

# Prevalence of musculoskeletal manifestations in the adult Brazilian population: a study using COPCORD questionnaires

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## Abstract

### Objective

To estimate the prevalence of musculoskeletal manifestations in the population of Vitória, Brazil, using the COPCORD questionnaire.

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### Methods

This was a cross-sectional study of 578 people with an age range of 18-65. The sample was probabilistic and stratified according to sex, age and socio-economic class, proportional to the 2000 demographic census data of the Brazilian Institute of Geography and Statistics – IBGE. The COPCORD core questionnaire was used for all subjects, and a rheumatologist evaluated those patients who presented pain and/or functional disability. Laboratory tests and radiographs were carried out in some patients to confirm the diagnosis.

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### Results

One hundred and seventy-six patients (30.4%) with a mean age of 41 (SD 13) and predominantly female had pain. Among the patients with pain, 23.2% were unable to do daily living activities. One hundred and thirty (73.9%) were evaluated by a rheumatologist.

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### Conclusion

The prevalence of musculoskeletal manifestations evaluated by the COPCORD questionnaire was 30.4%.

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### Key words

COPCORD, musculoskeletal diseases, musculoskeletal abnormalities, rheumatic diseases, joint diseases, prevalence.

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A PRONUCLEAR project of the  
Rheumatology Brazilian Society.

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Received on February 5, 2008;

accepted in revised form on June 19, 2008.

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## Introduction

Rheumatic diseases constitute a heterogeneous group of diseases with different severity levels which usually lead to disability (1-3). They are also the most prevalent chronic condition in developed and developing countries (4). Musculoskeletal complaints are the second greatest cause of doctor's appointments and in most countries they are the reason for more than 10 to 20% of primary health care (5). In spite of high prevalence, government health policies worldwide and medical schools give more importance to disease with a high mortality rate when compared to rheumatic diseases (6).

The COPCORD program (Community Oriented Program for the Control of Rheumatic Disease) was developed by the International League of Associations of Rheumatology (ILAR) in 1981 aiming at reducing the prevalence and the costs with rheumatic diseases in developing countries through improvement in diagnosis and care to the carriers of these conditions. The COPCORD program is designed in three stages. Stage 1 is a community-based epidemiological study. Stage 2 is aimed at educating health professionals to a more appropriate management of rheumatic disease treatment. Stage 3 is the identification of environmental and genetic risk factors of musculoskeletal disorders to prevent or minimize rheumatism.

Stage 1 (epidemiological study) includes three phases. In phase 1, people from one defined area are interviewed about musculoskeletal symptoms using the standard WHO-ILAR questionnaire, called COPCORD Core Questionnaires (CCQ). In phase 2, those who present musculoskeletal manifestations in the last 7 days with no trauma history, answer questions about Disability and they are also invited for an evaluation performed by a rheumatologist. Phase 3 includes complementary exams when needed by the rheumatologist to conclude the diagnosis.

The CCQ is an instrument of population tracking of musculoskeletal manifestations and is a reliable estimate of rheumatic disease prevalence (7). In 1997, CCQ was translated into Portuguese and was adapted and validated

for use in Brazilian communities with the main objective of assessing the translation, cultural adaptation and properties of measure reproductibility and validity of COPCORD in Brazil. Other objectives were to determine the specificity, sensibility and the number of clinical exams which could have been avoided in populational studies by using the CCQ. The Portuguese version replaced the functional disability questions of the original COPCORD by the Health Assessment Questionnaire (HAQ). The HAQ has an easy and fast application, with reproducibility and validity evidence and it had already been translated and validated into Portuguese. The HAQ results ranged from score 0 (no disability) to 3 (maximal disability) (7).

In the literature, 27 studies were found using COPCORD (4, 7-32). In Brazil, only one study was performed in a city located in another state (26). In a country with continental dimensions, studies should be carried out in different states.

Our main objective was to assess the prevalence of musculoskeletal manifestations in the adult population in Vitória, and secondly, to identify the presence of rheumatic diseases in the studied sample and classify the musculoskeletal manifestations by groups of diagnosis and levels of care complexity (primary, secondary and tertiary).

## Materials and methods

This was an epidemiological observational cross-sectional prevalence study in a population including 578 people aged 18-65 years (children and the elderly were excluded) who lived in Vitória, Espírito Santo in the southeast region of Brazil, using the COPCORD Core Questionnaire (CCQ) to find musculoskeletal manifestations. During the first part of the study, randomized home visits were performed from February to December 2004 in order to apply the COPCORD Core Questionnaire (CCQ). The interviewers were health care graduating students who had been trained in administering the interview. The first house to be visited in each region was located on the farthest right side of the map, on the right side of

Competing interests: none declared.

the street, proceeding right in an anti-clockwise direction and then skipping three houses between each visited one. Those who presented musculoskeletal manifestations in the last 7 days with no trauma history were invited for an evaluation by a rheumatologist (phase 2 of the study). In the second phase of the study, some of the participants assessed in the second part of the study needed to have either simple x-rays of joints or laboratory examinations (phase 3) for a more precise diagnosis. The same experienced rheumatologist evaluated all the patients.

The sample was probabilistic and stratified according to sex, age and socio-economic class, proportional to the 2000 demographic census data of the Brazilian Institute of Geography and Statistics – IBGE. In the socio-economic class definition, the monthly revenue of the person in charge of the house expressed in ranges based on the minimum wage (MW) was used. These ranges are the following: up to 2 MW (\$318,00), from 2 to 5 MW (\$318,00 to 795,00) from 5 to 10 MW (\$795,00 to 1.590,00) and more than 10 MW (\$1.590,00). We highlighted that the average obtained was 7.5 MW (\$1.193,18) with a standard deviation of 4.55 MW (\$723,86). Using procedures of the size of the sample related to a proportion in a population, considering the population size as infinite (large), desire precision of 4.5%, event prevalence of 30%, significance level of 5%, we calculated the sample size in 399 individuals and a standard error of 40% in the final sample (160 individuals). The minimum number of individuals in the calculated sample was 559.

The study was approved by the Research Ethics Committee of the Federal University of Espírito Santo, all the participants were informed about the research and gave written informed consent.

The data obtained from questionnaires-CCQ were stored in an Excel (Microsoft Office) program and later the data analysis was made using the Statistical Package for the Social Sciences program (SPSS) 8.0.

A descriptive statistic of population characteristics was performed. The chi-square test was used to obtain an

analysis of association of having musculoskeletal complaints or not. For the quantitative variables, the student's *t*-test was used, while for those without normal distributions, the Mann Whitney test was used. For all tests, the significance level used was  $\alpha=0.05$ .

### Results

A total of 578 participants were interviewed: 56.1% (324) were women; 44.6% (258) regarded themselves as white, 51.9% (300) non-white; 47.2% (273) were married, 40.1% (232) single, 3.1% (18) widow(er), 7.4% (43) divorced or separated. The distribution by socio-economic classes showed that 25% (147) belonged to class A, 30.8% (178) to B, 36.3% (210) to C and 5.9% (34) to D; the age ranged from 18 to 65 with a mean of  $36.19\pm 13.24$  years. The small participation of class D in the sample corresponds to the proportion of this class in the population of Vitória, according to IBGE data.

Of the 578 participants interviewed, 176 (30.4%) showed some musculoskeletal manifestations in the last 7 days which were not related to trauma. People who did not have current pain were asked whether they had had any musculoskeletal manifestations in the past (before the last 7 days). Seventy-six (13.1%) people answered "yes" for pain, with no trauma history.

The frequencies of musculoskeletal

manifestations correlated to colour, marital status, gender and income are shown in Table I. People with pain were 40.88 (13.50) years old, and those with no pain were 33.62 (12.44) years old. Older (Student's *t*-test,  $p<0.001$ ) and women (Chi-square test,  $p<0.001$ ) had more pain. Regarding the socio-economic class, no statistically significant difference was found among the A, B, C and D classes ( $p=0.287$ ). For the colour ( $p<0.05$ ) and marital ( $p<0.05$ ) status variables we have found an association with pain.

Among those interviewed who had pain currently or in the past (previously), a total of 336 individuals answered the question on limitation of daily living activities (DLA) related to musculoskeletal manifestations and 78 (23.2%) of those were limited to their activities at the moment of the interview, 86 (25.6%) had been limited in the past, and 172 (51.2%) had never been disabled. Time of limitation ranged from less than one day to several years. Most people reported disability superior to one year. It was observed that there were more disabled people among the older participants ( $p\leq 0.001$ ). There is no difference in frequency of disability related to gender, socio-economic class and marital status. Older people were more disabled ( $p\leq 0.05$ ). In spite of this, there is no difference in the number of disable people between sexes; women

**Table I.** Percentage of musculoskeletal manifestations through gender, colour, marital status and socio-economic class.

Population class	With pain	Total	Statistical significance
Gender			$p=0.001$
Female	124 (41.8%)	297 (100%)	
Male	52 (22.7%)	229 (100%)	
Color			$p=0.009$
White	64 (27.1%)	236 (100%)	
Non-white	108 (39.9%)	271 (100%)	
Marital status			$p=0.002$
Single	52 (24.3%)	214 (100%)	
Married	100 (40.3%)	248 (100%)	
Widow(er)	07 (46.7%)	15 (100%)	
Separated/divorced	15 (40.5%)	37 (100%)	
Socioeconomic class			$p=0.287$
A	39 (28.7%)	136 (100%)	
B	54 (33.5%)	161 (100%)	
C	68 (35.2%)	193 (100%)	
D	13 (46.4%)	28 (100%)	

had worse scores compared to men ( $1.25 \pm 0.6752$  vs.  $0.83 \pm 0.52$ ,  $p < 0.05$ ). Of the 78 people interviewed who declared being incapable at the moment of the interview, 76 (97.4%) completed the HAQ questionnaire. The majority of the sample (51.3%) obtained scores up to 1 (mild disability), followed by 26 (34.2%) with scores between 1.1 and 2 (moderate disability) and, finally, those more incapable with scores from 2.1 to 3 were 4 (5.3%). The median was 1 (0.63-1.63).

In phase 2 (rheumatologist's evaluation), 176 participants who presented manifestations in the last 7 days with no trauma were invited to undergo an evaluation. Of those, 73.86% (130) were evaluated by the same rheumatologist. The non-evaluated 26.14% (46) refused the invitation made by the interviewer, did not answer the phone calls (at least 3), mail correspondence or home visit. The 130 who accepted the invitation were evaluated by their clinical history, general physical and musculoskeletal examinations and 10% of them needed to have radiographs or laboratory exams which included complete blood cell count, erythrocyte sedimentation rate, rheumatoid factor, thyroid-stimulating hormone and thyroxine (phase 3). After the performance of phase 2 and (or) 3, the 130 assessed individuals were classified in groups of diagnosis: 1) Low back pain; 2) Non-specific Arthralgia and Myalgia; 3) Diffuse muscle pain; 4) Osteoarthritis; 5) Soft tissue disease; 6) Inflammatory autoimmune disease. Some patients were included in more than one group as they had more than one complaint. This explains why the sum of frequencies of each group is superior to 130 (the number of assessed individuals). The distribution of these diagnoses in the studied sample is shown in Table IV. Diffuse pain was found in 32 individuals and 10 of them had ACR 90 criteria for fibromyalgia, with eleven or more "tender points". The 10 individuals with fibromyalgia were female. A single patient with the diagnosis of rheumatoid arthritis who was already receiving treatment by a rheumatologist was classified in the group of inflammatory joint diseases. Other autoimmune

**Table II.** Frequency of diagnosis among subjects sample with pain.

Diagnosis	n.	Subjects with pain (176)	Total sample (578)
Low back pain	42	23.9%	7.3%
Soft tissues	25	14.1%	4.3%
Diffuse pain	Fibromyalgia (ACR 90)	10	5.7%
	Non Fibromyalgia	22	12.5%
Osteoarthritis	29	16.5%	5.0%
Arthritis /Autoimmune diseases	01	0.6%	0.2%
Nonspecific Arthralgia / Myalgia	38	21.6%	6.6%
Missing (people not surveyed)	46	26.14%	-
Total musculoskeletal pain	176	100%	30.4%

diseases were not found in the sample. Group 2 was composed of individuals who had complaints of joint pain or myalgia without a detected inflammatory component or non-generalized muscle pain and without weakness. None of them showed any systemic or constituting symptoms and no diagnosis was found during the study.

In the studied sample, low and medium complexity diagnoses were found in 99.8% and 0.2% of the sample, respectively.

### Discussion

The prevalence of musculoskeletal manifestation found in this study for the adult population of Vitória-ES was 30.4%. In studies using CCQ in several countries in the world the prevalence ranged from 13.3% in one study in China (21) to 46.3% in Mexico (7). Therefore, the current study is in accordance with the literature having the same result as the last published Brazilian study.

Disability caused by symptoms occurred in 23.2%. This is also in accordance with the published data which range from 2 to 39%. Most of the studies showed rates greater than 20%. The duration of disability was extended for more than a year in 32.1% of the disabled individuals. When the pain conditions of the past were evaluated (>7 days) these symptoms caused disability in 25.1% and, in this case, most individuals were also disabled for more than a year. These data confirm the importance of musculoskeletal manifestations as a cause of disability and reduction of the capacity to work.

The most prevalent diagnoses in the sample in a decreasing order of frequency were low back pain, non-specific pain; diffuse muscle pain, osteoarthritis and soft tissue disease. These are also the most predominant diagnoses in other studies using CCQ. These diseases have a great epidemiological importance for its high frequency as well as for its distress level and disability. We have found in our sample 99.8% of low complexity cases which can be carried out by primary care in basic care units or by the family physician since health care providers have a basic knowledge of rheumatic diseases. Only 0.2% had a condition of medium complexity (an individual with rheumatoid arthritis) that needs to be followed by a rheumatologist in a secondary level of care. The conditions of high complexity, *i.e.* those who require hospital care and more sophisticated investigation do not appear in the studied sample. Our sample was too small to detect conditions of high complexity due to its lesser prevalence. However, it is clear that the great majority of individuals in our population who present musculoskeletal manifestations can be treated at primary levels of care.

Women and the elderly presented more pain. The prevalence of the majority of rheumatic diseases is higher in the female gender, especially in diffuse pain such as fibromyalgia. Osteoarthritis is one of the most prevalent rheumatic diseases and is more frequent in the elderly than in the young. Socio-economic class was not associated with pain.

The small participation of class D income in the study sample corresponds

to the proportion of this class of income in the population of Vitória according to IBGE data. The most likely explanation for this demographic data is the fact that Vitória is a small island, the capital of the state where predominantly rich people live. Those with a lower socio-economic level live in the nearby cities.

The sample (n=578) was calculated to obtain musculoskeletal pain prevalence. This sample is not large enough to calculate each specific rheumatic disease. That is why we presented diagnosis (e.g. low back pain, fibromyalgia, soft tissue) as frequency (percentage). This study may serve as a baseline to future research on rheumatic disease prevalence.

This study confirms that almost one third of the Brazilian population present musculoskeletal manifestations and that the most frequent diseases are low back pain, diffuse muscle pain/fibromyalgia, osteoarthritis and soft tissues disease with a frequency of 7.3%, 5.5%, 5.0% and 4.3% respectively. The large majority of the sample had low complexity disease that could be treated by general practitioners.

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