

# Rheumatic Diseases in Chihuahua, México

## A COPCORD Survey

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**Background:** Rheumatic diseases (RDs) represent a global problem for health care systems and patients. Community Oriented Program for Control of Rheumatic Diseases (COPCORD) is a low-cost screening tool for detecting musculoskeletal (MSK) pain and RDs.

**Objective:** The aim of this study was to examine the pattern of MSK pain and RDs in clinic population in Chihuahua City, Mexico.

**Methods:** A cross-sectional study was conducted in 7 primary health clinics using the COPCORD methodology in subjects older than 18 years. People with MSK pain not induced by trauma (positive cases) were evaluated by primary care physicians and rheumatologists.

**Results:** The study included 1006 individuals with a mean age of 46.0 (SD, 15.8) years; 751 (74.7%) were women. Musculoskeletal pain in the previous 7 days was reported by 571 individuals (56.75%; 95% confidence interval [CI], 53.8%–60.1%), and 356 cases (35.4%; 95% CI, 32.5%–38.4%) were COPCORD positive. The mean pain intensity in visual analog scale was 6.62 (SD, 2.4). The most common painful joint was the knee (54.7%; 95% CI, 51.1%–59.0%). Two hundred eighty subjects with MSK pain (49.0%) previously sought medical attention, and 375 (65.7%) were under treatment. Functional impairment was reported by 69.8% of the COPCORD-positive subjects. The prevalence of RDs was 21.4% (95% CI, 18.9%–23.8%). The most prevalent disease was osteoarthritis (10.3%; 95% CI, 8.6%–12.4%), followed by regional pain syndromes (5.5%; 95% CI, 4.1%–7.0%), rheumatoid arthritis (1.4%; 95% CI, 0.8%–2.2%), and mechanical low-back pain (1.4%; 95% CI, 0.7%–2.2%).

**Conclusions:** Musculoskeletal pain is an important problem that affects our community. The data provided in this study will be presented to the local authorities to help in the development of prevention strategies.

**Key Words:** disability, musculoskeletal, osteoarthritis, pain, rheumatic

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Rheumatic diseases (RDs) represent a burden to the societies worldwide. They constitute a group of clinical conditions that affect the musculoskeletal (MSK) system.<sup>1,2</sup> Their principal symptoms are pain, stiffness, and swelling. These symptoms and their consequent complications significantly reduce the life expectancy and quality of life of the affected.<sup>3</sup>

Rheumatic diseases entail a high cost for both health care system and patients. Their costs depend on the severity and type of the disease.<sup>4–6</sup> Epidemiology data for specific populations could help in the design of prevention strategies to reduce costs and achieve optimized health coverage.<sup>7</sup>

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The Community Oriented Program for Control of Rheumatic Diseases (COPCORD) was developed by the World Health Organization and the International League of Associations for Rheumatology. COPCORD was proposed as a screening tool for MSK pain in developing countries.<sup>2</sup> It has 3 main stages. The first stage is also divided in 3 phases: the evaluation of pain (intensity, location, association to trauma, and treatment), clinical assessment of the positive cases (pain without trauma history), and the medical approach by a rheumatologist. Second and third stages are about situational diagnosis and design of prevention programs.<sup>8–10</sup>

COPCORD has been used internationally in the last 30 years, and its accuracy has been proven with satisfactory results.<sup>2</sup> In Mexico, this program has been applied in the states of Nuevo León, Yucatán, Sinaloa, Distrito Federal, and Chihuahua. The prevalence of pain found in these studies varies between 7.1% and 43.7%. The most prevalent specific disease per region was osteoarthritis (OA) in all cases. However, significant variations were found in specific diagnoses.<sup>3,11–13</sup> The Chihuahua survey was developed in Aldama City, which is a semirural community nearby the capital city (Chihuahua). Its population at the time of the survey (2010) was 22,302 (0.65% of the state population).<sup>14</sup> In that COPCORD study, 13% of the interviewed reported pain in the last 7 days. Osteoarthritis was the most common RD (20.5%), but a relatively high prevalence of rheumatoid arthritis (RA) of 1.9% was also described. As many regional variations were seen in the previous researches, it is important to establish the characteristics of each population.<sup>3</sup>

It has been reported that 5.5% of the Chihuahua population has some kind of functional impairment, of which 36.4% are associated with some disease<sup>15</sup>; however, the epidemiological data of prevalence of MSK pain and RDs have not been previously reported for Chihuahua City. Therefore, the aim of this study was to examine MSK pain and RDs in individuals older than 18 years who are beneficiaries of the Mexican Popular Healthcare System in Chihuahua City.

## MATERIALS AND METHODS

### Participants

A cross-sectional study was performed using the Mexican COPCORD Core Questionnaire (CCQ) from September 2014 to April 2015. This study aimed to assess RDs in individuals older than 18 years who are beneficiaries of the Mexican Popular Healthcare System (Spanish: *Seguro Popular*), who receive medical care at community clinics of Chihuahua City. For this purpose, the Chihuahua's Department of Health authorized the study in 7 community clinics in Chihuahua City.

### Inclusion Criteria

The subjects included in the sample were present in the clinics' waiting rooms and verbally agreed to answer the CCQ after an explanation of the procedure.

## Sampling Design

The sample size was calculated using the formula for finite population. Chihuahua City had 819,543 inhabitants in 2010 (24.05% of the state's total population).<sup>16</sup> In Chihuahua, 87,342 families belong to the Popular Healthcare System. The confidence level was calculated at 95% with a margin of 5% and a probability level of 0.5. The estimated value was 385; still the size was amplified to 1000 in order to have a more representative sample.

## Screening Tool

The CCQ was previously adapted and validated in Mexican population by Goycochea-Robles et al<sup>17</sup> to detect MSK pain.

## Interview

### Phase 1: CCQ Application

Medicine students and health care-related personnel were recruited for the survey application. There were a total of 10 interviewers previously trained for the application of CCQ. They applied the CCQ in the clinic's waiting room of the community clinics at Chihuahua City.

### Phase 2: Clinical Evaluation by Primary Care Physicians

The CCQ was considered positive when individuals reported nontraumatic MSK pain of greater than 1 on a visual analog scale (VAS) during the last 7 days.<sup>3,17</sup> A physician examined all CCQ-positive individuals at the moment of the identification. When this was not possible, the patients were scheduled later. The medical assessment consisted of a medical history. The results of this phase allowed the physician to classify the patients in 2 main groups: suggestive inflammatory or noninflammatory diseases. The first group included RA, gout, spondyloarthritis, connective tissue diseases, and undefined arthritis. The second group comprised OA, fibromyalgia, regional pain syndrome (RRPS), mechanic low-back pain, osteoporosis, and non-RDs (vascular dysfunction or neuropathic disease). All of the diagnoses were established under the basis of the current accepted classification criteria.<sup>18-22</sup> A board-certified rheumatologist clinically assessed suggestive cases of inflammatory disease.

### Phase 3: Clinical Evaluation by a Rheumatologist

To confirm the diagnosis, the rheumatologist evaluated subjects with suspected inflammatory RD. If necessary, these patients underwent laboratory and radiographic studies. They also received medication according to their disease. The noninflammatory disease cases were sent to their family physician for follow-up with full information of their disease and care advice.

## Ethical Aspects

This study was approved by the ethical committee of the Medicine School of the Autonomous University of Chihuahua. The study also was approved by the Health Department (Spanish: *Secretaría de Salud*) of Chihuahua's government. This institution authorized the survey in the selected community attention clinics. For the CCQ application, all participants were invited to voluntarily participate in the study. A verbal consent was obtained from subjects who agreed to answer the questionnaire. If a patient needed to be evaluated by a specialist, an informed consent was signed; confirmatory tests including blood samples or imaging tests were used if required. The entire process, including interviews, medical examination by a physician and rheumatologist, and laboratory or radiographic studies (when necessary),

was conducted in health centers of the Health Department of Chihuahua's government.

## Statistical Analysis

The statistical analysis was made in IBM SPSS Statistics for Windows, Version 21.0 (IBM Corp, Armonk, NY). The analysis yielded measures of central tendency and dispersion for continuous variables. In addition, absolute and relative frequencies for ordinal, nominal, or categorical variables were used. Prevalence (%) and 95% confidence interval (CI) were calculated for the variables of the CCQ. Prevalence was calculated dividing the total number of patients with RD by the population surveyed.

## RESULTS

The sociodemographic data of this study are shown in Table 1. One thousand and six interviews were included. Women comprised 74.7% of the total surveyed population. The mean age was

**TABLE 1.** Sociodemographic Data

Variable	n = 1006; n (%)
Total population (n)	1006
Age, mean (SD); range, y (n = 1006)	46.0 (15.8); 18–87
Women	751 (74.7)
Age, mean (SD); range, y (n = 751)	45.2 (15.5); 18–87
Men	255 (25.3)
Age, mean (SD); range, y (n = 255)	48.3 (16.5); 18–85
Distribution by communitarian center	
CAAPS	479 (47.6)
Age, mean (SD); range, y/women, n (%)	44.1 (14.2); 18–79/362 (75.6)
Cerro Prieto	54 (5.4)
Age, mean (SD); range, y/women, n (%)	42.2 (13.4); 18–73/47 (87.0)
Nombre de Dios	20 (2.0)
Age, mean (SD); range, y/women, n (%)	53.1 (14.1); 24–78/15 (75.0)
Revolución	29 (2.9)
Age, mean (SD); range, y/women, n (%)	58.7 (13.5); 29–83/22 (75.9)
San Felipe	321 (31.9)
Age, mean (SD); range, y/women, n (%)	48.1 (17.6); 18–87/226 (70.4)
San Jorge	82 (8.2)
Age, mean (SD); range, y/women, n (%)	45.5 (15.7); 19–80/66 (80.5)
Tierra y Libertad	21 (2.1)
Age, mean (SD); range, y/women, n (%)	44.4 (17.9); 19–81/13 (61.9)
Occupation (n = 224) <sup>a</sup>	
Domestic service/housekeeping	120 (53.6)
Seller/employee	38 (17.0)
Laborer/industry	30 (13.4)
Retired/student	17 (7.6)
Construction	11 (4.9)
Farmer	6 (2.7)
Other	2 (0.9)

<sup>a</sup>The question was formulated to the COPCORD-positive cases (n = 356), of which only 224 responded (224/356 = 0.63).

CAAPS, advanced center for primary health care.

**TABLE 2.** Characteristics of Subjects With Reports of MSK Pain in the Last 7 Days

Variable	n = 1006, n (%; 95% CI)
MSK pain in the last 7 d	571/1006 (56.8; 53.8–60.1)
Trauma related	215/571 (37.7; 33.6–41.7)
Non-trauma related	356/571 (62.3; 58.3–66.4)
Pain intensity, mean (SD)	6.6 (2.4)
Medical attention	280/571 (49.0; 44.8–52.8)
Treatment	375/571 (65.7; 61.8–69.5)
NSAIDs	305/375 (81.3; 77.3–85.2)
Acetaminophen	81/375 (21.6; 18.1–25.5)
Supplements <sup>a</sup>	55/375 (14.7; 11.5–18.1)
Pain adjuvants <sup>b</sup>	12/375 (3.2; 1.6–5.1)
Opioids	10/375 (2.7; 1.1–4.5)
Steroids	5/375 (1.3; 0.3–2.4)
DMARDs	5/375 (1.3; 0.3–2.6)
Others <sup>c</sup>	27/375 (7.2; 4.3–10.0)
Medical prescription	274/375 (73.1; 69.1–77.3)
Self-medication	101/375 (26.9; 22.7–30.9)

<sup>a</sup>Calcium and vitamin B complex.

<sup>b</sup>Gabapentin, pregabalin, muscle relaxant.

<sup>c</sup>Allopurinol and nonspecified.

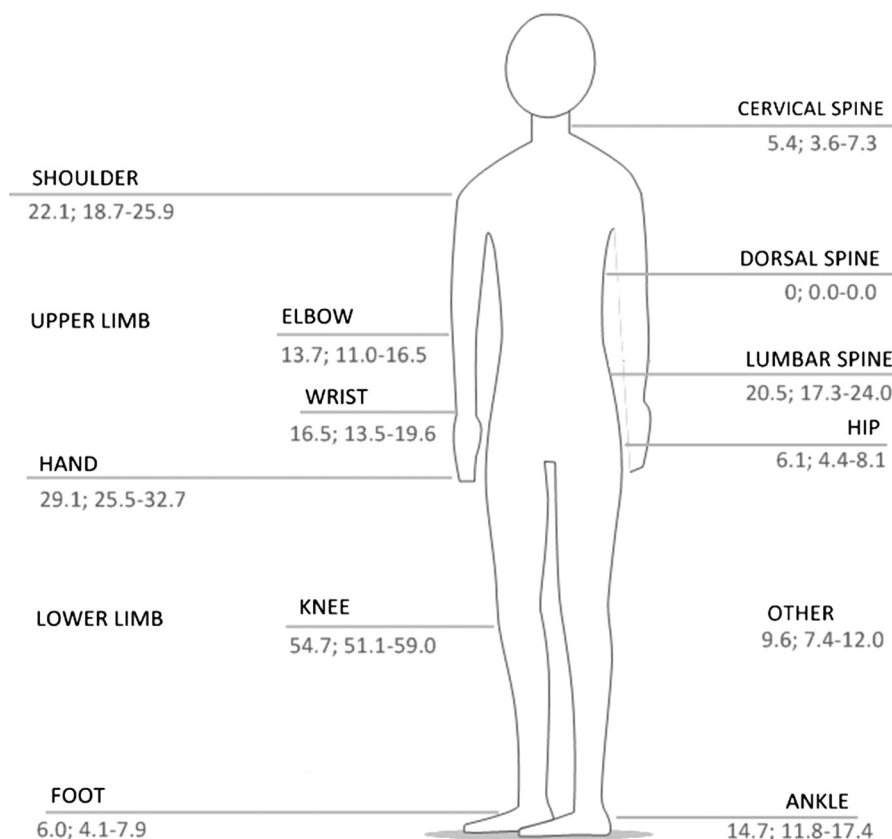
DMARDs indicates disease-modifying antirheumatic drugs.

46.0 years. The most common occupation was domestic work in 53.6% of the respondents (120/224), followed by employee work in 17.0% (38/224) and laborer in 13.4% (30/224) (Table 1).

A total of 571 patients (56.8%) reported MSK pain in the last 7 days (Table 2), and 356 cases (35.4%; 95% CI, 32.5%–38.4%) were considered COPCORD positive. The mean VAS pain intensity was 6.6 (SD, 2.4). In regard to the affected joints, the knees were the most affected site (54.7%), followed by the hands (29.1%) and shoulders (22.1%) (Figure). Two hundred eighty (49.0%) of the individuals with MSK pain had sought medical attention. The most used medication was nonsteroidal anti-inflammatory drugs (NSAIDs) (81.3%). The treatment was prescribed by a physician in 274 cases (73.1%), and unfortunately, 101 individuals (26.9%) were self-prescribed (Table 2).

The characteristics of COPCORD-positive subjects are described in Table 3. The mean VAS pain intensity for these individuals was 7.0 (SD, 2.3). Sixty-nine percent of them had allopathic treatment, whereas 24.5% used alternative medication. Twenty-six individuals (11.8%) reported family history of rheumatic symptoms. Functional impairment was reported by 69.8% of the COPCORD-positive subjects. Only 72.7% (259/356) of COPCORD-positive subjects completed their medical care until a definitive diagnosis was established; whereas the remaining patients could not be diagnosed because of the lack of commitment to attend subsequent medical appointments or laboratory studies. It was of interest that only 67 patients (18.8%) of the total positive COPCORD cases had an established diagnosis prior to our investigation.

The prevalence of RDs was 21.4% (95% CI, 18.9%–23.8%). The most prevailing group diseases were the noninflammatory diseases of which OA affected 10.3% of the total studied



**FIGURE.** Body regions most frequently affected by pain in the last 7 days. Prevalence rates are shown as percentage; 95% CI.

**TABLE 3.** Characteristics of COPCORD-Positive Subjects

Variable	n = 356, n (%; 95% CI)
Pain intensity, mean (SD)	7.0 (2.3)
Medical attention	196/356 (55.1; 50.0–59.9)
Treatment	249/356 (69.9; 64.9–74.5)
NSAIDs	211/249 (84.7; 79.9–89.6)
Acetaminophen	52/249 (20.9; 14.9–25.9)
Supplements <sup>a</sup>	42/249 (16.9; 12.0–22.0)
Pain adjuvants <sup>b</sup>	9/249 (3.6; 1.6–6.3)
Opioids	5/249 (2.0; 0.4–3.6)
Steroids	5/249 (2.0; 0.5–4.0)
DMARDs	5/249 (2.0; 0.4–4.0)
Others <sup>c</sup>	15/249 (6.0; 3.2–9.1)
Medical prescription	190/249 (76.3; 70.0–81.9)
Self-medication	59/249 (23.7; 18.1–30.0)
Use of alternative treatment <sup>d</sup>	58/236 (24.5)
Family history of rheumatic symptoms <sup>d</sup>	26/220 (11.8)
Functional impairment <sup>d</sup>	157/225 (69.8)
Mild	44/157 (28.0)
Moderate	60/157 (38.2)
Severe	53/157 (33.8)

<sup>a</sup>Calcium and vitamin B complex.

<sup>b</sup>Gabapentin, pregabalin, muscle relaxant.

<sup>c</sup>Allopurinol and nonspecified.

<sup>d</sup>The question was formulated to the COPCORD-positive cases (n = 356), but not everyone agreed to respond.

DMARDs indicates disease-modifying antirheumatic drugs.

population. Although inflammatory RDs affected only 3.2%, they were found to have a higher mean pain intensity (VAS, 7.2) and physical limitation (up to 90%) than in noninflammatory disease patients. Rheumatoid arthritis was the most prevalent inflammatory disease, with a prevalence of 1.4% (95% CI, 0.8%–2.2%) (Table 4).

## DISCUSSION

Previous research in Mexico has shown a notable prevalence of MSK pain, with local variations between cities.<sup>3,11,22,23</sup> In the state of Chihuahua, an earlier survey was made in Aldama City population; however, Chihuahua City had not been surveyed. Our study, unlike the vast majority of studies using the methodology COPCORD, has the peculiarity that the prevalence of MSK pain and RDs was determined in a clinical population. This allowed us to examine a population that had the benefit of a public Popular Healthcare System. Surprisingly, even though our surveys were conducted with individuals who receive medical care at community attention clinics of Chihuahua City, we found prevalence rates of 56.8% and 21.4% of MSK pain and RDs, respectively.

Although our study is not a community survey, the strategy for the detection of MSK pain and RDs is equivalent to that applied in community studies in Mexico. Overall prevalence found in our study was higher than that reported in the biggest epidemiological study of RDs in Mexico.<sup>3</sup> The prevalence of MSK pain is higher than that reported by other Mexican populations (ranging from 7.1% to 43.7%) including Aldama City population (13.0%).

Even when our study was conducted with patients who have medical coverage, and they were in the health centers at the time of the interviews, only 49% of patients with present pain in the last 7 days had gone for medical assistance to treat their discomfort.

However, 65% of the patients with pain had a treatment established. Musculoskeletal pain is frequently treated on the basis of self-medication, which was reported to have reached 26.9%. By far the most common self-prescribed drugs for MSK pain were NSAIDs (81.3%), which unexplainably are available without medical prescription at full therapeutic doses in Mexico; the rate for self-prescription of NSAIDs in our population is consistent with other studies in our country.<sup>3</sup> Self-prescription represents a potential risk for the patient's health. In this specific case, with NSAIDs as the most used drugs, gastrointestinal and renal complications may occur.<sup>24–26</sup> In patients with non-trauma-related MSK pain, the use of alternative medicine was reported by 24.5%, whereas the epidemiological study in Mexico reported 1.3%.<sup>3</sup> The high use of this type of medication could be related to the socioeconomic level of the studied population and also to cultural intertias. Even when the economic income was not considered as part of the study, we could infer that our population has a low socioeconomic level because of the type of health coverage used by them. They may seek the alternative treatment because it represents a lower cost rather than buying another treatment options.

The COPCORD-positive individuals reported a high functional impairment (69.8%), and 33.8% of them perceived this disability as severe. However, despite these rates and although 55.1% of these individuals had sought for professional help, only 18.8% had a diagnosis established. This could mean that there are multiple cases of RDs that are underdiagnosed, which at some point could end with some type of disability. Importantly, our results uncover a potential area of opportunity for the Popular Healthcare System to improve the skills of primary care physicians in the detection of patients with potential RD, and in this way, these patients can be directed to the rheumatologist for a definitive diagnosis and early treatment. Early accurate referral of patients with inflammatory RD has become a primary objective in modern rheumatology and requires continual medical education to primary care physicians; such referral is crucial to gain advantage of the therapeutic windows, especially at early stages. As can be noted, the situation in Chihuahua is far from ideal.

**TABLE 4.** Prevalence of RDs and MSK Disorders

Diagnosis	n (%)	95% CI
COPCORD negative	747 (74.3)	71.6–76.8
RD		
OA	104 (10.3)	8.6–12.4
RRPS	55 (5.5)	4.1–7.0
RA	14 (1.4)	0.8–2.2
Mechanic low-back pain	14 (1.4)	0.7–2.2
Fibromyalgia	9 (0.9)	0.4–1.6
Gout	8 (0.8)	0.3–1.4
Nonclassified arthritis	3 (0.3)	0.0–0.7
Ankylosis spondylitis	3 (0.3)	0.0–0.7
Systemic lupus erythematosus	3 (0.3)	0.0–0.6
Juvenile idiopathic arthritis	1 (0.1)	0.0–0.3
Reactive arthritis	1 (0.1)	0.0–0.3
MSK disorders		
Associated with neurologic disorders	29 (2.9)	2.0–4.0
Associated with vascular disorders	11 (1.1)	0.5–1.8
Osteoporosis	4 (0.4)	0.1–0.8

RRPS indicates rheumatic regional pain syndrome.

In our study, OA was the most prevalent RD (10.3%), and the prevalence of RA was 1.4%. These findings, like those found for other RDs, are generally consistent with prevalence rates reported in other regions of Mexico including Aldama City,<sup>3</sup> and specifically the RA prevalence was found to be greater than that reported in the world population (0.23%).<sup>27</sup>

Although our results provide valuable data of our population, the limitations of our study are worth mentioning. Even if the study was limited to gathering information from community clinics of Popular Healthcare System in Chihuahua, leaving aside the population of people who have other medical coverage and those who have none, nevertheless the population attending these centers is the most representative of Chihuahua City. Moreover, although 2 of the largest health centers in the city were included, it was not possible to survey the beneficiaries from all community clinics of this health care system, so sampling bias could affect our results.

In addition, only 72.7% of COPCORD-positive patients completed their medical care until a definitive diagnosis, whereas the remaining patients could not be diagnosed because of the lack of commitment to attend subsequent medical appointments or laboratory studies. Therefore, the prevalence in our study could be underestimated. This lack of interest of patients to reach a diagnosis may reflect the reason why our findings show that although our survey respondents have medical care, there is a high prevalence of MSK pain and a low percentage of individuals with a definitive diagnosis and an optimal treatment.

The fact that the rheumatologist assessed only the inflammatory diseases was also a limitation. The patients with non-inflammatory diseases could have needed a follow-up by a rheumatologist, although such follow-up was given by a general practitioner. Moreover, RRPS was diagnosed under the clinical judgment of non-rheumatologist physicians, which could lead to underestimation or overestimation of this disease.

Our research allowed us to establish a definitive diagnosis in 192 patients previously not diagnosed (74.7% new diagnoses). Moreover, our study allowed gathering important information about the diseases of the MSK system in the population benefited by the Mexican Popular Healthcare System in Chihuahua City. This medical service provides coverage to much of the national (15,394,890 families), state (408,892 families), and municipality (87,342 families) population.<sup>16</sup> The data found show a high prevalence of MSK pain and a high rate of functional impairment in patients reflecting the impact of these diseases in the population. This information can be used to design goal-oriented prevention and therapeutic programs for this population. It is clear that there is a significant room for improvement, and our information may also be used as a reference to analyze the situation in other cities of our country in similar scenarios. A critical review of the rheumatology skills in primary practitioners should be coordinated, and if needed, a corrective plan can be tailored with the combination of this information.

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