what degree the HRQL of the adult (aged ≥16 years) population in Madrid municipality was affected by each of the most frequent chronic health conditions, and on which QL domains these health conditions had the greatest impact, taking into account the influence exerted by socio-demographic variables such as age, gender, social class and co-morbidity.

Methods

Design and study population

Data were obtained by means of a two-stage, population-based survey conducted from November 2004 to June 2005, using a face-to-face interview by means of structured questionnaire. The Madrid City Health Survey 2005 (CMHS'05) included

1 Institute of Public Health, Madrid Health (Madrid Salud), Madrid City Council, (Ayuntamiento de Madrid) Spain
2 Preventive Medicine and Public Health Teaching and Research Unit, Health Sciences Faculty, Rey Juan Carlos University, Alcorcón 28922, Spain
3 La Paz University Teaching Hospital, Madrid Region, Spain
Correspondence: Rodrigo Jimenez Garcia, Preventive Medicine and Public Health Teaching and Research Unit, Health Sciences Faculty, Rey Juan Carlos University, Alcorcón 28922, Spain, tel: +34 91 4888853, fax: +34 91 4888848, e-mail: rodrigo.jimenez@urjc.es

7341 subjects aged >15 years. The type of sampling used was a two-stage cluster design, and the estimated absolute sampling error was ± 0.7%.[5]

Outcome measures and definitions

The COOP/WONCA 9-item questionnaire, validated in Spanish,[14] was chosen to measure HRQL for the purpose of the City of Madrid Health Study because it is a short, easily manageable instrument. The questionnaire's nine charts encompass the different QL domains, namely: physical fitness (PHF); feelings (FEEL); daily activities (DA); social activities (SA); change in health status (CHS); health status (HS); pain (PAIN); social support (SS); and self-perceived QL. Each of the charts possesses a question referring to events that have happened in the preceding 2 weeks. These questions are then answered by choosing one of the five possible alternative replies accompanied by a drawing. This drawing depicts a level of HRQL along a 5-point ordinal scale, construed as an inverse scale, so that the higher the score, the lower the QL.

The results obtained from each of the domains can be summed up to obtain a 'COOP/WONCA summary index'. Lizán *et al*.[13,14] and Van Weel[17] have previously used this summary index in their studies.

The CMHS'05 inquired, using a closed (yes/no) question, about the presence of self-reported, medically diagnosed, chronic morbidity. The chronic diseases included comprised a list of frequent and important health conditions, regarded as such owing to their high prevalence, high mortality, considerable financial cost and/or greater use of health services.[8,9,11] The health conditions collected were: varicose veins; arterial hypertension (AHT); hypercholesterolaemia; diabetes; 'asthma/chronic bronchitis'; 'myocardial infarction/angina pectoris'; other heart conditions (heart failure and other); stomach problems (gastritis, gastric ulcer); allergy; 'arthrosis/arthritis or rheumatism'; 'depression/anxiety'; cataracts; cerebrovascular accidents (CVACs); chronic constipation; osteoporosis; and 'Alzheimer's disease or dementia'. An open-ended question was included to enable interviewees to indicate whether they suffered or not from any chronic health conditions not listed in the previous list. Of all the health conditions reported in answer to this question, the most frequent were included in this study, i.e. Parkinson's disease, fibromyalgia, cancer, 'schizophrenia and other psychiatric disorders', chronic hepatitis, herniated disc, glaucoma, deafness, thyroid diseases (hypo- and hyperthyroidism), kidney diseases (nephritis, renal lithiasis and kidney failure) and migraine.

Social class was recorded as per Gorthorpe's 1994 National Classification of Occupations (NCO), recommended by the Spanish Society of Epidemiology (Sociedad Española de Epidemiología).[18] For the study purpose we grouped social class in three categories: Classes I and II representing 'management staff in commerce and public administration and professions with university degrees'; Class III representing 'technical and support staff'; and Classes IV and V representing 'qualified and unqualified manual workers'.[18]

QL was described in each of the chronic health conditions, by calculating the respective mean scores for both the QL summary index and each of the domains. Chronic—health conditions—free persons aged >42 years were taken as the reference level for chronic health conditions. Forty-two years was chosen as the cut-off point because it was the chronic—health conditions—free life expectancy figure calculated for the City of Madrid in 2004, thus making the reference population comparable with the population with chronic health conditions.[12]

Statistical analysis

We first described the population according to the study variables and used the $\chi2$ statistical method for bivariate comparison of proportions, the Fisher's exact test was used when the expected values in any of the cells of the table, given the margins, is below 10 and the Yates correction for continuity when at least one cell of the table has an expected frequency >5. Secondly, we generated 10 multivariate analysis of covariance (ANCOVA) models. The 'COOP/WONCA summary index' and the results of each of the nine domains were taken as the dependent variables, and individual chronic health conditions, age, gender, social class and 'co-morbidity' as the independent variables. We created the dichotomous (yes/no) variable 'co-morbidity', which included subjects with any of the chronic conditions collected in order to control the effect of these conditions on the dependent variables.

Difference was assessed using Snedecor's *F*-test value, which represents the measure of the deviation in variance for each dependent variable in the linear model, and its significance (at $P < 0.05$). All analyses were performed using the SPSS 12.0 program.

Results

Among the 7341 persons finally interviewed, the mean age was 46.8 (95% CI 46.4–47.2) years and 46.3% were males. By age groups, the distribution was: 16–24 years, 11.8%; 25–44 years, 40.2%; 45–64 years, 26.2% and >64 years, 21.7%. According to social class, most had Classes IV and V (42.3%) followed by Classes I and II (30.3%) and Class III (23.6%). Overall, 53% of the population aged >15 years reported at least one of the chronic health conditions analysed. In 14% of such individuals, these chronic health conditions had, in some way, limited their principal activity during the preceding year. Prevalence of all chronic health conditions analysed increased with age.

The prevalences of the chronic health conditions reported in the City of Madrid citizens according to sex are shown in Table 1. The most prevalent self-reported health conditions were 'arthrosis/arthritis or rheumatism' and AHT, which affected 17.8 and 17.3% of the population, respectively. A breakdown by sex highlighted the fact that chronic health conditions tended to be more frequent in women, with the exception of diabetes mellitus and cardiovascular diseases, which were more usual among men. Mention should be made of the fact that 25.4% of adult women were affected by rheumatic problems such as arthrosis/arthritis.

The mean 'COOP/WONCA summary index' score in the reference population, i.e. chronic—health conditions—free subjects aged >42 years, was 18.4 points. The chronic diseases with the worst 'COOP/WONCA summary index' scores were 'Alzheimer's disease or dementia', Parkinson's disease, fibromyalgia, CVACs and depression, all of which registered total scores of over 26 points (Table 2).

Insofar as the different domains were concerned, the results were as follows: 'physical fitness' was very notably affected in patients with 'Alzheimer's disease or dementia' and CVACs. 'Feelings' were most affected by depression and to a slightly lesser degree by 'Alzheimer's disease or dementia' and 'schizophrenia and other psychiatric diseases'. 'Daily Activities' were limited chiefly among patients with 'Alzheimer's disease or dementia', Parkinson's disease and CVACs. In all the above disorders—particularly 'Alzheimer's disease or dementia'—as well as in fibromyalgia, 'social activities' were extremely limited. 'Pain' was especially important in rheumatic and traumatological conditions,

Table 1 Prevalence of self-reported chronic health conditions among the population aged >15 years, according to data drawn from the 2005 City of Madrid Health Survey

	Men (*n* = 3396) *n* (%)	Women (*n* = 3945) *n* (%)	Total (*n* = 7341) *n* (%)	*P*-value*
Arthrosis/arthritis/rheumatism	303 (8.9)	1000 (25.4)	1303 (17.8)	<0.0001*
AHT	522 (15.4)	746 (18.9)	1268 (17.3)	<0.0001*
Hypercholesterolaemia	439 (13)	570 (14.5)	1009 (13.7)	0.061
Allergy	366 (10.8)	534 (13.5)	900 (12.3)	<0.0001*
Depression	181 (5.3)	490 (12.4)	671 (9.1)	<0.0001*
Gastric problems	277 (8.2)	367 (9.3)	644 (8.8)	0.083
Varicose veins	116 (3.4)	528 (13.4)	644 (8.8)	<0.0001*
Other heart diseases	180 (5.3)	193 (4.9)	373 (5.1)	0.427
Osteoporosis	35 (1)	334 (8.5)	369 (5)	<0.0001*
Diabetes	162 (4.8)	175 (4.4)	337 (4.6)	0.500
Cataracts	117 (3.5)	223 (5.7)	340 (4.6)	<0.0001*
Asthma/Chronic Ostructive Pulmonary Disease (COPD)	137 (4)	196 (5)	333 (4.5)	0.056
Chronic constipation	65 (1.9)	234 (5.9)	299 (4.1)	<0.0001*
Angina/MCI	103 (3)	58 (1.5)	161 (2.2)	<0.0001*
CVAC	53 (1.6)	55 (1.4)	108 (1.5)	0.557
Thyroid diseases	9 (0.3)	87 (2.2)	96 (1.3)	<0.0001*
Deafness	20 (0.6)	75 (1.9)	95 (1.3)	0.269
Alzheimer's disease/dementia	30 (0.9)	51 (1.3)	81 (1.1)	0.094
Cancer	19 (0.6)	42 (1.1)	61 (0.8)	0.017*
Herniated disc	30 (0.9)	29 (0.7)	59 (0.8)	0.478
Migraine	17 (0.5)	33 (0.8)	50 (0.7)	0.081
Chronic hepatitis	23 (0.7)	13 (0.3)	36 (0.5)	0.033*
Kidney diseases	24 (0.7)	12 (0.3)	36 (0.5)	0.014*
Schizophrenia and other psychiatric disorders	14 (0.4)	8 (0.2)	22 (0.3)	0.102
Parkinson's disease	6 (0.2)	6 (0.2)	12 (0.2)	0.795
Fibromyalgia	0 (0)	10 (0.3)	10 (0.1)	0.003*

*P-value for differences between women and men using chi-square test. The Fisher's exact test and the Yates correction for continuity were used when necessary

Table 2 Mean scores for the 'COOP/WONCA QL summary index' for each self-reported chronic health conditions and for chronic health conditions-free subjects in the age group of >42 years

Self-reported chronic health conditions (*n* = valid cases[a])	COOP/WONCA QL summary index (mean)
Allergy (*n* = 895)	20.9
Migraine (*n* = 50)	21.5
Thyroid diseases (*n* = 94)	21.9
Hypercholesterolaemia (*n* = 1006)	22.5
Varicose veins (*n* = 643)	22.7
Deafness (*n* = 102)	22.8
Asthma/chronic bronchitis (COPD) (*n* = 332)	23
AHT (*n* = 1265)	23.1
Glaucoma (*n* = 37)	23.5
Gastric problems (*n* = 644)	23.6
Herniated disc (*n* = 59)	23.7
Kidney diseases (*n* = 36)	23.8
Diabetes (*n* = 334)	23.9
Chronic hepatitis (*n* = 36)	24.4
Arthrosis/arthitis/rheumatism (*n* = 1298)	24.5
Chronic constipation (*n* = 298)	24.6
Cataracts (*n* = 340)	24.7
Schizophrenia and other psychiatric disorders (*n* = 23)	24.8
Other heart diseases (*n* = 373)	25.1
Angina/myocardial infarction (MCI) (*n* = 160)	25.1
Cancer (*n* = 61)	25.5
Osteoporosis (*n* = 369)	25.6
Depression (*n* = 669)	26.2
CVACs (*n* = 109)	26.8
Fibromyalgia (*n* = 10)	28.1
Parkinson's disease (*n* = 12)	28.7
Alzheimer's disease/dementia (*n* = 81)	28.7
>42 disease-free (*n* = 1015)	18.4

a: Valid cases include only those subjects who had the 'COOP/ WONCA QL questionnaire' completed; therefore, the numbers may differ from those shown in Table 1

such as fibromyalgia, osteoporosis, herniated disc and 'arthrosis/arthritis or rheumatism' and Parkinson's disease. 'Schizophrenia and other psychiatric disorders' and Parkinson's disease sufferers perceived receiving the least 'social support'.

In Tables 3 and 4 are shown the results yielded by the multivariate analysis for the 'COOP/WONCA summary index' and each of the nine domains, when the variables age, sex, social class and co-morbidity were introduced in the model.

These results indicate that the health conditions, which most affected the 'COOP/WONCA summary index', were depression ($F = 461.63$) and 'arthrosis/arthritis or rheumatism' ($F = 175.41$) with disorders such as varicose veins, hearing problems and hypercholesterolaemia showing a very low impact on this summary index.

When individual domains were analysed, we found that the 'physical fitness' domain was particularly affected by CVACs ($F = 21.87$), depression ($F = 14.74$) and asthma/COPD ($F = 12.55$), whereas the 'feelings' domain scores were most influenced by depression ($F = 648.20$), gastric disorders ($F = 25.08$) and 'Alzheimer's disease or dementia' ($F = 23.63$). Both the 'daily activities' and 'social activities' domains were extremely affected by depression, 'Alzheimer's disease or dementia' and CVACs. The disorders and health conditions that had most influence on the 'health status' domain scores were depression, arthrosis and diabetes.

The analysis of the 'changes in health status' domain shows that the score in this domain was not influenced by any chronic health conditions, with age ($F = 47.49$) being the most decisive variable.

'Arthrosis/arthritis or rheumatism' ($F = 562.96$), gastric disorders ($F = 79.61$) and depression ($F = 65.54$) were the chronic health conditions that most affected the 'pain' domain. Finally, the 'social support' was specially associated with depression ($F = 23.33$), cataracts ($F = 22.05$) and varicose veins ($F = 14.70$).

Table 3 *F*-statistic values and their statistical significance for each self-reported chronic health conditions and sociodemographic variables of age, sex and social class, in respect of the COOP/WONCA chart summary index and Physical fitness, Feelings, Daily activities and Social activities domains

	Summary index		Physical fitness		Feelings		Daily activities		Social activities	
	F-test[a]	*P*-value[b]	*F*-test	*P*-value	*F*-test	*P*-value	*F*-test	*P*-value	*F*-test	*P*-value
Age	188.6	<0.01	951.9	<0.01	19.1	<0.01	**12.6**	<0.01	12.4	<0.01
Sex	55.4	<0.01	82.4	<0.01	29.2	<0.01	4	<0.05	5.8	<0.05
Social class	101.2	<0.01	24.7	<0.01	18.7	<0.01	38.8	<0.01	28.9	<0.01
Chronic disease	32.6	<0.01	2.3	0.1	27.9	<0.01	6.5	<0.05	2.4	0.1
Varicose veins	0.3	0.6	10.6	<0.05	6.5	<0.05	<0.05	0.8	0.1	0.8
AHT	1.1	0.3	4.8	<0.05	1.7	0.2	<0.05	0.9	0.1	0.7
Hypercholesterolaemia	0	0.9	0	0.9	0.1	0.8	1.6	0.2	3.2	0.1
Diabetes	32.3	<0.01	9.5	<0.05	4.9	<0.05	8.1	<0.05	12.3	<0.01
Asthma/COPD	12.8	<0.01	**12.6**	<0.01	1.4	0.2	6	<0.05	0.8	0.4
Angina/MCI	13.4	<0.01	4.8	<0.05	11.8	<0.05	1.7	0.2	4	<0.05
Other heart diseases	24.9	<0.01	3.4	0.1	7	<0.05	38.4	<0.01	27.8	<0.01
Gastric problems	65.2	<0.01	0.0	1	**25.1**	<0.01	19.3	<0.01	15.4	<0.01
Allergy	4.9	<0.05	2.4	0.1	5.2	<0.05	4.2	<0.05	8	<0.05
Arthrosis/arthritis/rheumatism	**175.4**	<0.01	8.6	<0.05	4.9	<0.05	44.3	<0.05	33	<0.01
Depression	**461.6**	<0.01	14.7	<0.01	**648.2**	<0.01	**286.0**	<0.01	**325.8**	<0.01
Cataracts	1.4	0.2	0	0.9	0.4	0.5	7.7	<0.05	0.2	0.7
CVACs	41.6	<0.01	**21.8**	<0.01	4.3	<0.05	71.6	<0.01	60.1	<0.01
Chronic constipation	2.2	0.1	0.5	0.5	7.1	<0.05	25.7	<0.01	6.2	<0.05
Osteoporosis	19.6	<0.01	0.9	0.3	4.6	<0.05	16.0	<0.01	1.7	0.2
Alzheimer's disease/dementia	**65.7**	<0.01	9.5	<0.05	**23.6**	<0.01	**150**	<0.01	**197.5**	<0.01
Herniated disc	21.3	<0.01	0.5	0.5	2.4	0.1	11.9	<0.05	11.5	<0.05
Migraine	10.7	<0.05	0.3	0.6	0.1	0.7	0.1	0.8	0.9	0.3
Chronic hepatitis	21.3	<0.01	3.4	0.1	3.2	0.1	2.2	0.1	28	<0.01
Thyroid diseases	0.1	0.7	0	0.9	2.4	0.1	1.5	0.2	2	0.2
Cancer	43.1	<0.01	10.5	<0.05	13.8	<0.01	9.4	<0.05	28.7	<0.01
Schizophrenia/other psychiatric disease	18.1	<0.01	4.5	<0.05	3.4	0.1	15.8	<0.01	14.8	<0.01
Glaucoma	2.8	0.1	0.3	0.6	0.2	0.7	2.5	0.1	0.4	0.5
Deafness	0.3	0.6	0.4	0.5	0.6	0.4	0.5	0.5	0.1	0.8
Kidney diseases	8.8	<0.05	1	0.3	0.1	0.8	20.8	<0.01	9.2	<0.05
Parkinson's disease	17.9	<0.01	1.3	0.3	1.7	0.2	23.4	<0.01	12.7	<0.01
Fibromyalgia	11.2	<0.05	1	0.3	0	0.9	5.5	<0.05	6.6	<0.05

Result of the multivariate ANCOVA when the variables age, sex, social class and co-morbidity were introduced in the models
a: Snedecor's *F*-test value
b: *P*-value ≤ 0.05 deemed significant
Significance for data in bold is $p < 0.05$

Discussion

The high prevalence of chronic diseases observed in Madrid municipality is a problem of great importance, affecting 53% of all interviewees. Studies conducted at a national level report prevalence of up to 43%.[19,20] Other studies, such as the IQOLA Project, which used a similar methodology for recording chronic health conditions, reported a comparable level of frequency (55.1%) among the adult population. Likewise, the most prevalent health conditions types reported by this study were similar to those detected by us, i.e. AHT, allergy and osteoarticular problems, though neither hypercholesterolaemia nor depression were included.[16,21,22]

Our analysis included an extensive list of chronic health conditions with widely varying prevalences, so that the number of cases in which QL was studied differed depending on the health conditions that were being targeted. Hence, whereas the number was high in AHT, hypercholesterolaemia and 'arthrosis/arthritis or rheumatism', with over 1000 cases each, the number stood at around only 10 cases in fibromyalgia and Parkinson's disease. Indeed, the last two health conditions were observed to affect QL to a substantial degree, but when ANCOVA was performed to compare this result against the total, these same health conditions occupied more discreet rankings, probably due to the small number of cases available.

The QL results obtained differ widely according to the chronic health conditions analysed. The patients who scored highest on the 'COOP/WONCA summary index' were those who suffered from neurological diseases, such as 'Alzheimer's disease or dementia', Parkinson's disease and CVACs, as well as fibromyalgia and depression. When the analysis incorporated sex, age, social class and co-morbidity, this ranking was seen to vary, with the principal disorders that reduced QL being depression, followed by 'arthrosis/arthritis or rheumatism' and 'Alzheimer's disease or dementia', and lastly the gastric disorders group (including gastritis and gastric ulcer, among others) and CVACs. This analysis was performed due to the well-known influence of gender, age, social class and chronic health conditions on QL,[5,22–26] as was likewise shown by our study. When socio-demographic and health variables are included in the statistical model, the subsequent change in the health conditions ranking is attributable to the fact that certain problems, such as 'Alzheimer's or dementia' and Parkinson's disease, are normally manifested at very advanced ages of life, when the individual's QL declined by age. Accordingly, when this factor is taken into account, these health conditions tend to descend in the table and their place is taken by others, which affect patients at earlier ages and reduce their QL to an important degree, as is the case with 'arthrosis/arthritis or rheumatism' and depression.

With respect to the differences reported by various studies according to the type of disease involved, it would appear that health conditions such as diabetes, asthma, chronic heart diseases, gastric ulcer and depression are associated with a worse QL than are others such as hypertension, hypercholesterolaemia and allergy, while neurological and

Table 4 *F*-statistic values and their statistical significance for each self-reported chronic health conditions and socio-demographic variables of age, sex and social class, in respect of the COOP/WONCA chart summary index and health status, changes in health status, pain, social support and QL domains

	Health status		Changes in health Status		Pain		Social support		QL	
	F-test[a]	*P*-value[b]	*F*-test	*P*-value	*F*-test	*P*-value	*F*-test	*P*-value	*F*-test	*P*-value
Age	196.5	<0.01	47.5	<0.01	4.9	<0.05	67.8	<0.01	8.1	<0.05
Sex	3.7	0.1	2.6	0.1	36.4	<0.01	8.1	<0.05	0.4	0.6
Social class	60.2	<0.01	2.1	0.2	25.5	<0.01	19.2	<0.01	105.7	<0.01
Chronic disease	68.7	<0.01	2.1	0.1	66.1	<0.01	0.2	0.6	28.4	<0.01
Varicose veins	0.6	0.4	0.1	0.7	3.5	0.1	14.7	<0.01	0.3	0.6
AHT	5.3	<0.05	2.1	0.1	3.1	0.1	4.7	<0.05	1.1	0.3
Hypercholesterolaemia	1	0.3	1.8	0.2	0.9	0.3	0.3	0.6	0.3	0.6
Diabetes	**63**	<0.01	1.7	0.2	2.6	0.1	5.4	<0.05	12.2	<0.01
Asthma/COPD	22.9	<0.01	2.3	0.1	0.8	0.4	0.5	0.5	1.3	0.3
Angina/MCI	9.6	<0.05	1.8	0.2	0.7	0.4	2.9	0.1	2.4	0.1
Other heart diseases	17	<0.01	1.8	0.2	4.4	<0.05	0.1	0.8	10.3	<0.05
Gastric problems	36.9	<0.01	2.9	0.1	79.6	<0.01	5.4	<0.05	32.6	<0.01
Allergy	0.4	0.5	2.8	0.1	1.3	0.3	0.7	0.4	1.8	0.2
Arthrosis/arthritis/rheumatism	**89.5**	<0.01	**3.7**	0.1	563	<0.01	11	<0.05	18.7	<0.01
Depression	**164**	<0.01	**7.6**	<0.05	65.5	<0.01	**23.3**	<0.01	**157.1**	<0.01
Cataracts	9	<0.05	0	1	0	0.8	22	<0.01	2.7	0.1
CVACs	31.2	<0.01	0.5	0.5	5.2	<0.05	0.1	0.8	5.3	<0.05
Chronic constipation	0.8	0.4	2.4	0.1	8.1	<0.05	10.3	<0.05	1.8	0.2
Osteoporosis	12.6	<0.01	0	0.9	64.5	<0.01	0.5	0.5	0.7	0.4
Alzheimer's disease/dementia	31.3	<0.01	0.2	0.7	0.2	0.7	0.8	0.4	19.6	<0.01
Herniated disc	19	<0.01	0.1	0.8	48.2	<0.01	0.2	0.7	8.3	<0.05
Migraine	9.4	<0.05	**6.8**	<0.05	27.5	<0.01	1.2	0.3	2.8	0.1
Chronic hepatitis	23.4	<0.01	3.5	0.1	8.4	<0.05	0.5	0.5	4.1	<0.05
Thyroid diseases	2.9	0.1	0	1	0.8	0.4	0	0.9	1.4	0.2
Cancer	37.1	<0.01	1.1	0.3	4.9	<0.05	6	<0.05	**25.8**	<0.01
Schizophrenia/other psychiatric disease	8.6	<0.05	1.2	0.3	0	0.9	12.6	<0.01	10	<0.05
Glaucoma	3.4	0.1	0	0.8	<0.05	0.9	2.1	0.1	1.9	0.2
Deafness	2.2	0.1	0.1	0.7	0.1	0.8	6.1	<0.05	0.4	0.5
Kidney diseases	4.3	<0.05	2	0.2	1.2	0.3	1.3	0.3	6.1	<0.05
Parkinson's disease	5.6	<0.05	0.2	0.6	3.7	0.1	3.6	0.1	10.9	<0.05
Fibromyalgia	7.3	<0.05	0	1	16.5	<0.01	0	1	9.7	<0.05

Result of the multivariate ANCOVA when the variables age, sex, social class and co-morbidity were introduced in the models
a: Snedecor's *F*-test value
b: *P*-value $\leq$ 0.05 deemed significant
Significance for data in bold is $p < 0.05$

mental problems seriously affect QL.[3,27–30] Similar results were yielded by our study, with depression, 'arthrosis/arthritis or rheumatism' and the 'Alzheimer's disease or dementia' proving to be the health conditions that most compromise the QL. Heart diseases and asthma, however, occupy a middle ranking on this scale. Like García *et al.*,[26] we too observed that hypertension and hypercholesterolaemia affect QL very slightly. Nevertheless, allergy, which did not seem to affect QL to any major degree before the variables of sex, age, social class and co-morbidity were introduced into the model, rose to rank midway in the table when the latter analysis was performed.

Special mention should be made for depression, since it is the one disorder that affects the QL summary index most and the only one to influence all QL domains. In a study, which assessed the impact of eight chronic health conditions on QL in the Chinese population, Lam[30] observed that depression raised the score across all COOP/WONCA domains, except for 'daily activities', and was therefore the disorder that most influenced QL in this population. Other studies, such as the disease group-based analysis conducted by Sprangers and Aaronson,[11] showed that while psychiatric diseases as a whole affected QL no more than did any other group, in the individual analysis depression was well ahead of the rest. The health conditions groups listed by these authors as most affecting QL are gastrointestinal, neurological (pre-eminently Parkinson's disease, epilepsy, multiple sclerosis and stroke), renal and musculoskeletal disorders (herniated disc and osteoarthritis in particular).[2,31–35]

When the 'pain' domain is concerned, first places go to 'arthrosis/arthritis or rheumatism' and gastric problems, mainly gastritis and ulcer, both of which are known to be especially painful. Even so, attention should be drawn to the presence of depression in third place. Recent studies make the point that, though pain is not a diagnostic symptom of depression, complaints of pain are nonetheless very frequent in such patients, with evidence to suggest that, among depressive patients, those who report pain have a worse QL than those who do not,[34] As seen above, CVAC is the disease that most influences the 'physical fitness' domain. This disease also has a very pronounced impact on the domains of 'daily activities' and 'social activities'. These results are in line with those observed for stroke patients by Martins *et al.*,[36] using the COOP/WONCA questionnaire. These authors confirmed that physical aptitude and ability to perform daily activities were the hardest-hit physical dimensions, preventing patients from performing a series of basic and instrumental activities of daily living, and went on to establish that affective-emotional status and self-perception of general health status correlated with degree of physical disability.[36] The above-mentioned study on the Chinese population also reported that the 'daily activities' domain was significantly affected in such patients.[30]

The position with respect to 'changes in health status' is understandable, in that the question refers to changes in health in the preceding 2 weeks, which are not necessarily linked to chronic health conditions.

There are a number of study limitations. First, the use of unvalidated self-report data on chronic health conditions could entail a possible bias. In this respect, the similarity in the prevalence of self-reported chronic health conditions and in the distribution of subjects by sex and age group, when compared with other Spanish studies, argues in favour of the sample's representativeness.[20] It must also be mentioned that the CMHS'05 did not collect information about the duration of the self-reported health conditions.[5]

Second, the ESCM'05 includes only non-institutionalized subjects,5 something that may possibly underestimate the prevalence of chronic health conditions, since in elderly homes and residences may well be higher than the mean.

Third, all information obtained within the interviews may be subject to recall errors or to the tendency of individuals to give socially desirable responses within interviews.

Fourth, as commented previously the low prevalence of certain chronic conditions such as fibromyalgia and Parkinson's disease is a limitation for the multivariable analysis.

Fifth, this work was conducted in an urban population so the validity of the results for the rural population must be considered with care.

Lastly, the initial response rate to NHS was 40%, and the non-response rate was slightly higher among females, those with lower educational level and immigrants so that the existence of possible non-response bias should thus be considered.[5]

The strengths of this study rely on its large sample, the high number of chronic conditions analysed and the multivariate statistical method that allows us to control the effect of relevant covariates such as age, gender, social class and co-morbidity.

We conclude that among the more frequent chronic heath conditions affecting the Madrid city population, and after controlling for possible confounding variables, the two that have the greatest impact in terms of QL are depression and 'arthrosis/arthritis or rheumatism'. Therefore, it is mandatory to propose and implement public health strategies such as health prevention, promotion and education that would reduce the prevalence and morbidity of such disorders.

Acknowledgements

Key points

- Rheumatic problems and hypertension, hypercholesterolaemia, allergies and depression are the more prevalent self-reported chronic health conditions in the City of Madrid.
- The impact on QL is significantly influenced by sex and social class.
- In the city of Madrid, depression and rheumatic problems are the chronic health conditions that have the highest impact in terms of QL.

References

1   Nelson EC, Landgraf JM, Hays RD, et al. The functional status of patients: how can it be measured in physicians' offices? *Med Care* 1990;28:1111–26.

2   Jaffe A, Froom J, Galambos N. Minor depression and functional impairment. *Arch Fam Med* 1994;3:1081–86.

3   De Grauw WJC, Van de Lisdonk EH, Behr RRA, et al. The impact of type 2 diabetes mellitus on daily functioning. *Fam Pract* 1999;16:133–39.

4   Stewart AL, Greenfield S, Hays RD, et al. Functional status and well-being of patients with chronic conditions. Results from the Medical Outcomes Study. *JAMA* 1989;262:907–13.

5   Madrid Salud. Encuesta de Salud de La Ciudad de Madrid 2005 [Madrid City Health Survey 2005]. Ayuntamiento de Madrid. Available at: http://www.madridsalud.es/publicaciones/encuesta-salud2005.pdf (accessed on 20 March 2009).

6   Schwartzmann L. Calidad de vida relacionada con la salud: aspectos conceptuales [Quality of Life in Relation to Health: Conceptual Aspects]. *Cienc Enferm* 2006;9:9–21.

7   Hoffman C, Rice D, Sung HY. Persons with chronic conditions their prevalence and costs. *J Am Med Assoc* 1996;276:1473–79.

8   Schellevis FG, Van De Lisdonk EH, Van Der Velden J, et al. Consultation rates and incidence of intercurrent morbidity among patients with chronic disease in general practice. *Br J Gen Pract* 1994;44:259–62.

9   Kempen GI, Ormel J, Brilman EI, Relyveld J. Adaptive responses among Dutch elderly: the impact of eight chronic medical conditions on health-related quality of life. *Am J Public Health* 1997;87:38–44.

10   Schlenk EA, Erlen JA, Dunbar-Jacob J, et al. Health-related quality of life in chronic disorders: a comparison across studies using the MOS SF-36. *Qual Life Res* 1998;7:57–65.

11   Sprangers MA, Aaronson NK. The role of health care providers and significant others in evaluating the quality of life of patients with chronic disease: a review. *J Clin Epidemiol* 1992;45:743–60.

12   Madrid Salud. Estudio de Salud de la Ciudad de Madrid 2006 [Madrid City Health Study 2006]. Ayuntamiento de Madrid. Available at: http://www.madridsalud.es (accessed on 20 March 2009).

13   Lizan L, Reig A, Richart M, Cabrero J. Study on health related quality of life based on information from COOP/WONCA sheets. *Med Clin* 2000;114:76–80.

14   Lizán Tudela L, Reig Ferrer A. Cross cultural adaptation of a health related quality of life measurement: the Spanish version of the COOP/WONCA cartoons. *Aten Primaria* 1999;24:75–82.

15   Lam CLK, Lauder IJ. The impact of chronic diseases on the health-related quality of life (HRQOL) of Chinese patients in primary care. *Fam Pract* 2000;17:159–66.

16   Alonso J, Ferrer M, Gandek B, et al. Health-related quality of life associated with chronic conditions in eight countries: results from the International Quality of Life Assessment (IQOLA) Project. *Qual Life Res* 2004;3:283–98.

17   Van Weel C. Functional status in primary care: COOP/WONCA charts. *Disabil Rehabil* 1993;15:96–101.

18   Regidor E. The Goldthorpe Social Class Classification: reference framework for a proposal for the measurement of social class by the Working Group of the Spanish Society of Epidemiology. *Rev Esp Salud Pública* 2001;75:13–22.

19   Instituto Nacional de Estadística. Encuesta Nacional de Salud de España 2006 [Spanish National Health Survey 2006]. Available at: http://www.msc.es/estadEstudios/estadisticas/encuestaNacional/encuesta2006.htm (accessed on 20 March 2009).

20   Instituto Nacional de Estadística. Encuesta Nacional de Salud de España 2003 [Spanish National Health Survey 2003]. Available at: http://www.ine.es/en/metodología/t15/t1530419_en.pdf (accessed on 20 March 2009).

21   Aaronson NK, Acquadro C, Ajonso J, et al. International QuaIity of Life Assessment (IQOLA) Project. *Qual Life Res* 1992;1:349–51.

22   Wagner AK, Gandek B, Aaronson NK, et al. Cross-cultural comparisons of the content of SF-36 translations across 10 countries: results from the IQOLA Project. International Quality of Life Assessment. *J CIin Epidemiol* 1998;51:925–32.

23   Tomás C, Moreno LA. Factores que determinan la percepción de salud y la calidad de vida en mayores de 75 años [Factors that determine the

perceived health and quality of life over 75 years] [in German]. *Gac Sanit* 1999;13:90–3.

24 Donmez L, Gokkoca Z, Dedeoglu N. Disability and its effects on quality of life among older people living in Antalya city center, Turkey. *Arch Gerontol Geriatr* 2005;40:213–23.

25 Ware JE, Bayliss MS, Rogers WH, et al. Differences in 4-year health outcomes for elderly and poor, chronically III patients treated in HMO arid fee-for-service systems. Results from the Medical Outcomes Study. *JAMA* 1996;276:1039–47.

26 García A, Pinilla J, Peiró S. An approach to ''quality-adjusted life years'' quality of life weights from self-assessed health status. *Gac Sanit* 2006;20:457–64.

27 Krousel-Wood MA, Richard N. Health status assessment in a hypertension section of an internal medical clinic. *Am J Med Sci* 1994;308:211–17.

28 de Bock GH, Kaptein AA, Touw-Otten F, Mulder JD. Health-related quality of life in patients with osteoarthritis in a family practice setting. *Arthritis Care Res* 1995;8:88–93.

29 Somerset M, Sharp D, Campbell R. Multiple sclerosis and quality of life: a qualitative investigation. *J Health Serv Res Policy* 2002;7:151–59.

30 Lam CLK. How does depression present in general practice? *Hong Kong Med J* 1995;1:225–29.

31 De Souza LH, Frank AO. Experiences of living with chronic back pain: the physical disabilities. *Disabil Rehabil* 2007;29:587–96.

32 Högberg T, Magnusson A, Lutzen K. Living by themselves? Psychiatric nurses' views on supported housing for persons with severe persistent mental illness. *J Psychiatr Ment Health Nurs* 2006;13:735–41.

33 Dernovsek MZ, Prevolnik Rupel V, Rebolj M, Tavcar R. Quality of life and treatment costs in schizophrenic outpatients, treated with depot neuroleptics. *Eur Psychiatry* 2001;16:474–82.

34 Mustafa MH, Rush J. Pain in depression: STAR*D study findings. *J Psychosom Res* 2007;63:113–22.

35 Sprangers MAG, de Regt EB, Andries F, et al. Which chronic conditions are associated with better or poorer quality of life? *J Clin Epidemiol* 2000;53:895–907.

36 Martins T, Ribeiro JP, Garretts C. Disability and quality of life of stroke survivors: evaluation nine months after discharge. *Rev Neurol* 2006;42:655–59.