

# Fibromyalgia Definition and Epidemiology

## Key Chapter Points

- Fibromyalgia is a chronic, painful condition characterized by widespread pain and positive tender points on physical examination.
- Fibromyalgia affects about 2–3% of adults worldwide, although prevalence is lower in Asia.
- Women are more likely to have fibromyalgia than men.
- Fibromyalgia is co-morbid with other rheumatologic conditions, headaches, chronic fatigue syndrome, irritable bowel syndrome, depression, and anxiety.
- Patients with fibromyalgia experience substantial disability, healthcare utilization, and disease-related costs.

**Keywords** Co-morbidity · Cost · Disability · Gender · Prevalence

Fibromyalgia is recognized as a condition resulting in both chronic, widespread pain and a variety of somatic complaints. The symptoms reported by fibromyalgia patients often contrast sharply with their characteristically unremarkable musculoskeletal and neurological examinations, with normal laboratory and radiographic tests. Despite normal physical examinations and testing, however, fibromyalgia patients are typically afflicted with substantial disability and emotional distress.

**Case:** Lynn S. was diagnosed with fibromyalgia at age 32. Symptoms began shortly after the delivery of her son that was complicated by prolonged labor and a post-delivery incision infection. “After my son was born, I noticed that it was harder and harder for me to do things I would normally do. I was in pain all the time, fatigued, yet suffering insomnia symptoms. I went through a year and a half of not knowing what was wrong, thinking I was crazy and must be imagining this stuff. I had a bone scan, carpal tunnel test for numbness in my wrists, and a host of other tests that turned up nothing. My doctors kept telling me my symptoms were caused by my busy schedule as a young mother,

working full time, and being very active with community groups. I found this offensive – I was young and I didn't think what I was doing was so over the top. . .it was normal. The doctors seemed to be suggesting that I was the cause for my symptoms, and I knew the way I was feeling wasn't my fault. Finally, a resident at my family doctor's office suggested I see a rheumatologist where I was diagnosed with fibromyalgia. I had no idea at the time what fibromyalgia was, but I would certainly find out in the ensuing months and years!"

## Defining Fibromyalgia

Fibromyalgia is a diffuse, chronic pain associated with tender body areas and somatic complaints. Fibromyalgia pain is widespread, although the areas affected by pain often fluctuate, with different areas perceived as more or less problematic on different days. By definition, patients with exclusively localized or focal pain complaints will not be diagnosed with fibromyalgia. A diagnosis of fibromyalgia requires a patient's description of widespread pain, along with the presence of at least 11 of 18 possible tender points (Box 1). Tender points are 18 predetermined areas that tend to be painful with pressure in patients with fibromyalgia. A complete description of tender points is provided in the chapter "Assessment and Diagnosis."

### Practical pointer

Fibromyalgia is a widespread, chronic pain condition with at least 11 positive tender points on physical examination.

### Box 1 Diagnosis of Fibromyalgia (Based on American College of Rheumatology Criteria; Wolfe [1])

- Widespread body pain
  - Pain on both left and right sides of the body
  - Pain above and below the waist
  - Axial pain present
- Pain persisting  $\geq 3$  months
- $\geq 11$  of 18 tender points painful to 4 kg pressure

Most patients with fibromyalgia experience a wide variety of fluctuating symptoms in addition to body pain [1]. The diversity of fibromyalgia symptoms was highlighted in the results of a survey of 2,569 fibromyalgia sufferers visiting the National Fibromyalgia Association Web site [2]. Most of the respondents were female (97%) with a mean age of 47 years. The most commonly reported symptoms included pain, sensory/neurological disturbances, psychological distress, and gastrointestinal symptoms (Table 1).

**Practical pointer**

Fibromyalgia patients characteristically report a wide variety of non-pain symptoms, including neurological disturbances, gastrointestinal, chronic fatigue, and psychological distress.

**Table 1** Top 12 symptoms reported by people with fibromyalgia (Bennett [2])

Currently active symptoms	Percentage people with fibromyalgia reporting
Low-back pain	63
Recurrent headaches	47
Arthritis	46
Muscle spasm	46
Tingling	46
Balance disturbance	45
Irritable bowel syndrome	44
Numbness	44
Chronic fatigue	40
Bloating	40
Depression	40
Anxiety	38

A survey of 196 fibromyalgia patients showed that most fibromyalgia patients need more information to better understand fibromyalgia [3]. Fibromyalgia patients’ attitudes about their condition, however, makes them excellent candidates for medical treatment, as most fibromyalgia patients are open to treatment, eager to comply with prescribed therapies, and hopeful for treatment benefit. Most patients with fibromyalgia believe:

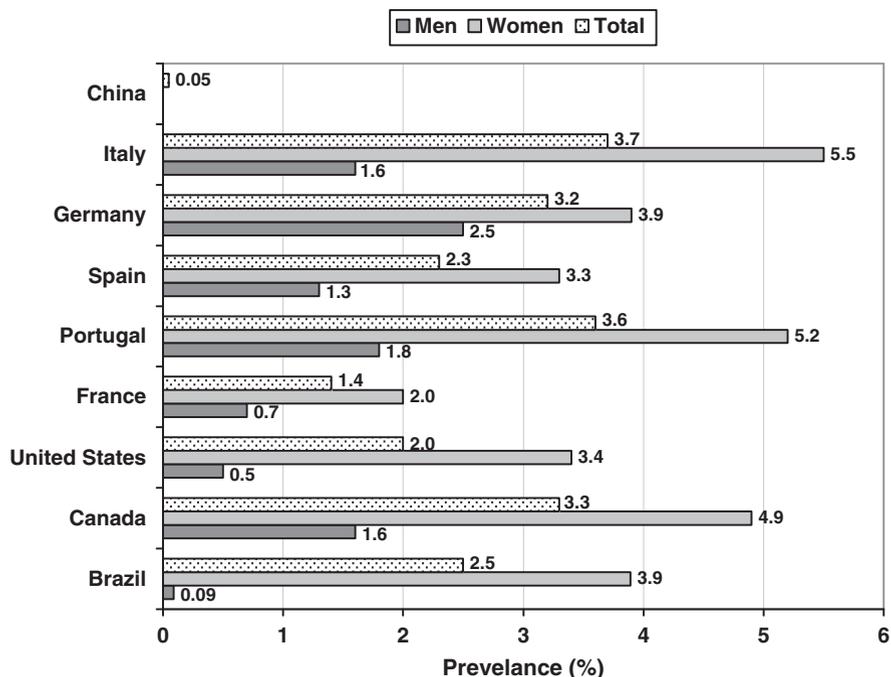
- Fibromyalgia symptoms will likely be chronic
- Fibromyalgia symptoms are expected to fluctuate over time
- Fibromyalgia will have severe impact on physical, social, and psychological functioning

- There is a lot fibromyalgia patients can do personally to help control their symptoms
- Medical treatments are likely to be effective in decreasing their symptoms

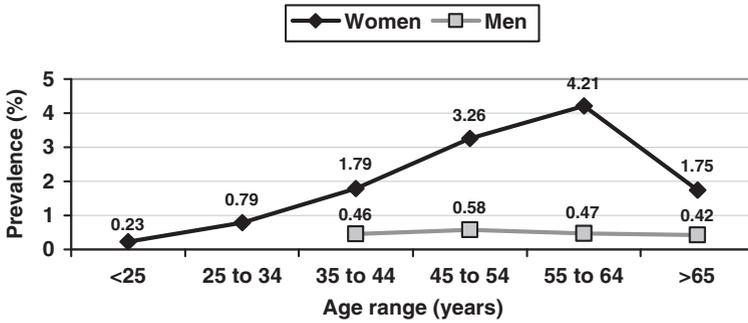
Furthermore, patients did not endorse many negative emotions, such as anger, related to their fibromyalgia diagnosis. Healthcare providers, therefore, should be encouraged that, despite the wide assortment of complaints verbalized by fibromyalgia patients, these patients are generally engaged and expectant of good outcome with treatment.

### Epidemiology of Fibromyalgia

Fibromyalgia affects about 2–3% of adults in the Americas and Europe [4–8]. Similar to other rheumatologic conditions, the prevalence is substantially lower in China at about 0.05% [9] (Fig. 1). Women are more likely to be affected with fibromyalgia. Interestingly, the prevalence of fibromyalgia remains relatively



**Fig. 1** Prevalence of fibromyalgia (based on Senna [4], McNally [7], Lawrence [6], Zeng [9], Branco [8]). Due to the low total prevalence in China (0.05%), gender differences were not available



**Fig. 2** Prevalence of fibromyalgia with age (based on McNally [7]). Sufficient data were not available to calculate prevalence in men before age 35

stable in men across their lifetimes, while the prevalence increases in women, peaking between ages 55–64 years old, and then declining in women  $\geq 65$  years old (Fig. 2) [7].

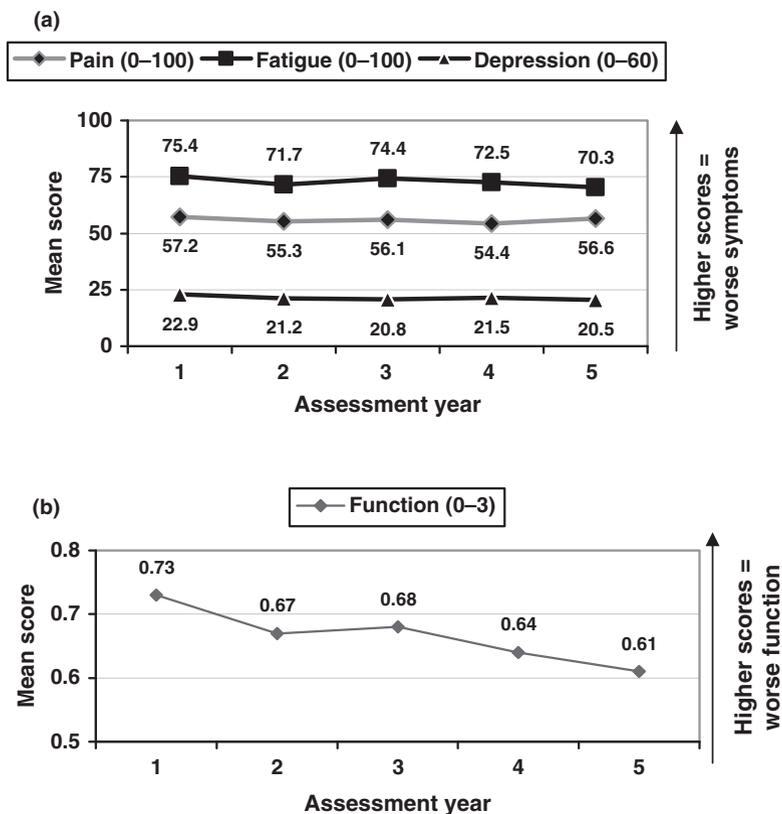
**Practical pointer**

Fibromyalgia affects about 2–3% of adults, with women affected about three times more often than men. Peak prevalence is between 55 and 64 years old.

Long-term prognosis of fibromyalgia was evaluated in a 5-year study in which female patients with fibromyalgia and no other chronic health conditions were interviewed annually [10]. Retention in the study was good with 287 women initially evaluated (average age = 47 years, average disease duration = 5 years). A total of 241 women completed at least two interviews and 211 completed all 5 years of assessment. Significant improvements were noted over time in fatigue, function, and depression score, although pain did not change significantly (Fig. 3).

**Co-morbid Conditions**

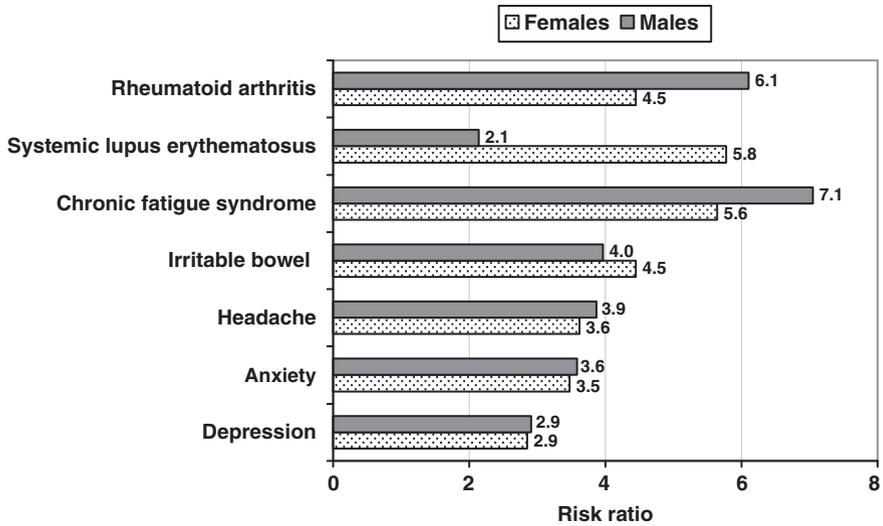
A diversity of other rheumatologic, medical, and psychological conditions is co-morbid with fibromyalgia. Using a large insurance claims database in the United States, the prevalence of concomitant illnesses was compared between patients with and without fibromyalgia [11]. Risk ratios  $>1$  were used to identify co-morbid illness occurring with greater than expected prevalence among fibromyalgia patients (Fig. 4). Medical and psychological conditions were co-morbid in both genders with fibromyalgia. A detailed description of the most commonly occurring co-morbid conditions is provided in the chapters “Headache,” “Chronic Fatigue Syndrome,”



**Fig. 3** Long-term outcome in fibromyalgia patients (based on Reisine [10]). (a) Pain, fatigue, and depression, (b) function

“Irritable Bowel Syndrome,” “Sleep Disturbance,” “Depression and Anxiety,” and “Obesity and Metabolic Syndrome.”

Autonomic dysfunction is also common among fibromyalgia patients. A syndrome that shares many features with fibromyalgia and may occur co-morbidly is postural orthostatic tachycardia syndrome (POTS). Normally, mild, asymptomatic cardiovascular changes occur when assuming an upright posture, with an immediate loss of about 500 mL of blood from the thorax to the abdomen and lower extremities and a 10–25% shift of plasma volume from vasculature to interstitial tissues. Venous return to the heart decreases and compensatory sympathetic activation occurs, causing a transient increase in heart rate during the first minute of about 10–20 beats per minute and systemic vasoconstriction with an approximate 5 mm Hg increase in diastolic blood pressure. POTS syndrome is defined as orthostatic tachycardia greater than expected from normal physiological changes that occurs without hypotension (Box 2). POTS exhibits circadian variability with the most extreme drop in heart rate occurring in the morning, so diagnostic testing should ideally be performed in the morning. Dark red mottling of the legs may



**Fig. 4** Co-morbid conditions and fibromyalgia (based on Weir [11]). All of the conditions in the graph were co-morbid with fibromyalgia, except for systemic lupus erythematosus in men, which failed to achieve statistical significance due to wide data variability (95% confidence interval = 0.29–15.74)

be noted after standing for about 5 min. A variety of symptoms are commonly reported in patients with POTS (Box 3). The Mayo Clinic published data on a relatively large sample of POTS patients ( $N = 152$ ), with the most commonly reported symptoms being light headedness or dizziness (78%), palpitations (75%), presyncope (61%), exercise intolerance (53%), heat intolerance (53%), weakness (50%), and fatigue (48%) [12]. POTS typically occurs between 12 and 51 years old, with women affected four to five times more often than men. POTS syndrome has been reported to occur in many patients with fibromyalgia, although good epidemiological data are lacking [13]. In an observational cohort study, POTS was identified in 9% of a control population vs. 27% with chronic fatigue syndrome [14]. Treatment is generally conservative and aerobic exercise should be encouraged as deconditioning at least worsens POTS and, in some cases, may have a causative influence (Box 4) [15].

### Box 2 Criteria for POTS Diagnosis

- Orthostatic tachycardia
  - Heart rate increases  $\geq 30$  bpm OR to 120 bpm with standing 5–10 min
    - Only sinus tachycardia

- No orthostatic hypotension
  - (Defined as decrease 20/10 mm Hg BP)
- Symptoms:
  - Persist at least 6 months
  - Are disabling
  - Occur with standing, resolve with lying supine
- No identifiable conditions to cause tachycardia
  - Prolonged bed rest
  - Medications (vasodilators, diuretics, antidepressants)
  - Dehydration
  - Anemia/active bleeding
  - Hypothyroidism

### **Box 3 Common Symptoms with POTS**

- Mental cloudiness
- Blurred/tunneled vision
- Shortness of breath
- Palpitations
- Tremulousness
- Chest pain
- Headache
- Lightheadedness
- Nausea
- Extreme fatigue
- Exercise intolerance

### **Box 4 POTS Treatment**

- Hydration
  - 8–10 cups water daily
- Dietary salt
  - 200–300 mEq daily

- Waist-high elastic support hose
- Exercise
  - Aerobic and resistance training
    - 30 min, every other day

Orthostatic hypotension is also related to fibromyalgia. In an interesting study, 20 patients with fibromyalgia and 20 controls were subjected to tilt table testing [16]. An abnormal drop in blood pressure occurred in 60% of the fibromyalgia patients and none of the controls ( $P < 0.001$ ). Furthermore, all of the 18 fibromyalgia patients able to tolerate tilting for  $>10$  min experienced aggravation of fibromyalgia pain during testing, while controls did not report pain.

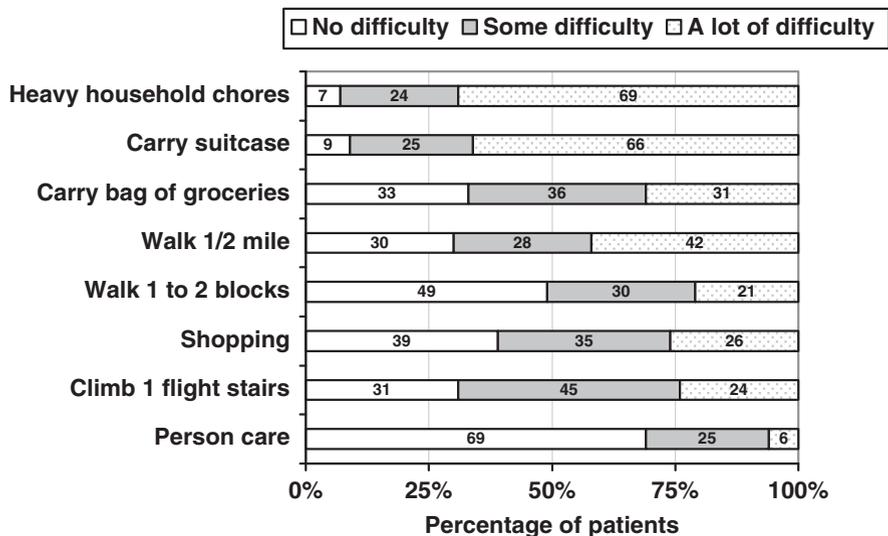
## Fibromyalgia Burden

Fibromyalgia can have substantial impact on patients' lives, despite the lack of limitations noted on physical examination in most fibromyalgia patients. A survey of women utilizing the National Fibromyalgia Association Web site ( $N = 1,735$ ) reported substantial disability with fibromyalgia [17]. Most women reported difficulty with activities of daily living beyond personal care (Fig. 5).

### Practical pointer

Fibromyalgia is associated with substantial disability. One in every 3–5 fibromyalgia patients reports a lot of difficulty with walking 1–2 blocks, climbing stairs, shopping, and carrying groceries.

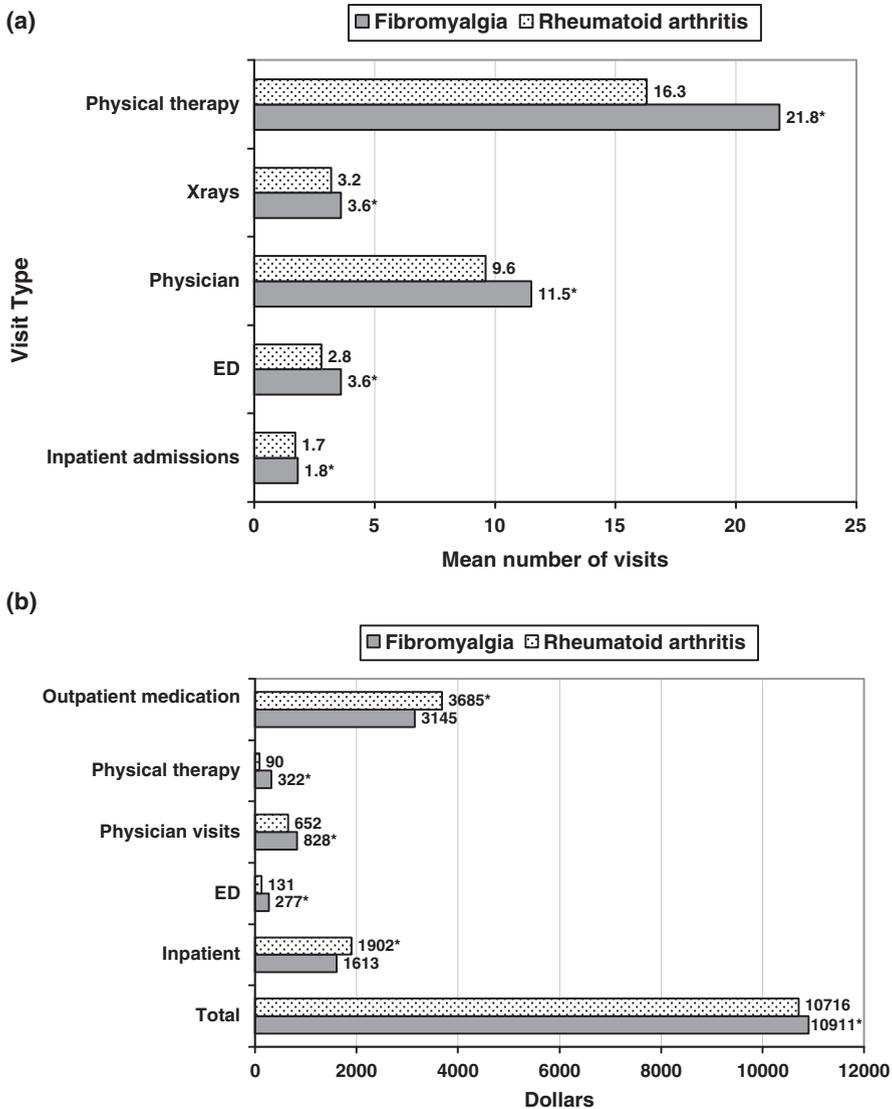
Employment may also be negatively affected by fibromyalgia. One study compared work status in 136 fibromyalgia patients and age- and sex-matched controls who were being treated for non-rheumatologic conditions [18]. Work at the time of medical diagnosis was compared with current work situation at the time of study evaluation. Patients with fibromyalgia were significantly less likely to still be employed in the same job that they had at the time of their disease diagnosis compared with those without fibromyalgia (19% vs. 58%,  $P < 0.0001$ ). Job was lost due to the medical condition for 47% with fibromyalgia and 14% with other conditions. Furthermore, 7% of fibromyalgia and 5% of non-fibromyalgia patients additionally switched jobs due to their medical condition. In another



**Fig. 5** Difficulty performing activities of daily living with fibromyalgia (based on Jones [17]). Heavy household chores would include scrubbing floors, vacuuming, or raking leaves

study, employees with fibromyalgia ( $N = 8,513$ ) lost more work days annually compared with either employees with osteoarthritis ( $N = 8,418$ ) or controls ( $N = 7,260$ ) [19]. Both patient groups were actively involved with medical treatment for their respective conditions. Total days lost in 1 year were 30 days for employees with fibromyalgia vs. 26 for arthritis vs. 10 for controls (difference vs. fibromyalgia patients was significant for both arthritis and controls,  $P < 0.0001$ ). Consequently, fibromyalgia patients were absent from work on 15% of all possible work days over 1 year, about three times the loss seen with controls.

Despite the seemingly unremarkable physical examination findings in most patients with fibromyalgia, disease impact is similar for patients with fibromyalgia or those with rheumatoid arthritis, who likely have widespread pain but examinations with obvious physical findings. In an interesting study evaluating female outpatients with widespread pain from either fibromyalgia ( $N = 62$ ) or rheumatoid arthritis ( $N = 60$ ), sleep, physical function, and social function were similarly impaired in both groups [20]. Similarly, a comparison of the economic burden with two populations with chronic widespread pain (fibromyalgia [ $N = 14,034$ ] and rheumatoid arthritis [ $N = 7,965$ ]) showed substantial burden with both conditions [21]. Results of a 12-month analysis are shown in Fig. 6. In general, the burden of illness and direct costs with fibromyalgia were considerable and comparable to that seen with rheumatoid arthritis. Fibromyalgia patients utilized more healthcare visits, including emergency department, physician, and physical therapy visits, as well as inpatient hospitalizations and x-ray visits, compared with rheumatoid arthritis patients ( $P < 0.05$ ).



**Fig. 6** Healthcare utilization and costs in patients with fibromyalgia vs. rheumatoid arthritis (based on Silverman [21]). **(a)** Healthcare appointments, **(b)** healthcare expenditures. \*Significantly between-group differences,  $P < 0.05$

## Summary

- Fibromyalgia is experienced as widespread pain, lasting  $\geq 3$  months, with at least 11 positive tender points on physical examination.

- Fibromyalgia patients characteristically report an abundance of non-pain-related symptoms, including neurological disturbances, gastrointestinal, chronic fatigue, and psychological distress.
- Non-pain symptoms tend to improve over time.
- Fibromyalgia affects about 2–3% of adults in North and South America and Europe, with a substantially lower prevalence in China.
- Women are about three times more likely to have fibromyalgia than men.
- Fibromyalgia prevalence increases in women, peaking between ages 54–64 years old and then decreasing. The prevalence in men is fairly constant across ages.
- Fibromyalgia is co-morbid with a diversity of medical and psychological conditions. Autonomic dysfunction (POTS) shares many clinical features with fibromyalgia and may also occur co-morbidly.
- Despite lack of physical limitations on examination noted in many patients with fibromyalgia, the burden of fibromyalgia is similar to that seen with rheumatoid arthritis, another chronic, widespread pain condition.

## References

1. Wolfe F, Smythe HA, Yunus MB, et al. 1990 The American College of Rheumatology 1990 criteria for the classification of fibromyalgia. *Arthritis Rheum.* 1990;33:160–72.
2. Bennett RM, Jones J, Turk DC, Russell IJ, Matallana L. An internet survey of 2,596 people with fibromyalgia. *BMC Musculoskeletal Disorders.* 2007;8:27.
3. Van Ittersum MW, van Wilgen CP, Hilberdink WA, Groothoff JW, van der Schans CP. Illness perceptions in patients with fibromyalgia. *Patient Educ Couns.* 2009;74:53–60.
4. Senna ER, De Barros AL, Silva EO, et al. Prevalence of rheumatic diseases in Brazil: a study using the COPCORD approach. *J Rheumatol.* 2004;31:594–7.
5. Marcus DA. Fibromyalgia: diagnosis and treatment options. *Gender Medicine.* 2009;6:139–51.
6. Lawrence RC, Fleson DT, Helmick CG, et al. Estimates of the prevalence of arthritis and other rheumatic conditions in the United States. Part II. *Arthritis Rheum.* 2008;58:26–35.
7. McNally JD, Matheson DA, Bakowsky VS. The epidemiology of self-reported fibromyalgia in Canada. *Chronic Dis Can.* 2006;27:9–16.
8. Branco JC, Bannwarth B, Failde I, et al. Prevalence of fibromyalgia: a survey of five European countries. *Semin Arthritis Rheumat.* 2010;39:448–53.
9. Zeng QY, Chen R, Darmawan J, et al. Rheumatic diseases in China. *Arthritis Res Ther.* 2008;10:R17.
10. Reisine S, Fifield J, Walsh, Forrest DD. Employment and health status changes among women with fibromyalgia: a five-year study. *Arthritis Care Res.* 2008;59:1735–41.
11. Weir PT, Harlan GA, Nkoy FL, et al. The incidence of fibromyalgia and its associated comorbidities: a population-based retrospective cohort study based on International Classification of Diseases, 9th Revision Codes. *J Clin Rheumatol.* 2006;12:124–8.
12. Thieben MJ, Sandroni P, Sletten DM, et al. Postural orthostatic tachycardia syndrome: the Mayo clinic experience. *Mayo Clin Proc.* 2007;82:308–13.
13. Staud R. Autonomic dysfunction in fibromyalgia syndrome: postural orthostatic tachycardia. *Curr Rheumatol Rep.* 2008;10:463–6.
14. Hoad A, Spickett G, Elliott J, Newton J. Postural orthostatic tachycardia syndrome is an under-recognized condition in chronic fatigue syndrome. *QJM.* 2008;101:961–5.
15. Joyner MJ, Masuki S. POTS versus deconditioning: the same or different? *Clin Auton Res.* 2008;18:300–7.

16. Bou-Holaigah I, Calkins H, Flynn JA, et al. Provocation of hypotension and pain during upright tilt table testing in adults with fibromyalgia. *Clin Exp Rheumatol*. 1997;15:239–46.
17. Jones J, Rutledge DN, Jones KD, Matallana L, Rooks DS. Self-assessed physical function levels of women with fibromyalgia: a national survey. *Women's Health Issues*. 2008;18:406–12.
18. Al-Allaf. Work disability and health system utilization in patients with fibromyalgia syndrome. *J Clin Rheumatol*. 2007;13:199–201.
19. White LA, Birnbaum HG, Kaltenboeck A, et al. Employees with fibromyalgia: medical comorbidity, healthcare costs, and work loss. *J Occup Environ Med*. 2008;50:13–24.
20. Ofluoglu D, Berker N, Güven Z, et al. Quality of life in patients with fibromyalgia syndrome and rheumatoid arthritis. *Clin Rheumatol* 2005;24:490–2.
21. Silverman S, Dukes EM, Johnston SS, et al. The economic burden of fibromyalgia: comparative analysis with rheumatoid arthritis. *Curr Med Res Opin*. 2009;25:829–40.



<http://www.springer.com/978-1-4419-1608-2>

Fibromyalgia

A Practical Clinical Guide

Marcus, D.A.; Deodhar, A.

2011, XII, 200 p. 65 illus., Softcover

ISBN: 978-1-4419-1608-2