



## Original Article

## Knowledge on Musculoskeletal Diseases by the Spanish Population<sup>☆</sup>

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## ARTICLE INFO

## Article history:

Received 16 December 2012

Accepted 3 April 2013

## Keywords:

Population knowledge  
Cross-sectional study  
Musculoskeletal diseases  
Survey

## ABSTRACT

**Objective:** To explore knowledge on musculoskeletal-diseases (MSDs) by the Spanish population.

**Methods:** This was a cross-sectional study of the general population (>18 years) using a telephone survey of 1009 subjects stratified by habitat size, age, sex, and geographic area. A structured questionnaire was used to collect information on the subjects, their general knowledge of MSDs (GK), their specific knowledge of particular MSDs (SK), and their knowledge of their social impact (KSI). Synthetic indicators of the level of knowledge were used to analyze, using univariate and multivariate models, variables associated to the level of knowledge.

**Results:** The KSI level ranges from medium–high (mean: 0.62±0.16 out of 1), suggesting that most subjects recognize MSDs as disabling conditions which affect the ability to work and have a high personal and social cost. The GK level is intermediate (mean: 0.50±0.17); 60% of subjects know something about MSDs, but 54% state that their information is poor/very poor. The SK level is low (mean: 0.18±0.10), and there are some MSDs that are little known (lupus, spondylitis). Being male or retired or having a MSD is associated to a greater knowledge of MSDs.

**Conclusion:** The Spanish population has a medium level of knowledge of the frequency and extent to which MSDs affect performance of activities by those who suffer them. They identify them adequately and have a GK of their symptoms, but have little information about them. The level of knowledge varies depending on social and demographic factors and on whether or not the subject has direct or indirect experience of what a MSD means.

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## Conocimiento de la población española de las enfermedades músculo-esqueléticas

## RESUMEN

**Objetivo:** Explorar el conocimiento sobre enfermedades músculo-esqueléticas (EME) en la población española.

**Métodos:** Estudio transversal, dirigido a la población general española mediante encuesta telefónica a 1.009 sujetos mayores de 18 años estratificados por tamaño del hábitat, edad, género y zona geográfica. Con un cuestionario estructurado, se recogió información de los sujetos, su conocimiento general de las EME (CG), su conocimiento específico de EME concretas (CE) y su conocimiento del impacto social (CIS). Se elaboraron indicadores sintéticos (escala 0–1) de nivel de conocimiento para analizar, mediante análisis univariante y multivariante, las variables asociadas al nivel de conocimiento.

**Resultados:** El nivel de CIS es medio-alto (media: 0,62 ± 0,16) y recoge el reconocimiento mayoritario de las EME como incapacitantes, que afectan a la capacidad laboral y provocan un alto coste personal y social. El nivel de CG es intermedio (media: 0,50 ± 0,17), un 60% conoce algo sobre las EME, aunque el 54% califica su información como mala/muy mala. El nivel de CE es bajo (media: 0,18 ± 0,10), existiendo EME

## Palabras clave:

Conocimiento poblacional  
Estudio transversal  
Enfermedades músculo-esqueléticas  
Encuesta

<sup>☆</sup> Please cite this article as: Lázaro P, et al. Conocimiento de la población española de las enfermedades músculo-esqueléticas. Reumatol Clin. 2013;9:274–280.

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muy poco conocidas (lupus y espondilitis). Ser hombre, jubilado o presentar una EME, se asocia con más conocimiento sobre las EME.

**Conclusión:** La población española tiene un nivel medio de conocimiento de la frecuencia y medida en que las EME afectan el desempeño de las actividades de quienes las presentan. Las identifican suficientemente, conociendo a grandes rasgos su sintomatología, aunque saben poco de ellas. El nivel de conocimiento varía según los factores sociodemográficos y la experiencia directa e indirecta de presentación de EME.

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## Introduction

Musculoskeletal diseases (MD) are usually chronic, degenerative, with great social, economic and quality of life impact on patients and their family environment. They also lead to a considerable expense by health systems. However, despite their impact and significance, the extent of information on these diseases and their consequences possessed by citizens is unknown. There are few publications on the knowledge of the general population on these conditions. The results of some of these studies reflect the limited knowledge about them, especially rheumatoid arthritis (RA),<sup>1–7</sup> something also observed in primary caregivers of women who have this disease.<sup>2</sup>

While some authors agree that both the general population<sup>3</sup> and<sup>4</sup> patients feel a moderate desire to know more about MD, many societal beliefs that relate to food, cold or wet weather, or osteoarthritis identified as rheumatoid arthritis, or who consider RA to be a curable disease persist.<sup>3,5,6</sup> The lack of knowledge of the population about MD, particularly their symptoms, can cause delayed diagnosis and lead to delays in treatment, with no chance of avoiding structural damage to the joints, leading to a decreased quality of life and increased health spending.

In our environment, we found no publications on the knowledge of MD in the Spanish population. Therefore, we decided to develop this study in order to explore what Spanish people know about MD and identify subject characteristics associated with this knowledge.

## Materials and Methods

### Design

Cross-sectional, descriptive-analytical; data obtained by a telephone survey addressed to the Spanish population. Field of study: national, except Ceuta and Melilla. Study subjects: people over 18 years working outside of the health field.

The sample was preset for a 3% accuracy in some critical variable of knowledge, assuming maximum uncertainty ( $p=q=0.5$ ), and  $\alpha$  of 0.05 was 1000 interviews. Sampling was proportional to the population and stratified according to five variables: population size (over 5 sections: <10 000, 10 000–50 000, 50 001–100 000, 100 001–500 000, and >500 000 inhabitants), age (<30 years, 30–44, 45–64, and >64 years), gender and geographical area (Andalusia, Catalonia, Madrid, Valencia, Basque Country, rest of North and rest of the South).

A structured questionnaire was developed from items from other similar projects of the research team ([www.taiss.com/pubdisecues.htm](http://www.taiss.com/pubdisecues.htm)), publications and websites<sup>7–14</sup> patients and professionals related to the object of study. With the review of this information, the final questionnaire was developed, consisting of 27 questions grouped into 41 items. The demographic variables included were: (1) age, sex, educational level, employment status, type of work, (2) variables on knowledge of the social impact of MD: prevalence and impact on employment in job loss and disability caused by MD compared with other diseases, and their population-level consequences in terms of care burden, social cost, and impact on function, (3) variables on general knowledge of MD: knowledge on MD, recognition of them or their symptoms

from a list of diseases and symptoms, the ability to specify up to 3 MD, knowledge on the more prevalent MD, and an evaluation to determine how much daily life, work and social activities, and purchasing power was affected in those with the disease, (4) variables on specific knowledge of 9 MD (back pain, arthritis, osteoarthritis, osteoporosis, rheumatoid arthritis, fibromyalgia, lupus, spondylitis and gout), evaluation on the knowledge of the epidemiological characteristics of the MD regarding age and sex, and knowledge of typical symptoms, (5) variables on MD by the respondent or a family member, and (6) an assessment of the quality of the information held on the matter, globally or regarding its symptoms, treatment and prevention, specifying the source of origin. The questionnaire can be downloaded from <http://taiss.net/conocimiento-eme/Cuest-Pob-Gen-EMEs-V-Final.pdf>.

Telephone interviews with the subjects, selected from the INFO-BEL database,<sup>15</sup> were conducted between October and November 2008 by trained personnel.

To meet the objective of the study, in addition to a descriptive study, we decided to group the information into synthetic indicators to report on the level of knowledge of MD and allow for comparisons of said level between subgroups. In developing these indicators, the researchers were advised by two rheumatologists selected by the Spanish Society of Rheumatology. Three indicators were constructed from the items in the corresponding sections of the questionnaire: knowledge on the social impact (KSI), general knowledge (GK) and specific knowledge (SK) of MD. Indicators were expressed as an integer relationship between the score attributable to the sum of the responses of each individual with respect to the total score for each obtainable indicator. The criteria for the development of composite indicators are shown in [Table 1](#).

### Analysis

A descriptive analysis and univariate associations were performed of composite indicators according to the sections of the questionnaire variables. The level of significance was  $P<.05$ . Subsequently, a multivariate analysis was performed by multiple linear regressions. It became a model for each synthetic indicator as the dependent variable in the analysis, including those variables that had statistical association in the univariate analysis.

## Results

After making 31 289 phone calls and establishing contact in 13 837 occasions the interview was conducted to 1009 subjects. [Table 2](#) presents the description of the respondents according to sociodemographic variables. 51% of respondents were women and the most common age range was between 30 and 44 years (29.0%). The proportion of respondents was higher in the group with high school level (42.2%); those occupationally active (48.3%), among which the majority were qualified manual labor (42.8%), and residing in habitats of 10 000–50 000 inhabitants (24.6%).

The disease recognized by most respondents (60.3%) among the 3 most prevalent was myocardial infarction/angina, followed by cancer (60.0%) and low back pain (46.5%). Osteoarthritis and/or joint problems were recognized among the three most prevalent diseases by 35.6% of respondents and among the most disabling by

**Table 1**  
Criteria and Methodology for the Creation of Composite Indicators of Knowledge of MD.

Knowledge of social impact	Synthetic indicators of knowledge of MD	
	General knowledge	Specific knowledge
Knowing how to classify two MD which are among the most prevalent in terms of: Disease prevalence (0–2 points depending on no. identified MD). Number of sick leave episodes (0–2 points according to identified MD no.) Number of work disability episodes caused (0–2 points depending on no. identified MD) Identify aspects of social impact (one point for each aspect): work capacity (4 items) Social Cost (2 items) Assistance care (one item) Global prevalence (one item) Score is added and becomes rate by dividing it by the maximum obtainable score (14)	Recognize 9 MD from a list of 13 diseases (0–2 points) Recognize 8 symptoms of a list of 11 (0 to 2 points) In both cases, obtained by: ( $\Sigma[\text{hit}] - \Sigma[\text{errors}]$ )/(total possible successes/2] Spontaneously provide up to 3 names of MD (0–2 points, with 2 when: Hits – errors=3; 1 if it is 1 or 2, and 0 otherwise) Declare knowing “a lot/quite” of one of 9 most prevalent MD cited in the questionnaire: low back pain, arthritis, osteoarthritis, osteoporosis, rheumatoid arthritis, fibromyalgia, lupus, spondylitis and gout (0–2 points, and 0 when responding to 0, 1 if they intersect at 1, 2, 3 or 4, and 2 to more than 4) Recognize “much/a lot of” limitation of daily life, work and social activities, and purchasing power. (0–2 points, with 2 when recognized in more than 2) Score is added and becomes rate by dividing it by the maximum obtainable score (10)	Recognize in which age group (<45 years, 45–60, and >60 years) each of the nine MD is more prevalent (0–9 points) Recognize in which gender each of the nine MD is more prevalent (0–9 points) Provide up to 3 specific symptoms, according to the opinion of experts, for each of the 9 MD (0–3 points for each EME, 0–27 points in total) Score is added and becomes rate by dividing it by the maximum obtainable score (45)

MD, musculoskeletal diseases.

50.9%, while low back pain was recognized among the three most disabling 42, 8%. 79.2% recognized low back pain as the main cause of sick leave and 52.8% recognized osteoarthritis. In the responses to the variables related to social impact, the most recognized of the MD were related to impairment of earning capacity (91.5%) and social costs (72.1%), while 52.4% of respondents believe that MD were the most common diseases worldwide.

**Table 2**  
Description of Respondents According to Sociodemographic Variables.

	Gender				Total	
	Male		Female		No.	%
	No.	%	No.	%		
<b>Age</b>						
18–29	116	51.6	109	48.4	225	22.3
30–44	147	50.2	146	49.8	293	29.0
45–64	136	48.7	143	51.3	279	27.7
65+	91	42.9	121	57.1	212	21.0
Total	490	48.6	519	51.4	1009	100.0
<b>Habitat, no. inhabitants</b>						
Less than 10 000	108	22.0	127	24.5	235	23.3
From 10 000 to 50 000	127	25.9	121	23.3	248	24.6
50 001 to 100 000	50	10.2	61	11.8	111	11.0
100 001–500 000	130	26.5	109	21.0	239	23.7
Over 500 000	75	15.3	101	19.5	176	17.4
Total	490	48.6	519	51.4	1009	100.0
<b>Level of education completed</b>						
Uneducated	21	4.3	32	6.2	53	5.3
Primary	132	27.0	174	33.5	306	30.4
Middle school–high school	209	42.7	216	41.6	425	42.2
University	127	26.0	97	18.7	224	22.2
Total	489	48.5	519	51.5	1008	100.0
<b>Current labor situation</b>						
Active	294	60.0	193	37.2	487	48.3
Unemployed	55	11.2	65	12.5	120	11.9
Retired/pensioner	116	23.7	96	18.5	212	21.0
Housewife	0	0.0	123	23.7	123	12.2
Student	25	5.1	42	8.1	67	6.6
Total	490	48.6	519	51.4	1009	100.0
<b>Occupation (between assets/unemployed)</b>						
Unskilled manual	48	13.8	34	13.2	82	13.5
Qualified manual	157	45.0	103	39.9	260	42.8
Administrative	34	9.7	58	22.5	92	15.2
Directors	8	2.3	7	2.7	15	2.5
Professional	79	22.6	43	16.7	122	20.1
Business	23	6.6	13	5.0	36	5.9
Total	349	57.5	258	42.5	607	100.0

59.5% of the respondents knew something about MD, while 35.5% could not name any MD spontaneously. However, when asked about the list of 9 EME (Table 3), 981 persons reported having some knowledge about some of them (97.2%), although 84.5% of the respondents did not know anything about spondylitis and 87.5% knew nothing of lupus (which was not even named spontaneously). In the subgroup of 981 respondents who knew something of some MD, most recognized MD limited everyday life (93.6%), work (93.1%) and to a lesser extent, social life (73.4%) and purchasing power (64.7%) a lot or to some level. Given a list of suggested symptoms, over 90% associated joint pain, decreased mobility and joint inflammation with MD, while less than half considered them related to depression or anxiety disorders.

These same subjects answered questions on specific aspects of knowledge of MD, information that was transformed and quantified in the SK indicator. They also rated the quality of their information, most of them considering it poor or very poor (54.5%). The information available was considered as sufficient when referring to ‘what is’ the disease (71.3%), while considered only sufficient when referring to the drugs and their side effects in 37.3 and 31.6%, respectively.

According to the MD presentation in them or their families, 93.8% of respondents recognized MD due to their own condition (52.5%) and/or a relative/friend’s (84.4%) (Table 4). Of these, 70% said that MD limited the daily activity of the sufferer. Asked what professional should deal with MD, most responded that they should be treated by rheumatologists (68.8%) followed by trauma specialists (21.3%).

Table 5 describes the synthetic indicators of knowledge of MD and their distribution according to sociodemographic variables. SIK level was acceptable, with 75% of the sample with a score above 0.5 over 1. The average level of knowledge is  $0.62 \pm 0.16$ , being the indicator which obtained the highest scores regarding knowledge. GK level had an average value of  $0.50 \pm 0.17$  and SK was  $0.18 \pm 0.10$ , exhibiting low values compared with other synthetic indicators of specific knowledge. The indicators were correlated with each other, with the association between GK and SK being greater ( $\rho=0.547$ ). SIK had significantly higher values in men (0.64 versus 0.61 in women) and retirees (0.65). GK was higher in women (0.52), in those aged between 30 and 44 years (0.53), among the inhabitants of towns with fewer than 100 000 inhabitants (0.50), those with higher educational level (0.52), and those without a professional occupation of manual laborer ( $>0.50$ ). TSK was higher in women, middle-aged people with higher levels of education and non-manual occupations ( $P<.001$  in all). The association with work

**Table 3**  
Identification and Knowledge of MD.

Which MD(s) are you familiar with? Spontaneous replies	No.	%	Which one do you recognize as a MD? Responses from the questionnaire						How much do you know about it?			
			Yes		No		DNK/NA		Little/Nothing		Pretty much/A lot	
			No.	%	No.	%	No.	%	No.	%	No.	%
Low back pain	168	28.0	748	74.1	209	20.7	52	5.2	774	70.0	331	30.0
Osteoarthritis	165	27.5	951	94.3	41	4.1	17	1.7	800	70.9	328	29.1
Arthritis			888	88.0	85	8.4	36	3.6	729	77.1	217	22.9
Rheumatoid arthritis	108	18.0	929	92.1	34	3.4	46	4.6	620	78.2	173	21.8
Osteoporosis	75	12.5	765	75.8	163	16.2	81	8.0	678	76.3	211	23.7
Rheumatism <sup>a</sup>	64	10.7	–	–	–	–	–	–	–	–	–	–
Fibromyalgia	45	7.5	489	48.5	276	27.4	244	24.2	501	77.7	144	22.3
Spondylitis	13	2.2	222	22.0	243	24.1	544	53.9	175	84.5	32	15.5
Herniated disk	13	2.2	–	–	–	–	–	–	–	–	–	–
Sciatica	12	2.0	–	–	–	–	–	–	–	–	–	–
Tendinitis	9	1.5	–	–	–	–	–	–	–	–	–	–
Gout	7	1.2	417	41.3	494	49.0	98	9.7	682	78.5	187	21.5
Do not know/other	213	35.5	–	–	–	–	–	–	–	–	–	–
Lupus	–	–	83	8.2	446	44.2	480	47.6	224	87.5	32	12.5

MD, musculoskeletal diseases; NS/NC, do not know/no answer.

<sup>a</sup> Non-induced spontaneous replies.

status resembled the association with age, being lower for retirees (older) and students (younger).

Table 6 shows the multiple linear regression models of composite indicators. The SIK model explains about 10% of the variability of the indicator ( $r^2=0.095$ ). The greater the SIK was the greater is the GK and SK (maintaining this variable in the model to improve the explanatory power, even if their level of significance exceeded 0.05). It was higher in men, retirees and residents of less populated localities (maintained in the model to improve the explanatory power). It was also higher among those who considered themselves sufficiently informed as to “anything general” concerning MD, who had experience with limitations of daily life AND TO to those who have MD and, more specifically, arthritis and/or know someone that had it (kept in the model to improve the explanatory power).

The GK model explains 35.5% of its variability. GK increases with increasing SK and SIK as well as in patients with any of the 6 MD shown in Table 4, and even more so if they have had or knew someone who had had back pain, chronic back pain or arthritis. It was higher among those who were aware that MD presented a limitation for everyday life activities. However, the level of awareness was lower in men, in the most populated areas and in those who thought that the primary care physician was the one that should look after MD.

The SK model explains 42.6% of the variability. SK improved by improving GK and SIK and was greater the higher the age or educational level, whether the respondent knew someone who had a MD included in Table 3, especially if the disease was fibromyalgia, in the person or their acquaintances. SK was worse in men, retirees,

when the disease was chronic back pain or if no answer was provided as to who should treat MD or if they think that it should be the trauma specialist.

**Discussion**

This study is an approach to assess the level of knowledge of the Spanish population on MD. The information collected relates to knowledge of social and general knowledge of all the MD, specific or more prevalent MD. With this, secondary indicators were constructed on the knowledge level, quantified in 3 different planes, SIK, GK and SK, used to study its association with other variables.

According to the results, the level of knowledge of the Spanish population of the SIK in MD can be considered medium-high, the GK corresponds to an average level and the SIK to a limited level. The level of knowledge depends on the individual sociodemographic factors and personal experience with the presentation of MD, by the persons themselves or through acquaintances.

So, between sociodemographic factors, men scored higher in SIK, perhaps because this indicator inquired about labor and employment status and is a variable associated with the gender. However, most women know more on MD at the GK and SK levels, probably because, taken together, they present MD to a greater extent. Age was directly associated to a higher SK, since the probability of patients who have experienced or know someone who has experienced MD increases with age, and indirectly, SIK and SK levels were higher through the significance of the effect of being retired. A higher level of education was associated with improved

**Table 4**  
MD Presented by the Respondent or Family (no.=1.009).

	Do you know someone who has or has had. . . ?							
	No		Only yourself		Only some friend/family		You and friend/family	
	No.	%	No.	%	No.	%	No.	%
Low back pain	294	29.1	218	21.6	357	35.4	140	13.9
Arthritis	562	55.7	62	6.1	351	34.8	34	3.4
Osteoarthritis	363	36.0	117	11.6	478	47.4	51	5.1
Fibromyalgia	745	73.8	23	2.3	237	23.5	4	0.4
Chronic back pain	482	47.8	158	15.7	321	31.8	48	4.8
Gout	612	60.7	32	3.2	354	35.1	11	1.1
Others	–	–	–	–	–	–	11	1.1
Any of the above <sup>a</sup>	63	6.2	94	9.3	416	41.2	436	43.2

MD, musculoskeletal diseases.

<sup>a</sup> Refers to 7 MD of the table taken together.

**Table 5**  
Synthetic Indicators of the Level of Knowledge of MD. Breakdown by Socio-demographic Variables.

Synthetic indicator of knowledge	No.	Mean	SD	Min.	P25	Median	P75	Max.	Correlations				
									IS		CG		
									$\rho$	P	$\rho$	P	
Social impact (SIK)	1.009	0.62	0.16	0.14	0.50	0.64	0.71	1.00	–	–	–	–	
General (GK)	1.009	0.50	0.17	0.00	0.38	0.51	0.61	0.93	0.229	.000	–	–	
Specific (SK)	1.009	0.18	0.10	0.00	0.11	0.18	0.24	0.51	0.165	.000	0.547	.000	
		Social impact			General knowledge				Specific knowledge				
		No.	Mean	SD	P	No.	Mean	SD	P	No.	Average	DE	P
<b>Sex<sup>a</sup></b>													
Male	490	0.64	0.15	.001	490	–0.47	0.18	.000	490	0.17	0.10	.000	
Female	519	0.61	0.16		519	0.52	0.17		519	0.19	0.10		
<b>Age, years<sup>b</sup></b>													
18–29	225	0.62	0.15	NS	225	0.46	0.17	.000	225	0.16	0.10	.000	
30–44	293	0.62	0.16		293	0.53	0.16		293	0.20	0.10		
45–64	279	0.62	0.15		279	0.51	0.17		279	–0.21	0.10		
65+	212	0.64	0.18		212	–0.47	0.18		212	0.14	0.09		
<b>Habitat<sup>b</sup></b>													
Less than 10 000	235	0.63	0.16	NS	235	0.50	0.16	.051	235	0.17	0.10	.046	
From 10 000 to 50 000	248	0.63	0.15		248	0.52	0.18		248	0.18	0.10		
50 000–100 000	111	0.64	0.17		111	0.51	0.15		111	0.20	0.10		
100 000–500 000	239	0.62	0.16		239	–0.47	0.19		239	0.17	0.10		
Over 500 000	176	0.61	0.16		176	–0.49	0.17		176	0.19	0.10		
<b>Educational level<sup>b</sup></b>													
Uneducated	53	0.62	0.17	NS	53	0.41	0.18	.000	53	0.11	0.09	.000	
Primary	306	0.64	0.16		306	0.48	0.18		306	0.15	0.09		
Medium–high school	425	0.62	0.16		425	0.50	0.17		425	0.19	0.10		
University	224	0.62	0.15		224	0.52	0.15		224	0.22	0.10		
<b>Employment status<sup>b</sup></b>													
Active	487	0.62	0.15	.037	487	0.51	0.17	NS	487	0.19	0.10	.00	
Unemployed	120	0.61	0.15		120	–0.49	0.17		120	0.18	0.10		
Retired or pensioner	212	0.65	0.17		212	0.48	0.19		212	0.5	0.10		
Housewife	123	0.62	0.17		123	0.51	0.16		123	0.19	0.09		
Student	67	0.59	0.14		67	0.45	0.18		67	0.16	0.11		
<b>Occupation (if active/unemployed)<sup>b</sup></b>													
Unskilled manual	82	0.62	0.14	NS	82	0.45	0.19	.001	82	0.15	0.09	.000	
Qualified manual	260	0.63	0.16		260	–0.49	0.16		260	0.18	0.10		
Administrative	92	0.60	0.17		92	0.54	0.17		92	–0.21	0.10		
Directors	15	0.63	0.16		15	0.58	0.13		15	0.23	0.09		
Professional	122	0.62	0.15		122	0.53	0.16		122	–0.21	0.11		
Business	36	0.62	0.13		36	0.52	0.17		36	–0.21	0.09		

SD, standard deviation; MD, musculoskeletal diseases; Max., maximum; Min., minimum; NS, not significant; P25, 25th percentile; P75, 75th percentile; P, level of statistical significance;  $\rho$ m Pearson correlation coefficient.

<sup>a</sup> Hypothesis for mean difference.

<sup>b</sup> Contrast of hypotheses by analysis of variance.

SK, which is consistent with other studies<sup>4,6</sup> and the fact that the questions that make up this indicator were accurate, not related to general education and required a degree of education or experience. Finally, living in smaller populations is associated with increased SIK and GK.

As for personal experience, the SIK and GK levels are higher among those with MD, increasing with the experience, and for those who are limited in their daily lives because of them. SK is not associated with personal experience perhaps because it is unlikely that a person is exposed to over 2 MD (almost half of respondents did not have any, and just over a fifth had more than one). Instead, SK increases by increasing the number of persons who experienced MD indirectly by knowing persons who presented them. In fact, two-thirds of respondents knew at least 2 persons who had different MD, and less than half knew of at least 3 patients with different MD.

According to the MD in question, experience, direct and indirect, of its presentation is associated differently with knowledge levels. Osteoarthritis was associated with a higher level of SIK, arthritis, low back pain and chronic back pain were associated with a higher

level of GK, and fibromyalgia was associated with higher levels of SK, perhaps because the MD whose knowledge is less common is more discriminating in this indicator. Paradoxically, the experience related to chronic back pain was associated with lower levels of SK, perhaps because of the vagueness in the wording of the MD or that back pain is so prevalent that it is part of popular tradition.

Knowledge levels studied were correlated, with no collinearity, and covered different aspects with a different scope. Knowledge was vaguer, more widespread, and reaching higher scores is the SIK. In contrast, the SK, which refers to a better and more specific understanding, was less widespread and got worse scores.

Comparison with other studies is difficult because of the different designs and methodologies used in the literature. In this study, its design and methodology were determined by a different starting approach. For example, the target population is the general population, with and without MD while most studies focus on specific MD<sup>1,2,4</sup> concrete MD or, conversely, in population free of MD.<sup>3</sup> There are general population studies, but they are usually designed as educational interventions.<sup>5</sup> The fundamental difference with other studies is the operational definition of “knowledge



**Table 6**  
Multiple Linear Regression Models of Composite Indicators.

Variables	Beta coefficient	P	95% for Beta		R <sup>2</sup>
			LI	LS	
<i>Model for the dependent variable knowledge of synthetic indicator of social impact of the MD (SIK)</i>					
(Constant)	0.476	.000	0.435	0.516	0.095
Synthetic indicator general knowledge	0.128	.001	0.054	0.201	
Synthetic indicator specific knowledge	0.108	.075	−0.011	0.227	
Male	0.044	.000	0.024	0.063	
Retired	0.032	.019	0.005	0.058	
Have you or someone you know had any MD and has been limited in their daily lives?	0.028	.014	0.006	0.050	
Do you consider you are sufficiently generally informed as to all MD	0.022	.042	0.001	0.042	
Do you know someone with osteoarthritis	0.018	.098	−0.003	0.040	
Do they present one of the 6 MD	0.010	.049	0.000	0.020	
Habitat <sup>a</sup>	−0.006	.086	−0.013	0.001	
<i>Model for the dependent variable synthetic indicator of general knowledge of EMDE (GK)</i>					
(Constant)	0.234	.000	0.191	0.277	0.355
Synthetic indicator specific knowledge	0.783	.000	0.690	0.876	
synthetic indicator of social impact Knowledge	0.107	.000	0.050	0.165	
Do you or someone you know have had any MD limiting their daily lives?	0.033	.001	0.014	0.053	
Do you know someone else who has back pain	0.023	.036	0.002	0.044	
Do you know someone else who has chronic back pain	0.023	.015	0.004	0.041	
Do they present one of these 6 MD	0.020	.000	0.011	0.028	
Do you present or know someone else who has arthritis	0.017	.062	−0.001	0.035	
Habitat <sup>a</sup>	−0.006	.050	−0.012	0.000	
Male	0.016	.076	−0.034	0.002	
Comments that PC doctor is the one who must deal with MD	−0.029	.099	−0.064	0.006	
<i>Model for the dependent variable synthetic indicator of specific knowledge of the MD (SK)</i>					
(Constant)	0.044	.003	−0.072	−0.015	
Synthetic indicator general knowledge	0.243	.000	0.212	0.274	
synthetic indicator of social impact knowledge	0.054	.001	0.022	0.086	
Highest level of education completed <sup>b</sup>	0.027	.000	0.021	0.033	
Presents or know someone else who has fibromyalgia	0.025	.000	0.013	0.038	
Age recorded <sup>c</sup>	0.013	.000	0.007	0.020	
knows someone that has one of the 6 MD	0.009	.000	0.005	0.013	
Presents or knows someone else who has chronic back pain	0.010	.067	0.020	0.001	
Male	0.016	.002	−0.026	−0.006	
Comments that it is the orthopedist who must deal with MD	−0.026	.000	−0.038	0.014	
Do not know/no answer which doctor should treat MD	−0.035	.014	0.063	0.007	
Retired	−0.035	.000	−0.051	−0.019	

MD, musculoskeletal diseases; 95%, confidence interval 95%; LI, lower limit; LS, upper limit; P, level of statistical significance.

<sup>a</sup> As ordinal scale: where 0 in <10 000, 1 in 10 000–50 000, 2 in 50 000–100 000, 3 in 100 000–500 000, and 4 in >500 000 inhabitants.

<sup>b</sup> As ordinal scale, where 0=without studies, 1=primary, 2=secondary, and 3=university.

<sup>c</sup> As ordinal scale, with 0 of 18–29 years, 1 of 30–44; 2 of 45–64, and 3 of ≥65 years.

of MD” and, consequently, the nature of the results. The knowledge explored in this study refers to the socio-labor aspects and knowledge that people have of the MD epidemiological phenomenon (population) and its symptoms and consequences. Other studies, however, by addressing patients, have explored the knowledge of clinical aspects (etiology, pathophysiology, diagnosis, treatment and prophylaxis).<sup>2,3,5,7</sup>

The construction of synthetic indicators of level of knowledge, of which there is no precedent in the literature, limits the comparability of results. However, the usefulness of the indicators shows the extent to which they serve to synthesize, describe and interpret the information gathered and allow us to study the variability of the population according to them. The indicators have been constructed with a methodology that allows replication, according to the criteria of experts in MD, and satisfactorily describes the population according to the objectives. However, the variability explained by the multivariate models is limited. This suggests that the residual variability may be due to other variables not included in the models or different determinants on which information was not collected.

In short, the Spanish population has a medium level of knowledge of the importance of MD in terms of frequency and the

way they affect the performance of the activities of those who have them, and identify them sufficiently, knowing their symptoms broadly, but know little about them individually. The level of knowledge varies according to sociodemographic factors and direct and indirect experience with MD presentation.

**Ethical Responsibilities**

**Protection of people and animals.** The authors declare that this research has not been done in humans or animals.

**Data confidentiality.** The authors state that no patient data appear in this article.

**Right to privacy and informed consent.** The authors state that no patient data appear in this article.

**Funding**

This research was funded by Abbott Foundation. The work of Juan Angel Jover and Rosario García-Vicuña was partially funded

by the RETICS, RD08/0075 (RIER) research program of the Instituto de Salud Carlos III (ISCIII).

### Conflict of interest

No author has a conflict of interest.

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