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Review article

Prevalence of fibromyalgia: literature review update

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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.

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A prevalência de fibromialgia: atualização da revisão de literatura

Palavras-chave:
Fibromialgia
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Revisão
Doenças reumáticas
Dor crônica

RESUMO

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.

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.[1,2]

We published our first literature review on FM prevalence in 2006, in the Brazilian Journal of Rheumatology.[3] 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.[4] 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.[2]

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

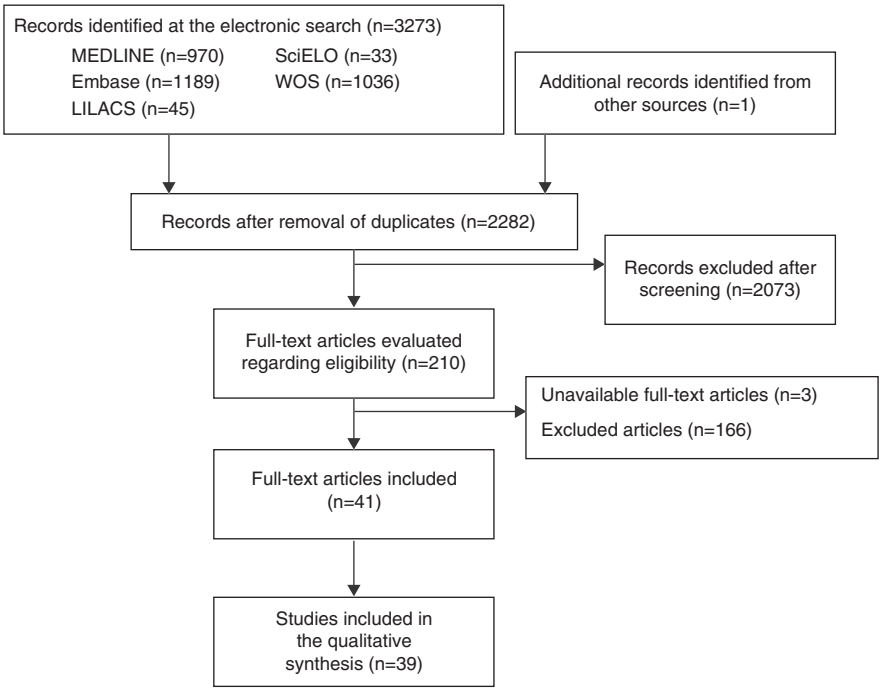

Fig. 1 – Flowchart of the selection of fibromyalgia prevalence studies.

(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.[3] Only four recent studies used the new 2010 ACR diagnostic criteria and/or its modified version for epidemiological studies.[5–8] In twelve studies, the method used was based on the standardized high-quality protocol and design recommended by COPCORD (Fig. 2).[9–20]

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

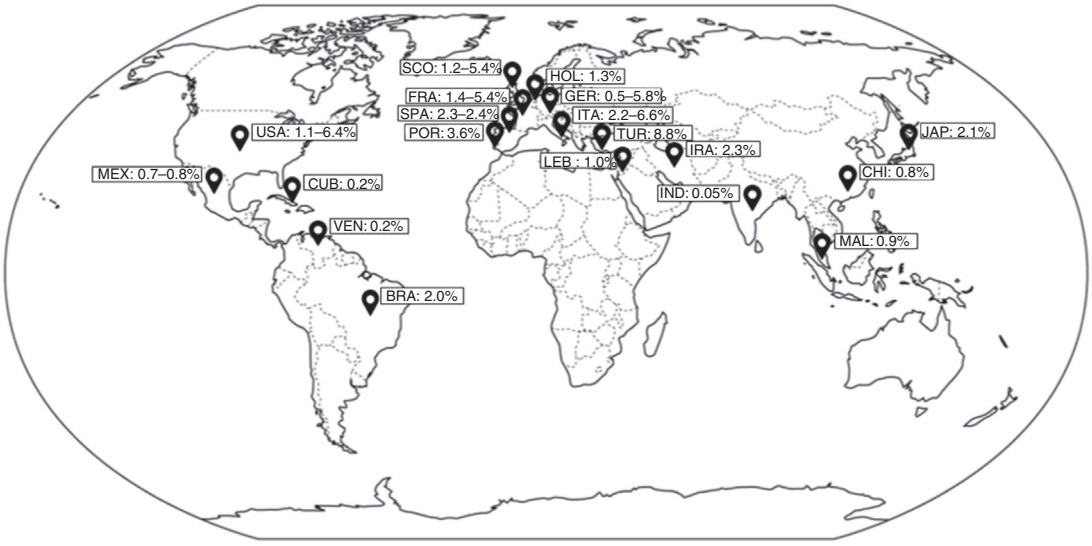

Fig. 2 – Worldwide distribution of fibromyalgia prevalence (2005–2014).

Table 1 – Prevalence of fibromyalgia in the general population.

Reference	Country	Sample	FM diagnostic criteria	Prevalence
Salaffi (2005)[21]	Italy	n = 3664 >18 years	ACR 1990	2.22%
Scudds (2006)[22]	China	n = 1467 18–65 years	ACR 1990	0.82%
Veerapen (2007)[14]	Malaysia	n = 2594 >15 years	Unspecified	Overall: 0.92% F: 0.8%/M: 0.08%
Loza (2008)[23]	Spain	n = 2192 >20 years	ACR 1990	2.4%
Reyes-Llerena (2009)[13]	Cuba	n = 3155	Unspecified	0.22%
Branco (2010)[24,25]	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)[26]	Netherlands	n = 2447 >18 years	Self-report	1.3%
Sauer (2010)[27]	Germany	n = 1.646.284	CID-10: M79.7 in databases	Overall: 0.45% F: 0.4%/M: 0.05%
Peláez-Ballestas (2011)[12,28]	Mexico	n = 19,213 >18 years	ACR 1990	Overall: 0.68% F: 1%/M: 0.34%
Perrot (2011)[29]	France	n = 3326 >18 years	LFESSQ and ACR 1990	1.6%
Chaaya (2012)[9]	Lebanon	n = 3530 15–90 years	ACR 1990	Overall: 1% F: 2%/M: 0%
Goren (2012)[30]	Brazil	n = 12,000 >18 years	Self-report	2%
Jones (2013)[5]	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)[11]	Iran	n = 2700 >15 years	Unspecified	Overall: 2.31% F: 3.66%/M: 0.9%
Vincent (2013)[7]	USA	n = 2994 >21 years	Modified ACR 2010	6.4%
Wolfe (2013)[8]	Germany	n = 2515 ≥15 years	Modified ACR 2010	2.1%
Granados (2014)[10]	Venezuela	n = 3973 >18 years	ACR 1990	0.2%
Nakamura (2014)[6]	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,[10] and the highest was 6.4% in the United States.[7] 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[7] and 5.4% in a study in Scotland.[5] 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.[31] 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[32,33] and the other half from Norway.[34,35] 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.[36] Socio-economic-cultural factors are believed to have an influence on its prevalence.[37] 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,[15,18] Turkey,[38] India,[16] Bangladesh[17,39]), and five of them used the COPCORD methodology.[15–19]

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)[32]	Turkey	*n* = 1930 20–64 years	ACR 1990	3.6%
Cakirbay (2006)[33]	Turkey	*n* = 1045 18–55 years	ACR 1990	6.8%
Mork (2010)[34]	Norway	*n* = 15,990 >20 years	Self-report of medical diagnosis	2.4%
Mork e Nilsen (2012)[35]	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.[42]

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.[43]

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)[40]	Spain	Both	*n* = 2192 >20 years	ACR 1990	Rural: 4.1% Urban: 1.7% Overall: 2.37%
Turhanoglu (2008)[38]	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)[16]	India	Both	*n* = 8145 >16 years F: 50.8%	ACR 1990	Rural: 3.77% Urban: 1.2% Overall: 0.05%
Rodriguez-Amado (2011)[19]	Mexico	Both	*n* ~ 5000 >18 years	ACR 1990	Rural: 1.3% Urban: 0.7% Overall: 0.8%
Haq (2005)[17]	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%)
Alvarez-Nemegyei (2005)[41]	Mexico	Rural	*n* = 761 >18 years F: 49.8%	ACR 1990	Rural: 1.3%
Davatchi (2008)[14]	Iran	Urban	*n* = 10,291 >15 years F: 52.6%	Not described	Urban: 0.69%
Davatchi (2009)[15]	Iran	Rural	*n* = 1565 >15 years F: 55.1%	ACR 1990	Rural: 0.06%
Masudul-Hassan (2012)[28]	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)[41]	Japan	Healthcare workers	*n* = 539 F: 63.6%	ACR 1990	Overall: 1.48% F: 2.04%/M: 0.51%
Eyigor (2008)[16]	Turkey	Medical students	*n* = 306 F: 62.4%	ACR 1990	Overall: 2% F: 2.1%/M: 1.7%
Assumpção (2009)[4]	Brazil	Low socioeconomic level	*n* = 768 35–60 years F: 77%	ACR 1990	4.4%
Buskila (2009)[7]	Israel	Serious train crash survivors	*n* = 53 ≥18 years	ACR 1990	15%
Davatchi (2009)[15]	Iran	Caucasians and Turks	*n* = 7445 Caucasians + 2846 Turks ≥15 years	Not described	Caucasians: 0.6% Turks: 0.7%
Santos (2010)[38]	Brazil	Elderly	*n* = 361 ≥65 years F: 64%	ACR 1990	5.5%
Cobankara (2011)[11]	Turkey	Textile workers	*n* = 655 F: 81.2%	ACR 1990	Overall: 7.3% F: 9%/M: 0.8%
Kim (2012)[24]	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.[44]

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.[45]

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.[20]

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.[46]

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.[47]

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.[48]

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.[49]

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.

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