

Disability in Fibromyalgia Associates with Symptom Severity and Occupation Characteristics

Mary-Ann Fitzcharles, Peter A. Ste-Marie, Emmanouil Rampakakis, John S. Sampalis, and Yoram Shir

ABSTRACT. Objective. It is intuitive that disability caused by illness should be reflected in illness severity. Because disability rates for fibromyalgia (FM) are high in the developed world, we have examined disease and work characteristics for patients with FM who were working, unemployed, or receiving disability payments for disability as a result of FM.

Methods. Of the 248 participants in a tertiary care cohort study of patients with FM, 90 were employed, 81 were not employed and not receiving disability payments, and 77 were not working and currently receiving disability payments awarded for disability caused by FM. Demographic, occupation, and disease characteristics were compared among the groups.

Results. The prevalence of disability caused by FM was 30.8%. There were no demographic differences among the working, unemployed, or disabled patients. With the exception of measures for anxiety and depression, all measurements for disease severity differed significantly among the groups, with greater severity reported for the disabled group, which used more medications and participated less in physical activity. Disabled patients were more likely previously employed in manual professions or the service industry, whereas employed patients were more commonly working in non-manual jobs that included clerical, managerial, or professional occupations ($p = 0.005$).

Conclusion. The one-third rate of disability for this Canadian cohort of patients with FM is in line with other reports from the western world. Associations of disability compensation were observed for subjective report of symptom severity, increased use of medications, and previous employment in more physically demanding jobs. (First Release March 15 2016; J Rheumatol 2016;43:931–6; doi:10.3899/jrheum.151041)

Key Indexing Terms:

FIBROMYALGIA

SYMPTOM SEVERITY

DISABILITY

OCCUPATION

When disease precludes a person of working age from gainful employment, most societies have established a mechanism of monetary compensation that provides the individual and family with some financial security. The past 2 decades have seen a progressive increase in persons in North America receiving disability payments, with an increase of almost 50% for all disease causes recorded for the US Social Security Disability and Supplemental Security Income between 1995 and 2010¹. Rates of reported disability because of fibromyalgia (FM) in the United States have followed a

similar trend with disability rates doubling from 16% to 34% over the last 2 decades^{2,3}. This high rate of disability is particularly troubling because FM is most prevalent in middle-aged women, a time when productivity should be optimal. Reasons for work disability for any chronic illness may be due to the innate characteristics of the illness, the specific physical and mental demands of the work, and also the psychosocial context that describes the personal characteristics of the individual within their social milieu.

FM is a syndrome complex encompassing a variety of subjective core symptoms that may fluctuate over time and can include widespread body pain, sleep disturbance, fatigue, cognitive dysfunction, and mood disorder among others, and is no longer viewed as a categorical disorder, but rather a dimensional condition with a spectrum of severity⁴. In view of this complexity, persons with FM may report sufficient severity that precludes gainful employment, but specific factors contributing to disability require understanding.

There may be numerous reasons why persons with FM may have poor sustainability in the workforce. Studies have pointed to work disability associating with higher ratings of pain and symptom severity, increased physical demands of the job or alternately more sedentary work, and workplace stressors, whereas continued work is promoted by individual

From the Alan Edwards Pain Management Unit, McGill University Health Centre; Division of Rheumatology, McGill University Health Centre; Jewish General Hospital, McGill University, Montreal; JSS Medical Research, Saint Laurent, Quebec, Canada.

M.A. Fitzcharles, MB, ChB, Alan Edwards Pain Management Unit, McGill University Health Centre, and the Division of Rheumatology, McGill University Health Centre; P.A. Ste-Marie, BA, LL.B, Alan Edwards Pain Management Unit, McGill University Health Centre; E. Rampakakis, PhD, JSS Medical Research, and the Jewish General Hospital, McGill University; J.S. Sampalis, PhD, JSS Medical Research, and the Jewish General Hospital, McGill University; Y. Shir, MD, Alan Edwards Pain Management Unit, McGill University Health Centre.

Address correspondence to Dr. M.A. Fitzcharles, Montreal General Hospital, 1650 Cedar Ave., Montreal, Quebec H3G 1A4, Canada.

E-mail: Mary-ann.fitzcharles@muhc.mcgill.ca

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strategies such as the ability to handle symptoms, work day, and longterm work life, as well as social support from colleagues and employers^{5,6,7,8,9,10}.

As a counterargument, the increased awareness of FM combined with the subjectivity of complaints may have nurtured a growing societal concept of disability. Measurement of function in FM is also fraught with challenge, with a patient's report of functional impairment often greater than objective observation, and self-report of physical activity showing poor agreement with objective measurement by accelerometry^{11,12}. To better understand factors that may be contributing to work disability, we examined patients with FM currently working compared with those unemployed for non-FM reasons, and those receiving disability payments for illness identified as FM.

MATERIALS AND METHODS

Patients. All patients with FM in our prospective observational cohort were referred to the Alan Edwards Pain Management Unit, a tertiary care multi-disciplinary center, from January 2005 with continued entry. The study cohort has previously been described¹³. The diagnosis of FM was confirmed by the study rheumatologist (MAF). Excluded were patients with some other diagnosis as the primary cause for pain, as well as those who refused to participate or were unable to answer questionnaires in French or English. The registry was approved by the institutional review board of the Montreal General Hospital, and all patients signed informed consent.

For this cohort, there was no predetermined treatment plan, with patients treated individually in a tailored approach incorporating nonpharmacological and pharmacological treatments. Patients were categorized into 3 groups at baseline: those working if they were currently gainfully employed and reported any remunerative activity, either part-time or full-time; those unemployed for non-FM related reasons; and those disabled if they were not working and receiving disability payments, with the primary diagnosis for disability identified as FM.

Measurements. Baseline data included demographic, disease-related, and occupational information. Demographic information included age, sex, education level, marital status, previous or current employment type, and current working status. Symptom and disease-related information included measurements of pain, quality of life, function, and mood. The number of medications used was recorded. Health-related physical activity was recorded as present if the subject reported participation in any specific physical activity or physical activity program that was beyond normal daily function, or absent if physical activity was only that related to usual daily activity.

Assessments of pain. Current pain was measured by the following: pain intensity with a 10-cm visual analog scale (VAS), anchored as "no pain" and "most severe pain"; pain quality with the McGill Pain Questionnaire (MPQ), a validated questionnaire consisting of 78 descriptor words arranged into 20 subgroups and measuring the sensory, affective, evaluative, and miscellaneous components of pain¹⁴; and pain interference with the Pain Disability Index (PDI), a generic measure of pain-related interference with role functioning in 7 areas (occupational, home/family, recreational, social, sexual, activities of daily living, and life support), all rated on an 11-point Likert-type scale (0 = no disability, 10 = complete disability)¹⁵.

Measurements of quality of life and function. Quality of life and function were measured by the Fibromyalgia Impact Questionnaire (FIQ), a condition-specific, reliable, and validated measure for patients with FM with a total score out of 100 (higher scores represent poorer quality of life¹⁶). Adjustments to the scoring of the FIQ were made for those not currently working. Patient's global assessment (PtGA) of disease was assessed with the question "considering all the ways in which illness and health conditions

may affect you at this time, please make a vertical mark below to show how you are doing," measured by a 10-cm VAS, anchored as "very well" and "very poorly." Function was measured by the Health Assessment Questionnaire (HAQ), a generic questionnaire that measures outcome in patients with rheumatic diseases¹⁷.

Psychological variables. Mood was assessed using the Arthritis Impact Measurement Scale for anxiety and depression¹⁸. Catastrophizing because of pain was measured with the Pain Catastrophizing Scale (PCS), a 13-item scale that addresses thoughts and feelings related to pain with scores ranging from 0 to 52, with total score up to 20 indicating low levels of catastrophizing, 21–30 moderate, and 31–52 high levels of catastrophizing¹⁹.

Statistical analysis. Descriptive statistics, including the mean and SD for continuous scale variables and frequency distributions for categorical scale variables, were produced for all patient variables. In addition to the total study cohort and the total analysis cohort, all analyses were stratified by disability status. Between-group differences in categorical and continuous scale variables were assessed for statistical significance with the chi-square test and the 1-way ANOVA, respectively. Multivariate logistic regression was used to assess the independent association of sociodemographic (age, level of education) or disease-related information (PtGA, pain duration) and disability status, and the saturated model is presented. In our analysis, only patients employed or disabled were included. All statistical analyses were performed using SPSS 12.0 for Windows (SPSS Inc.).

RESULTS

Of the 298 patients referred to the FM clinic, 20 did not fulfill criteria for FM and had some other diagnosis, 28 refused consent to participate or withdrew consent, and 2 had missing data and were excluded. The final study cohort consisted of 248 patients who were recruited and provided informed consent to participate in the registry beginning July 2005. Demographic and disease-related variables at entry for the total cohort and with subdivision into the 3 groups of employed, unemployed, and disabled are shown in Table 1. The mean age of the study participants was 47.9 ± 10.3 years, 91% were women, and the mean disease duration was 10.8 ± 9.8 years. The analysis cohort included the following 3 groups: the employed group consisting of the patients who were currently employed ($n = 90$, 36%), the unemployed group consisting of those not gainfully employed for reasons other than FM ($n = 81$, 33%), and the disabled group consisting of the patients who were receiving disability payments ($n = 77$, 31%). None of the 81 patients who were unemployed were currently receiving disability compensation.

The prevalence of disability was 30.8%. Table 1 shows baseline demographic and disease-related variables for the study groups. There were no significant between-group differences in demographic variables, although disabled and unemployed patients were numerically older than employed patients. Occupation differed between the groups with disabled patients more likely to have been previously employed in manual professions or the service industry, and employed patients more likely to be working in clerical or professional jobs that included education and health fields ($p = 0.005$). Cigarette smoking ($p = 0.015$), but not herbal cannabis use ($p = 0.130$), was more common for the disabled group.

Table 1. Baseline demographic and disease-related information assessed according to working or disability status. Values are n (%) or mean \pm SD unless otherwise specified.

Variable	Total, n = 248	Employed, n = 90	Unemployed, n = 81	Disabled, n = 77	p
Age, yrs	47.9 \pm 10.3	45.9 \pm 9.8	49.0 \pm 12.7	49.1 \pm 7.7*	0.066
Sex					0.576
Female	226 (91)	80 (89)	74 (91)	72 (94)	
Male	22 (9)	10 (11)	7 (9)	5 (7)	
Marital status					0.493
Single	54 (22)	23 (26)	13 (17)	18 (24)	
Married	153 (63)	58 (64)	50 (64)	45 (59)	
Divorced	28 (12)	6 (7)	11 (14)	11 (15)	
Widowed	9 (4)	3 (3)	4 (5)	2 (3)	
Prior/current occupation					0.005
Manual	9 (6)	0 (0)	1 (4)	8 (15)*	
Service	40 (26)	14 (19)	10 (39)	16 (29)*	
Education/health/office	61 (39)	37 (49)	9 (35)	15 (27)*	
Professional	42 (27)	21 (28)	5 (19)	16 (29)*	
Student	4 (3)	3 (4)	1 (4)	0 (0)*	
Cigarette use	56 (23)	14 (16)	16 (20)	26 (34)*	0.015
Medication count	2.2 \pm 1.5	1.7 \pm 1.3	2.4 \pm 1.5*	2.7 \pm 1.5*	< 0.001
Opioid use	62 (25)	10 (11)	27 (33)*	25 (33)*	0.001
Antidepressant use	139 (56)	40 (44)	52 (64)*	47 (61)*	0.019
Tranquilizer use	62 (25)	12 (13)	19 (24)	31 (40)*	< 0.001
Cannabinoid use	23 (9)	4 (4)	9 (11)	10 (13)*	0.130
Alcohol abuse	11 (4)	2 (2)	4 (5)	5 (7)	0.395
Drug abuse	11 (4)	3 (3)	4 (5)	4 (5)	0.814
Exercise activity	75 (30)	37 (41)	21 (26)*	17 (22)*	0.017
Pain duration, yrs	10.8 \pm 9.8	11.9 \pm 10.8	11.1 \pm 10.2	9.3 \pm 7.9	0.229
Pain VAS	6.5 \pm 2.3	5.5 \pm 2.3	6.9 \pm 2.1*	7.3 \pm 2.0*	< 0.001
PtGA	6.6 \pm 2.2	5.6 \pm 2.2	7.1 \pm 1.9*	7.2 \pm 2.2*	< 0.001
MPQ	40.8 \pm 15.3	36.7 \pm 13.7	40.7 \pm 14.7	45.8 \pm 16.2*	0.001
PDI	37.7 \pm 14.5	31.1 \pm 13.4	39.3 \pm 13.7*	43.6 \pm 13.5*	< 0.001
PCS	29.4 \pm 12.2	26.7 \pm 11.4	29.9 \pm 11.5	32.1 \pm 13.3*	0.016
FIQ	67.0 \pm 16.8	59.7 \pm 15.0	69.1 \pm 17.6*	73.7 \pm 14.9*	< 0.001
HAQ	1.13 \pm 0.66	0.86 \pm 0.68	1.15 \pm 0.56*	1.41 \pm 0.60*	< 0.001
AIMS anxiety	6.3 \pm 1.8	6.2 \pm 2.0	6.4 \pm 1.5	6.5 \pm 1.9	0.564
AIMS depression	4.9 \pm 1.8	4.8 \pm 1.9	4.7 \pm 1.8	5.3 \pm 1.8	0.131

* P < 0.05 when compared with employed patients. VAS: visual analog scale; PtGA: patient's global assessment; MPQ: McGill Pain Questionnaire; PDI: Pain Disability Index; PCS: Pain Catastrophizing Scale; FIQ: Fibromyalgia Impact Questionnaire; HAQ: Health Assessment Questionnaire; AIMS: Arthritis Impact Measurement Scale.

Significant between-group differences were observed for a number of management strategies with disabled patients reporting the highest count of FM medications ($p < 0.001$), more frequently using opioids ($p = 0.001$) and tranquilizers ($p < 0.001$), and participating less in exercise activity ($p = 0.017$) as compared with the other 2 groups. Antidepressant use was also significantly different with 61% of disabled patients, 64% of unemployed patients, and 44% of employed patients treated with tricyclic or other antidepressants ($p = 0.019$).

Except for depression, anxiety, and pain duration, all other variables differed significantly between the groups with higher values noted in the disabled group: pain VAS ($p < 0.001$), PtGA ($p < 0.001$), MPQ ($p = 0.001$), PDI ($p < 0.001$), PCS ($p = 0.016$), FIQ ($p < 0.001$), and HAQ ($p < 0.001$).

In multivariate analysis of employed and disabled patients, older age (OR 1.07, 95% CI 1.02–1.12) and higher PtGA (OR

1.38, 95% CI 1.17–1.63) were associated with significantly higher odds of being disabled, while longer duration of pain (OR 0.94, 95% CI 0.90–0.98) and higher level of education (college vs high school or less: OR 0.60, 95% CI 0.26–1.39; university vs high school or less: OR 0.35, 95% CI 0.14–0.87) were associated with lower odds of disability. Similar results were obtained when using other disease variables instead of PtGA as measures of disease severity.

DISCUSSION

One-third of patients with FM in our study cohort were receiving disability compensation from a private or public insurer because of work disability attributable to FM. Significant differences were observed among all 3 groups for disease severity measures, with the disabled group reporting more severe symptoms for all measures. Compared with those working, those on disability were numerically older,

were using more pharmacotherapy, were less physically active, and were more likely to have been employed in unskilled and more physically demanding jobs. Greater use of medications for management of FM may be interpreted to reflect disease severity, but may also have contributed to poor global status because of adverse effects of medication. Apart from the innate severity of the disease, poor health-related physical activity, societal, and work-related factors may contribute to disability rates.

Similar to our study, reported disability rates for FM in the United States and Europe are about 30%^{2,3,20,21}. These rates are also similar to reports for persons with rheumatoid arthritis (RA) and osteoarthritis (OA), but with the rates for these diseases increased with concomitant FM. In the study by Wolfe, *et al*, disability payments by private insurers were not recorded, with the possibility that disability rates may be even higher³. Besides symptom severity, predictors for disability for FM were the functional status measured by the HAQ and the physical and mental components of the Medical Outcomes Study Short Form-36³. Similar disability rates were reported for 100 Canadian-community patients with FM compared with pain and general controls, with disability rates 31% versus 11% versus 2%, respectively, with a higher FIQ score as a predictor of work disability in the patients with FM²². In the Netherlands, patients with FM had a disability rate similar to those with ankylosing spondylitis, but lower than for chronic low back pain: 31% versus 34% versus 71%, respectively²¹. Concomitant FM was also identified as a risk factor for work disability in patients with systemic lupus erythematosus²³. Longitudinal studies also provide evidence that working persons with a rheumatic disease, and particularly FM, have an increased risk of disability over time. In a 10-year followup study of working persons in the Netherlands, self-reported rheumatic disease, especially FM, was a risk for disability: FM (HR 14.2, 95% CI 2.0–16.5), OA (HR 12.4, 95% CI 1.6–13.7), and inflammatory rheumatic diseases (HR 8.4, 95% CI 1.1–62.4)²⁴.

Just over a third of patients in our study cohort were employed, a number considerably less than the current employment rate of 57% for Canadian women²⁵. Although those receiving disability payments were older with an average age of 49 years, this age is still well within the age range for employability for women. Another factor to consider regarding the low employment rate in our study is the question of “hidden work disability.” It is possible that some patients were unemployed for health-related reasons, but had either not applied for disability compensation or had been unsuccessful in their application. In the province of Quebec, Canada, all persons with illness sufficiently severe to preclude employment are eligible for either privately or publicly funded disability payment after due process of adjudication, which includes medical reports, medical recommendations, and judgment by the courts if needed. Working patients with FM are generally reported to have less severe

symptoms and better quality of life than those unemployed, but without evidence that working positively affects health^{26,27,28}. Younger age, patient perception of efficacy of a rehabilitation intervention, and larger social networks were associated with continued paid employment²⁶. In a Scottish study, working patients with FM were, however, less likely to continue in their same job 6 years after disease onset, and were also more likely to lose their job compared with nonrheumatic hospital attendees²⁹. Working persons with FM also incur more short-term disability days compared with persons with RA³⁰. Compared with persons with OA and controls, patients with FM missed about 15% of working days, a number 3 times higher than controls and significantly higher than for OA³¹. Workplace adaptations have been reported for patients with FM with up to a third of 176 patients changing working hours and over half changing working situation or tasks³².

There is limited information to explain the high rate of disability observed in both our present and other studies. The specific burden of symptoms has been identified in both our present study and others as a discriminator for disability^{3,5,6,7,8}. Because FM is characterized by variability of symptoms, any 1 or combination thereof may contribute to disability at a particular time. Although pain is the primary focus of this condition, fatigue and cognitive effects may be important contributors to work loss. Fatigue, present for over 90%, may be involved in work-related issues by contributing to presenteeism (reduced workplace productivity because of illness). Pain rather than fatigue was, however, deemed a more important factor in relation to work status in a study of 129 women of working age with FM, as reported by Palstam, *et al*⁶. Severe pain compromised work, whereas fatigue was better tolerated, and women reporting severe fatigue worked⁶. Therefore, it might be surmised that symptom severity as well as the unpredictability of symptoms are factors in determining work attendance and ability to continue working³³.

Both the work environment as well as the job description have been shown to affect work status in persons with FM^{8,9,10,34}. Social support from colleagues and employers, the ability to exercise control over the work day, and a non-stressful work environment are factors that promote continued work^{9,10,34}. We do not have information in our present study on work environment factors, other than patient report of the job. Our findings concur with the observations of most others that those performing more physically demanding jobs were more likely to be disabled, with physical demands of a job as well as personal satisfaction with the work environment increasingly recognized to be involved in work retention. In contrast, Rivera, *et al* reported that temporary work disability was associated with sedentary work, but also with disease-related factors contributing to the effect⁸. Patients' perceived physical limitation was reported to predict employment status better than affective symptoms or perceived pain³⁵. Higher physical function in general for

patients with FM was associated with younger age, higher education, less fatigue, less medication use, and more exercise activity³⁶. Psychosocial factors and monotonous work also predicted onset of body pain over a 2-year period for new employees³⁷. The extent to which the work environment, especially the physical demands, can or should be accommodated for persons with FM is unknown and remains mostly speculative. Finally, motivation to remain in the workforce may be lacking for some and may be influenced by the workplace environment, with those with less satisfying jobs less likely to be motivated to remain working. Socioeconomic status, low level of education, physical work, as well as mood disorder were all associated with attendance at a worker's compensation clinic for those diagnosed with FM³⁸. Financial incentives to remain working must also be involved, especially for those with lesser-paying jobs, because the monetary differential between employment and disability payments may be minimal because the social system allows for a monthly fixed disability payment in addition to a percentage of the calculated retirement pension, with estimates of millions of Canadian dollars a year in payments³⁹.

Factors that may lead a person with FM to an application for disability pension may not be entirely disease-related and may reflect employment issues such as loss of a job for other reasons and then inability to find a new job, with the burden of perceived effort overwhelming. Even so, the adjudication of disability in Canada is reliant entirely on the assessment of the medical condition. Another possible explanation for this high rate of disability in FM may arise from the societal concept of disability that has gradually permeated the social media about this condition in recent years. An element of entitlement may pervade when persons are given a diagnostic label, especially when this label has led to the allocation of disability benefits for others. Societal marketing, with advocacy from various groups including the legal community, may have influenced this perception of entitlement. Considering the high rate of disability for FM, particularly noted in North America, willingness to work in the presence of ongoing symptoms may be a contributing factor. The challenge of assessing illness severity when reliant solely on subjective patient report is currently reflected by the courts emphasizing the importance of the reliability of the claimant in matters of adjudication⁴⁰.

Our study has a number of strengths. First, we have recorded all forms of disability awards, both by private and public insurers. Second, all patients identified as "on disability" were receiving this award specifically for the condition of FM, according to the patient report. In Canada, FM is recognized as a specific medical condition that may cause severity of symptoms sufficient to impair functionality and preclude full-time gainful employment. Third, all patients were participants in a cohort study at a single center and were evaluated face to face, rather than reliance on mailed self-reported questionnaires.

We acknowledge limitations to our study. First, ours is a single-center study of patients in a specialized FM clinic located in a university chronic pain management center, suggesting that study patients may have had more severe disease. Second, management in a pain center may be an independent factor that addresses the severity of condition and thereby enhances the credibility of subjective report and impairment. We also do not have information on the work record or record of sick leave prior to obtaining a disability status, which could have pointed to the struggle to remain in the workforce. Finally, our results should be interpreted with caution because no causal inference can be made owing to the cross-sectional design of our analysis and the unknown time of disability with reference to the baseline study date.

The 30% rate of disability for patients with FM in our study is in line with reports from the United States and Europe. Other than symptom severity, work-related variables as measured by previous job type were associated with disability compensation. While symptom severity may be explained by true disease characteristics, adverse effect of medications, or patient perception of illness, we caution against unconditional acceptance of subjective report. Justification for ongoing disability may augment subjective illness report. The 2012 Canadian Fibromyalgia Guidelines have recommended that patients with FM remain in the labor force, and if not working they should be offered a rehabilitation program to facilitate the return to work⁴¹.

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