



# REVISTA BRASILEIRA DE REUMATOLOGIA

[www.reumatologia.com.br](http://www.reumatologia.com.br)



## Review article

# Prevalence of fibromyalgia: literature review update



*Amelia Pasqual Marques, Adriana de Sousa do Espírito Santo, Ana Assumpção Berssaneti, Luciana Akemi Matsutani, Susan Lee King Yuan\**

Universidade de São Paulo (USP), Faculdade de Medicina, Departamento de Fisioterapia, Fonoaudiologia e Terapia Ocupacional, São Paulo, SP, Brazil

### ARTICLE INFO

#### Article history:

Received 29 March 2016

Accepted 25 October 2016

Available online 8 February 2017

#### Keywords:

Fibromyalgia

Prevalence

Review

Rheumatic diseases

Chronic pain

### ABSTRACT

The present study aimed to update the literature review on the prevalence of fibromyalgia published in 2006. A bibliographical survey was carried out from 2005 to 2014 in the MEDLINE, Web of Science, Embase, LILACS and SciELO databases and 3274 records were identified. Five researchers selected the studies, following the inclusion criteria: studies that obtained the prevalence of fibromyalgia. Fibromyalgia studies in associated diseases were excluded. When screening by title and abstract, 2073 irrelevant articles were excluded. The full texts of 210 articles were evaluated for eligibility and this review included 39 studies, described in 41 articles. The selected studies were grouped into four categories: (A) prevalence of fibromyalgia in the general population; (B) prevalence of fibromyalgia in women; (C) prevalence of fibromyalgia in rural and urban areas; (D) prevalence of fibromyalgia in special populations. The literature shows values of fibromyalgia prevalence in the general population between 0.2 and 6.6%, in women between 2.4 and 6.8%, in urban areas between 0.7 and 11.4%, in rural areas between 0.1 and 5.2%, and in special populations values between 0.6 and 15%. This literature review update shows a significant increase in fibromyalgia prevalence studies in the world. The new 2010 American College of Rheumatology criteria have not been widely used yet and the COPCORD (Community-oriented program for control of Rheumatic Diseases) methodology has increased the quality of studies on the prevalence of rheumatic diseases in general.

© 2017 Elsevier Editora Ltda. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

\* Corresponding author.

E-mail: [susanlkyuan@yahoo.com.br](mailto:susanlkyuan@yahoo.com.br) (S.L. Yuan).

<http://dx.doi.org/10.1016/j.rbre.2017.01.005>

2255-5021/© 2017 Elsevier Editora Ltda. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## A prevalência de fibromialgia: atualização da revisão de literatura

### R E S U M O

#### Palavras-chave:

Fibromialgia

Prevalência

Revisão

Doenças reumáticas

Dor crônica

O presente estudo teve como objetivo atualizar a revisão de literatura sobre a prevalência da fibromialgia publicada em 2006. Foi realizado levantamento bibliográfico do período de 2005 a 2014 nas bases de dados MEDLINE, Web of Science, Embase, LILACS e SciELO, identificando-se 3274 registros. Cinco pesquisadores selecionaram os estudos, de acordo com os critérios de inclusão: estudos que obtiveram a prevalência da fibromialgia. Foram excluídos estudos da fibromialgia em doenças. Na triagem pelo título e resumo, foram excluídos 2073 artigos irrelevantes. Foram avaliados quanto à elegibilidade os textos completos de 210 artigos, incluindo-se nesta revisão 39 estudos, descritos em 41 artigos. Os estudos selecionados foram agrupados em quatro categorias: a) prevalência da fibromialgia na população em geral; b) prevalência da fibromialgia em mulheres; c) prevalência da fibromialgia em áreas rurais e urbanas; d) prevalência da fibromialgia em populações especiais. A literatura aponta valores de prevalência da fibromialgia na população em geral entre 0,2 e 6,6%, em mulheres valores entre 2,4 e 6,8%, nas áreas urbanas entre 0,7 e 11,4%, nas rurais entre 0,1 e 5,2%, e em populações especiais valores entre 0,6 e 15%. Esta atualização de revisão de literatura mostra um aumento expressivo de estudos de prevalência da fibromialgia ao redor do mundo. Os novos critérios do Colégio Americano de Reumatologia de 2010 foram ainda pouco utilizados e a metodologia COPCORD (Programa Orientado para a Comunidade para Controle de Doenças Reumáticas) aumentou a qualidade dos estudos de prevalência de doenças reumáticas em geral.

© 2017 Elsevier Editora Ltda. Este é um artigo Open Access sob uma licença CC BY-NC-ND (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

## Introduction

Fibromyalgia (FM) is a chronic pain syndrome with a complex, multifactorial and not completely known etiopathogenesis that affects mainly women, being characterized by generalized musculoskeletal pain and palpation-specific tender points, often associated with sleep disorders, fatigue, somatic and cognitive symptoms, as well as psychic disorders.<sup>1,2</sup>

We published our first literature review on FM prevalence in 2006, in the Brazilian Journal of Rheumatology.<sup>3</sup> During the period of 1990–2005, the FM prevalence found in the population ranged between 0.7 and 4.4%, being more prevalent in women than in men. It was possible to construct five categories according to study similarity patterns: prevalence of FM in adult populations; prevalence of FM in women; prevalence of FM in children and adolescents; prevalence of FM in specific populations and; prevalence of chronic and diffuse pain in the population, according to the American College of Rheumatology (ACR) criteria of 1990.<sup>4</sup> We observed that more prevalence studies were necessary.

After almost a decade, it is necessary to update the literature review on FM prevalence, aiming to know the new studies on this topic, especially after the publication in 2010 of the new ACR fibromyalgia diagnostic criteria.<sup>2</sup>

## Methods

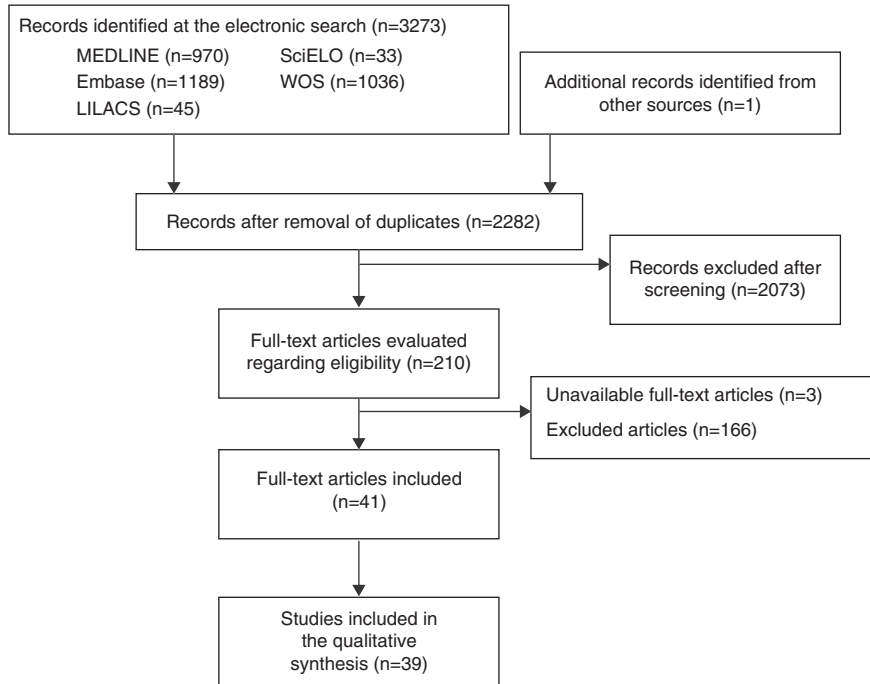
This literature review update was carried out with an electronic search in the MEDLINE, LILACS, Embase, Web of Science

and SciELO databases, from 2005 to 2014. The keywords used were “fibromyalgia” and “prevalence” and the corresponding words in Portuguese, “fibromialgia” and “prevalência”. A search was also carried out based on the list of publications available on the website of the Community-Oriented Program for Control of Rheumatic Diseases’ (COPCORD), an initiative of the International League of Rheumatology Associations.

A total of 3274 articles were found, and 992 were excluded, as they were duplicates. Five physical therapists with clinical and research experience in fibromyalgia selected the studies according to the inclusion criteria: cross-sectional studies that obtained the prevalence of fibromyalgia in the general population and in specific populations, for instance, women, children, adolescents and the elderly. The exclusion criterion was studies that obtained the prevalence of fibromyalgia associated with other diseases. When screening by title and abstract, 2073 articles were excluded from this review. The full texts of 210 articles were assessed for eligibility. At the end, 39 studies, described in 41 articles (Fig. 1), were included in this review.

Each researcher carried out the selection process of the studies individually and two meetings were held: one after the screening and another after applying the eligibility criteria to jointly define the articles to be included.

The following data were extracted from the included studies: Reference (title, authors and year); Population (country, city or region, age group, gender, FM diagnostic criteria, specialist who made the diagnosis, assessment of tender points, sample size, sample calculation and sampling process); Method (data collection and statistical analysis); Results



**Fig. 1 – Flowchart of the selection of fibromyalgia prevalence studies.**

(of overall FM prevalence, partial and stratified); Discussion (limitations); Contact (email).

## Results and discussion

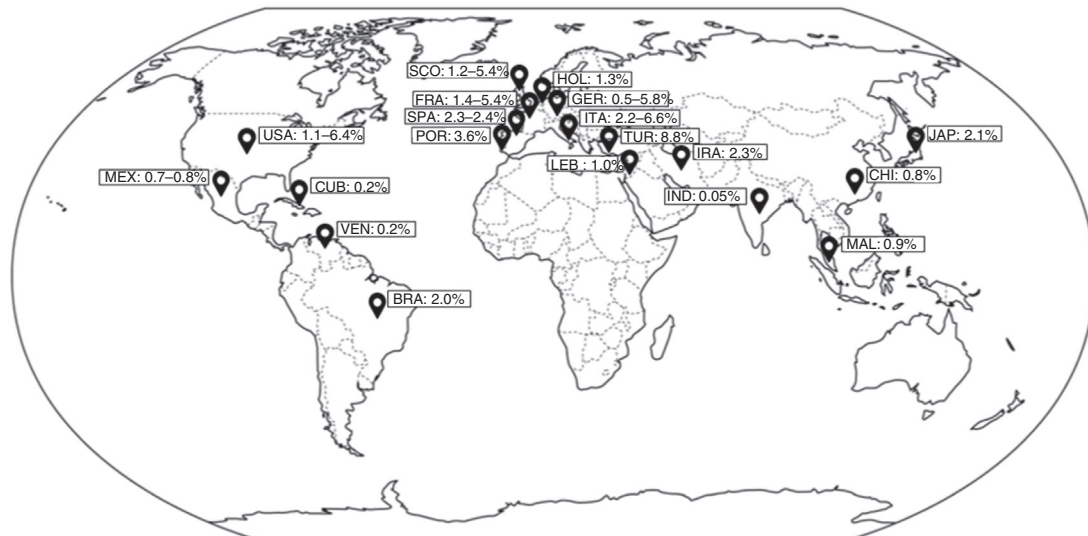
In this updated search, there was a significant increase in FM prevalence studies, as we obtained more than twice the number of studies included in the first review.<sup>3</sup> Only four recent studies used the new 2010 ACR diagnostic criteria and/or its modified version for epidemiological studies.<sup>5-8</sup> In twelve studies, the method used was based on the standardized

high-quality protocol and design recommended by COPCORD (Fig. 2).<sup>9-20</sup>

The selected articles were carefully grouped into four categories: (A) prevalence of FM in the general population; (B) prevalence of FM in women; (C) prevalence of FM in rural and urban areas; (D) prevalence of FM in special populations.

### Prevalence of fibromyalgia in the general population

In the category Prevalence of Fibromyalgia in the General Population, 19 articles were found. Of these, two reported on the prevalence in North America, one in Central America, two in



**Fig. 2 – Worldwide distribution of fibromyalgia prevalence (2005-2014).**

**Table 1 – Prevalence of fibromyalgia in the general population.**

Reference	Country	Sample	FM diagnostic criteria	Prevalence
Salaffi (2005) <sup>21</sup>	Italy	n = 3664 >18 years	ACR 1990	2.22%
Scudds (2006) <sup>22</sup>	China	n = 1467 18-65 years	ACR 1990	0.82%
Veerapen (2007) <sup>14</sup>	Malaysia	n = 2594 >15 years	Unspecified	Overall: 0.92% F: 0.8%/M: 0.08%
Loza (2008) <sup>23</sup>	Spain	n = 2192 >20 years	ACR 1990	2.4%
Reyes-Llerena (2009) <sup>13</sup>	Cuba	n = 3155	Unspecified	0.22%
Branco (2010) <sup>24,25</sup>	France, Italy, Germany, Spain and Portugal	n = 4517 >15 years	LFESSQ-4 and LFESSQ-6	LFESSQ-4: 4.7% LFESSQ-6: 2.9%
Creavin (2010) <sup>26</sup>	Netherlands	n = 2447 >18 years	Self-report	1.3%
Sauer (2010) <sup>27</sup>	Germany	n = 1.646.284	CID-10: M79.7 in databases	Overall: 0.45% F: 0.4%/M: 0.05%
Peláez-Ballestas (2011) <sup>12,28</sup>	Mexico	n = 19,213 >18 years	ACR 1990	Overall: 0.68% F: 1%/M: 0.34%
Perrot (2011) <sup>29</sup>	France	n = 3326 >18 years	LFESSQ and ACR 1990	1.6%
Chaaya (2012) <sup>9</sup>	Lebanon	n = 3530 15-90 years	ACR 1990	Overall: 1% F: 2%/M: 0%
Goren (2012) <sup>30</sup>	Brazil	n = 12,000 >18 years	Self-report	2%
Jones (2013) <sup>5</sup>	Scotland	n = 1604 >25 years	ACR 1990, ACR 2010 and modified ACR 2010	ACR1990: 1.7%/ACR2010: 1.2% ACR 2010 mod: 5.4%
Sandoughi (2013) <sup>11</sup>	Iran	n = 2700 >15 years	Unspecified	Overall: 2.31% F: 3.66%/M: 0.9%
Vincent (2013) <sup>7</sup>	USA	n = 2994 >21 years	Modified ACR 2010	6.4%
Wolfe (2013) <sup>8</sup>	Germany	n = 2515 ≥15 years	Modified ACR 2010	2.1%
Granados (2014) <sup>10</sup>	Venezuela	n = 3973 >18 years	ACR 1990	0.2%
Nakamura (2014) <sup>6</sup>	Japan	n = 20,407 >20 years	ACR 2010	2.1%

FM, fibromyalgia; ACR, American College of Rheumatology; LFESSQ, The London Fibromyalgia Epidemiology Study Screening Questionnaire; F, female; M, male.

South America, eight in Europe and five in Asia. The lowest overall prevalence was 0.2% in Venezuela,<sup>10</sup> and the highest was 6.4% in the United States.<sup>7</sup> The highest prevalence values were found in two articles that used the modified ACR criteria of 2010: 6.4% in a prevalence study in a specific region of the United States<sup>7</sup> and 5.4% in a study in Scotland.<sup>5</sup> Overall, excluding these studies, prevalence ranged from 0.2% to 4.7% (Table 1).

### Prevalence of fibromyalgia in women

FM is commonly more prevalent among women.<sup>31</sup> The prevalence of FM in studies carried out in the adult female population ranged between 2.4% and 6.8%. Four studies were found, half of them from Turkey<sup>32,33</sup> and the other half from Norway.<sup>34,35</sup> Both articles on the Turkish population studied samples of women from the same city of Trabzon. The two articles on the Norwegian population are based on data from a large healthcare study carried out in the Nord-Trøndelag district, with several characteristics of women residing in that district, in addition to FM. Possibly, for this reason, the prevalence values were close (2.4% and 2.6%).

The methodological difference of the studies was the criterion used to identify FM. In the Norwegian studies, women were asked whether they had ever been diagnosed with FM. In Turkey, women were evaluated by a researcher physician following the 1990 ACR criteria at the time of the research (Table 2).

### Prevalence of fibromyalgia in urban and rural areas

Since the acknowledgment of the fibromyalgia syndrome to the present day, one of the questions of the scientific community is the understanding of factors that are implicated in its onset.<sup>36</sup> Socio-economic-cultural factors are believed to have an influence on its prevalence.<sup>37</sup> In this respect, some authors have chosen a division regarding where people live: urban and rural areas.

Among the nine selected studies, six showed geographical proximity (Iran,<sup>15,18</sup> Turkey,<sup>38</sup> India,<sup>16</sup> Bangladesh<sup>17,39</sup>), and five of them used the COPCORD methodology.<sup>15-19</sup>

Overall, the prevalence found by the authors ranged between 0.69% and 11.4% in the urban area, and between 0.06% and 5.2% in the rural area (Table 3). However, there seems to

**Table 2 – Prevalence of fibromyalgia in women.**

Reference	Country	Sample	FM diagnostic criteria	Prevalence
Topbas (2005) <sup>32</sup>	Turkey	n = 1930 20–64 years	ACR 1990	3.6%
Cakirbay (2006) <sup>33</sup>	Turkey	n = 1045 18–55 years	ACR 1990	6.8%
Mork (2010) <sup>34</sup>	Norway	n = 15,990 >20 years	Self-report of medical diagnosis	2.4%
Mork e Nilsen (2012) <sup>35</sup>	Norway	n = 12,350 >20 years	Self-report of medical diagnosis	2.6%

FM, fibromyalgia; ACR, American College of Rheumatology.

be a tendency for the rural area to present a higher prevalence than the urban area, especially in studies that evaluated both regions.

### Prevalence of fibromyalgia in special populations

Table 4 shows the studies on fibromyalgia prevalence in special populations. Workers from seven different health institutions were invited to participate in the Toda study, but the sampling

process was not clearly described. Seven women and only one man met the FM classification criterion.<sup>42</sup>

Eiygor et al. invited all 322 medical students from the School of Medicine of Ege University to participate in the study, of which 11 refused to participate and 5 were excluded. Six subjects met the FM classification criteria, with a slightly higher prevalence in women than men.<sup>43</sup>

Assumpção et al. recruited by telephone subjects from a list of 2269 registered users of basic health units that had a contact

**Table 3 – Fibromyalgia prevalence studies in urban and rural areas.**

Reference	Country	Sample characteristics		FM diagnostic criteria	Prevalence
		Urban × rural			
Mas (2008) <sup>40</sup>	Spain	Both	n = 2192 >20 years	ACR 1990	Rural: 4.1% Urban: 1.7% Overall: 2.37%
Turhanoglu (2008) <sup>38</sup>	Turkey	Both	n = 600 >20 years F: 51%	ACR 1990	Rural: 5.2% Urban: 11.4% Overall: 8.8% F: 12.5%/M: 5.1%
Joshi e Chopra (2009) <sup>16</sup>	India	Both	n = 8145 >16 years F: 50.8%	ACR 1990	Rural: 3.77% Urban: 1.2% Overall: 0.05%
Rodriguez-Amado (2011) <sup>19</sup>	Mexico	Both	n ~ 5000 >18 years	ACR 1990	Rural: 1.3% Urban: 0.7% Overall: 0.8%
Haq (2005) <sup>17</sup>	Bangladesh	Both	n = 2601 rural + 1307 urban slum + 1252 emerging urban >15 years F: 98% rural, 85% urban slum and 82% emerging urban	ACR, year not described	Rural: 4.4% (F: 7.5%/M: 1.2%) Urban slum: 3.2% (F: 5.3%/M: 1.4%) Emerging urban: 3.3% (F: 5.8%/M: 3.3%) Rural: 1.3%
Alvarez-Nemegyei (2005) <sup>41</sup>	Mexico	Rural	n = 761 >18 years F: 49.8%	ACR 1990	Rural: 1.3%
Davatchi (2008) <sup>14</sup>	Iran	Urban	n = 10,291 >15 years F: 52.6%	Not described	Urban: 0.69%
Davatchi (2009) <sup>15</sup>	Iran	Rural	n = 1565 >15 years F: 55.1%	ACR 1990	Rural: 0.06%
Masudul-Hassan (2012) <sup>28</sup>	Bangladesh	Rural	n = 5217 F: 52%	ACR, year not described	Rural: 3.95%

FM, fibromyalgia; ACR, American College of Rheumatology; F, female; M, male.

**Table 4 – Prevalence of fibromyalgia in special populations.**

Reference	Country	Sample		FM diagnostic criteria	Prevalence
		Type	Characteristics		
Toda (2007) <sup>41</sup>	Japan	Healthcare workers	n = 539 F: 63.6%	ACR 1990	Overall: 1.48% F: 2.04%/M: 0.51%
Eyigor (2008) <sup>16</sup>	Turkey	Medical students	n = 306 F: 62.4%	ACR 1990	Overall: 2% F: 2.1%/M: 1.7%
Assumpção (2009) <sup>4</sup>	Brazil	Low socioeconomic level	n = 768 35–60 years F: 77%	ACR 1990	4.4%
Buskila (2009) <sup>7</sup>	Israel	Serious train crash survivors	n = 53 ≥18 years	ACR 1990	15%
Davatchi (2009) <sup>15</sup>	Iran	Caucasians and Turks	n = 7445 Caucasians + 2846 Turks ≥15 years	Not described	Caucasians: 0.6% Turks: 0.7%
Santos (2010) <sup>38</sup>	Brazil	Elderly	n = 361 ≥65 years F: 64%	ACR 1990	5.5%
Cobankara (2011) <sup>11</sup>	Turkey	Textile workers	n = 655 F: 81.2%	ACR 1990	Overall: 7.3% F: 9%/M: 0.8%
Kim (2012) <sup>24</sup>	South Korea	Primary care center users	n = 1077 18–80 years F: 52.1%	Clinical diagnosis or ACR 1990	ACR1990:1.7% (F: 2.9%/M: 0%). Clinical: 2.3% (F: 3.9%/M: 0.6%).

FM, fibromyalgia; ACR, American College of Rheumatology; F, female; M, male.

telephone number in the city of Embu das Artes, state of Sao Paulo, Brazil. Of the non-probabilistic sample of 768 contacted individuals, only 304 agreed to the clinical examination. Based on a Bayesian analysis, a 4.4% FM prevalence was estimated using the larger sample.<sup>44</sup>

In 2008, Buskila et al. sent mail invitations to 153 survivors of the 2005 train disaster in Israel, of which 115 responded and only 53 agreed to participate in the study. Eight women met the FM classification criteria.<sup>45</sup>

Davatchi et al. carried out the study in 22 districts of Tehran, following the COPCORD project methods. Of 10,291 people interviewed, 71.4% were Caucasians and 23.1% were Turks. There was no statistically significant difference between the ethnic groups regarding the prevalence of FM.<sup>20</sup>

Based on a sample calculation, Santos et al. invited 400 individuals (9 refused to participate and 30 were excluded) from a sample of 2072 subjects from the cross-sectional study “Sao Paulo Aging & Health Study”, carried out with all elderly residents of 66 census sectors with the lowest Human Development Indexes of the district of Butantã. Twenty women met the classification criteria in the FM prevalence study.<sup>46</sup>

In a population of 16,383 textile workers in the industrial region of the city of Denizli, Cobankara et al. needed to recruit 585 subjects, according to the sample calculation. Of ten textile mills, they randomly selected four with 655 workers, of which none refused to participate in the study. Forty-eight subjects with FM were diagnosed, with the prevalence being higher in women than in men.<sup>47</sup>

Kim et al. recruited all 1158 individuals who visited the Family Medicine Center at Kangbuk Samsung Hospital from April to May 2010. Thirty-five subjects refused to participate, while 46 were excluded, as they responded inadequately to the evaluation questionnaires. The 1990 ACR classification criteria

were met by 18 women, while a greater number of 25 subjects (22 women and 3 men) were obtained based on the clinical diagnosis.<sup>48</sup>

The results of studies in which the sampling procedure or the criteria used for FM diagnosis were not adequate should be analyzed with caution. The rate of respondents and non-respondents should be described and be within acceptable values to confirm the validity of the prevalence data.<sup>49</sup>

### Practical implications

This review can contribute to the implementation of diagnostic guidelines and recommendations for the treatment of fibromyalgia, updating health professionals, as well as stimulating future prevalence studies.

### Study limitations

The limitations found were: inclusion of articles written in Portuguese and English only and, despite attempts to contact the authors, three of the selected articles could not be included because the full text could not be found.

### Conclusion

The literature indicates FM prevalence values in the general population between 0.2 and 6.6%; in women, values between 2.4 and 6.8%; in urban areas between 0.7 and 11.4% and in rural areas between 0.1 and 5.2%. This literature review update shows a significant increase in FM prevalence studies worldwide. The new 2010 ACR criteria were still little used and the

COPCORD methodology increased the quality of studies on the prevalence of rheumatic diseases in general.

### Conflicts of interest

The authors declare no conflicts of interest.

### REFERENCES

- Martinez JE, editor. *Fibromialgia – uma introdução*. São Paulo: EDUC; 1998.
- Wolfe F, Clauw DJ, Fitzcharles MA, Goldenberg DL, Katz RS, Mease P, et al. The American College of Rheumatology preliminary diagnostic criteria for fibromyalgia and measurement of symptom severity. *Arthritis Care Res*. 2010;62:600–10.
- Cavalcante AB, Sauer JF, Chalot SD, Assumpcao A, Lage LV, Matsutani LA, et al. The prevalence of fibromyalgia: a literature review. *Rev Bras Reumatol*. 2006;46:40–8.
- Wolfe F, Smythe HA, Yunus MB, Bennett RM, Bombardier C, Goldenberg DL, et al. The American College of Rheumatology 1990 criteria for the classification of fibromyalgia. Report of the multicenter criteria committee. *Arthritis Rheum*. 1990;33:160–72.
- Jones GT, Beasley M, Atzeni F, Fluss E, Sarzi-Puttini P, Macfarlane G. The prevalence of fibromyalgia in the general population – a comparison of the ACR 1990, 2010 and modified 2010 classification criteria. *Arthritis Rheum*. 2013;65: S358–S.
- Nakamura I, Nishioka K, Usui C, Osada K, Ichibayashi H, Ishida M, et al. An epidemiologic internet survey of fibromyalgia and chronic pain in Japan. *Arthritis Care Res*. 2014;66:1093–101.
- Vincent A, Lahr BD, Wolfe F, Clauw DJ, Whipple MO, Oh TH, et al. Prevalence of fibromyalgia: a population-based study in Olmsted County, Minnesota, utilizing the Rochester Epidemiology Project. *Arthritis Care Res (Hoboken)*. 2013;65:786–92.
- Wolfe F, Brahler E, Hinz A, Hauser W. Fibromyalgia prevalence, somatic symptom reporting, and the dimensionality of polysymptomatic distress: results from a survey of the general population. *Arthritis Care Res (Hoboken)*. 2013;65:777–85.
- Chaaya M, Slim ZN, Habib RR, Arayssi T, Dana R, Hamdan O, et al. High burden of rheumatic diseases in Lebanon: a COPCORD study. *Int J Rheum Dis*. 2012;15:136–43.
- Granados Y, Cedeno L, Rosillo C, Berbin S, Azocar M, Molina ME, et al. Prevalence of musculoskeletal disorders and rheumatic diseases in an urban community in Monagas State, Venezuela: a COPCORD study. *Clin Rheumatol*. 2015;34:871–7.
- Sandoughi M, Zakeri Z, Tehrani Banihashemi A, Davatchi F, Narouie B, Shikhzadeh A, et al. Prevalence of musculoskeletal disorders in southeastern Iran: a WHO-ILAR COPCORD study (stage 1, urban study). *Int J Rheum Dis*. 2013;16:509–17.
- Pelaez-Ballestas I, Sanin LH, Moreno-Montoya J, Alvarez-Nemegyei J, Burgos-Vargas R, Garza-Elizondo M, et al. Epidemiology of the rheumatic diseases in Mexico. A study of 5 regions based on the COPCORD methodology. *J Rheumatol Suppl*. 2011;86:3–8.
- Reyes-Llerena GA, Guibert-Toledano M, Penedo-Coello A, Perez-Rodriguez A, Baez-Duenas RM, Charnicharo-Vidal R, et al. Community-based study to estimate prevalence and burden of illness of rheumatic diseases in Cuba: a COPCORD study. *J Clin Rheumatol*. 2009;15:51–5.
- Veerapen K, Wigley RD, Valkenburg H. Musculoskeletal pain in Malaysia: a COPCORD survey. *J Rheumatol*. 2007;34:207–13.
- Davatchi F, Banihashemi AT, Gholami J, Faezi ST, Forouzanfar MH, Salesi M, et al. The prevalence of musculoskeletal complaints in a rural area in Iran: a WHO-ILAR COPCORD study (stage 1, rural study) in Iran. *Clin Rheumatol*. 2009;28:1267–74.
- Joshi VL, Chopra A. Is there an urban-rural divide? Population surveys of rheumatic musculoskeletal disorders in the Pune region of India using the COPCORD Bhigwan model. *J Rheumatol*. 2009;36:614–22.
- Haq SA, Darmawan J, Islam MN, Uddin MZ, Das BB, Rahman F, et al. Prevalence of rheumatic diseases and associated outcomes in rural and urban communities in Bangladesh: a COPCORD study. *J Rheumatol*. 2005;32:348–53.
- Davatchi F, Jamshidi AR, Banihashemi AT, Gholami J, Forouzanfar MH, Akhlaghi M, et al. WHO-ILAR COPCORD study (stage 1, urban study) in Iran. *J Rheumatol*. 2008;35:1384.
- Rodriguez-Amado J, Pelaez-Ballestas I, Sanin LH, Esquivel-Valerio JA, Burgos-Vargas R, Perez-Barbosa L, et al. Epidemiology of rheumatic diseases. A community-based study in urban and rural populations in the state of Nuevo Leon, Mexico. *J Rheumatol Suppl*. 2011;86:9–14.
- Davatchi F, Jamshidi AR, Tehrani Banihashemi A, Gholami J, Hossein Forouzanfar M, Akhlaghi M, et al. Effect of ethnic origin (Caucasians versus Turks) on the prevalence of rheumatic diseases: a WHO-ILAR COPCORD urban study in Iran. *Clin Rheumatol*. 2009;28:1275–82.
- Salaffi F, De Angelis R, Grassi W. Prevalence of musculoskeletal conditions in an Italian population sample: results of a regional community-based study. I. The MAPPING study. *Clin Exp Rheumatol*. 2005;23:819–28.
- Scudds RA, Li EKM, Scudds RJ. The prevalence of fibromyalgia syndrome in Chinese people in Hong Kong. *J Musculoskelet Pain*. 2006;14:3–11.
- Loza E, Abasolo L, Jover JA, Carmona L, Aretxabala I, Ballina J, et al. Burden of disease across chronic diseases: a health survey that measured prevalence, function, and quality of life. *J Rheumatol*. 2008;35:159–65.
- Branco JC, Bannwarth B, Failde I, Abello Carbonell J, Blotman F, Spaeth M, et al. Prevalence of fibromyalgia: a survey in five European countries. *Semin Arthritis Rheum*. 2010;39:448–53.
- Bannwarth B, Blotman F, Roue-Le Lay K, Caubere JP, Andre E, Taieb C. Fibromyalgia syndrome in the general population of France: a prevalence study. *Joint Bone Spine*. 2009;76:184–7.
- Creavin ST, Dunn KM, Mallen CD, Nijrolder I, van der Windt DA. Co-occurrence and associations of pain and fatigue in a community sample of Dutch adults. *Eur J Pain*. 2010;14:327–34.
- Sauer K, Kemper C, Glaeske G. Fibromyalgia syndrome: prevalence, pharmacological and non-pharmacological interventions in outpatient health care. An analysis of statutory health insurance data. *Joint Bone Spine*. 2011;78:80–4.
- Alvarez-Nemegyei J, Pelaez-Ballestas I, Sanin LH, Cardiel MH, Ramirez-Angulo A, Goycochea-Robles MV. Prevalence of musculoskeletal pain and rheumatic diseases in the southeastern region of Mexico. A COPCORD-based community survey. *J Rheumatol Suppl*. 2011;86:21–5.
- Perrot S, Vicaut E, Servant D, Ravaud P. Prevalence of fibromyalgia in France: a multi-step study research combining national screening and clinical confirmation: the DEFI study (Determination of Epidemiology of Fibromyalgia). *BMC Musculoskelet Disord*. 2011;12:224.
- Goren A, Gross HJ, Fujii RK, Pandey A, Mould-Quevedo J. Prevalência da percepção e do tratamento da dor e de seus resultados de saúde em diferentes condições do Brasil. Prevalence of pain awareness, treatment, and associated health outcomes across different conditions in Brazilien. *Rev dor*. 2012;13:308–19.

31. Imboden J, Hellmann D, Stone J. *Current reumatologia: diagnóstico e tratamento*. 2 ed. São Paulo: McGraw-Hill; 2008.
32. Topbas M, Cakirbay H, Gulec H, Akgol E, Ak I, Can G. The prevalence of fibromyalgia in women aged 20-64 in Turkey. *Scand J Rheumatol*. 2005;34:140-4.
33. Cakirbayl H, Cebi A, Cebi E, Karkucak M, Capkin E. Risk factors of fibromyalgia in Turkish women. *Pain Clin*. 2006;18:251-7.
34. Mork PJ, Vasseljen O, Nilsen TI. Association between physical exercise, body mass index, and risk of fibromyalgia: longitudinal data from the Norwegian Nord-Trondelag Health Study. *Arthritis Care Res (Hoboken)*. 2010;62:611-7.
35. Mork PJ, Nilsen TI. Sleep problems and risk of fibromyalgia: longitudinal data on an adult female population in Norway. *Arthritis Rheum*. 2012;64:281-4.
36. Fitzcharles MA, Rampakakis E, Ste-Marie PA, Sampalis JS, Shir Y. The association of socioeconomic status and symptom severity in persons with fibromyalgia. *J Rheumatol*. 2014;41:1398-404.
37. Macfarlane GJ, Norrie G, Atherton K, Power C, Jones GT. The influence of socioeconomic status on the reporting of regional and widespread musculoskeletal pain: results from the 1958 British Birth Cohort Study. *Ann Rheum Dis*. 2009;68:1591-5.
38. Turhanoglu AD, Yilmaz S, Kaya S, Dursun M, Kararmaz A, Saka G. The epidemiological aspects of fibromyalgia syndrome in adults living in turkey: a population based study. *J Musculoskelet Pain*. 2008;16:141-7.
39. Masudul Hassan M, Haq SA, Choudhury MR, Islam MN, Das A, Banik G, et al. Patterns of nonarticular rheumatism in a rural area of Bangladesh. *J Med (Bangladesh)*. 2012;13:165-9.
40. Mas AJ, Carmona L, Valverde M, Ribas B. Prevalence and impact of fibromyalgia on function and quality of life in individuals from the general population: results from a nationwide study in Spain. *Clin Exp Rheumatol*. 2008;26:519-26.
41. Alvarez Nemegeyi J, Nuno Gutierrez BL, Alcocer Sanchez JA. Rheumatic diseases and labor disability in adult rural population. *Rev Med Inst Mex Seguro Soc*. 2005;43:287-92.
42. Toda K. The prevalence of fibromyalgia in Japanese workers. *Scand J Rheumatol*. 2007;36:140-4.
43. Eyigor S, Ozdedeli S, Durmaz B. The prevalence of generalized soft tissue rheumatic conditions in Turkish medical students. *J Clin Rheumatol*. 2008;14:65-8.
44. Assumpcao A, Cavalcante AB, Capela CE, Sauer JF, Chalot SD, Pereira CA, et al. Prevalence of fibromyalgia in a low socioeconomic status population. *BMC Musculoskelet Disord*. 2009;10:64.
45. Buskila D, Ablin JN, Ben-Zion I, Muntanu D, Shalev A, Sarzi-Puttini P, et al. A painful train of events: increased prevalence of fibromyalgia in survivors of a major train crash. *Clin Exp Rheumatol*. 2009;27 Suppl. 56:S79-85.
46. Santos AMB, Burti JS, Lopes JB, Scazufca M, Marques AP, Pereira RMR. Prevalence of fibromyalgia and chronic widespread pain in community-dwelling elderly subjects living in Sao Paulo, Brazil. *Maturitas*. 2010;67:251-5.
47. Cobankara V, Unal UO, Kaya A, Bozkurt AI, Ozturk MA. The prevalence of fibromyalgia among textile workers in the city of Denizli in Turkey. *Int J Rheum Dis*. 2011;14:390-4.
48. Kim C, Kim H, Kim J. Prevalence of chronic widespread pain and fibromyalgia syndrome: a Korean hospital-based study. *Rheumatol Int*. 2012;32:3435-42.
49. Loney PL, Chambers LW, Bennett KJ, Roberts JG, Stratford PW. Critical appraisal of the health research literature: prevalence or incidence of a health problem. *Chronic Dis Can*. 1998;19:170-6.