

# Sex Differences in Psychological Response to Pain in Patients with Fibromyalgia Syndrome

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## Introduction

Fibromyalgia Syndrome (FMS) is a common chronic pain disorder, and has a significantly higher occurrence in women compared to men, with a ratio ranging from 8:1 to 9:1 in tertiary care Centres<sup>1</sup>.

Even though many non-systematic reviews conclude that women experience greater pain severity and are more physically- and psychologically-disabled by pain than men, these conclusions can be questioned because a large number of studies have found no sex differences and some studies find results in the opposite direction<sup>2-5</sup>.

These same problems plague the FMS sex/gender literature, preventing us from drawing any conclusions.

The extent to which reliable sex differences in pain coping and pain-related beliefs exist in FMS populations is not known.

Given the influence that sex differences could have on the development of more effective FMS treatment protocols, further research is needed to understand the similarities and differences between women and men in their experience of FMS.

## Objective and Hypotheses

To examine whether men and women with FMS differ in terms of their pain and functioning (depressive symptoms, pain severity and interference), pain-related beliefs, and pain-related coping.

**Hypothesis 1:** No sex differences will be found with respect to measures of pain and functioning.

**Hypothesis 2:** Some sex differences will be observed between men and women in how they view and cope with FMS-related pain

## Methodology

**Study design:** Cross-sectional analysis

**Population:** Cohort of patients with FMS referred consecutively by their family physician or by their rheumatologist to The Fibromyalgia Day Program at St. Joseph's Health Care London, Ontario, Canada.

**Procedure:** At their pre-admission visit, patients completed an online set of questionnaires used to obtain relevant information for clinical and research purposes.

**Main eligibility criteria:**

- Age ≥ 18 years
- Meet ACR 1990 or 2010 diagnosis criteria for FMS
- Available on a daily basis for four consecutive weeks
- Willing to eliminate the use of opioid analgesics and sedatives for treatment of FMS symptoms and short-term pain relief techniques for FMS
- Able to provide informed consent

## Analysis and Results

**Sample Description:**

- A total of 795 individuals (747 women and 48 men) completed the initial online questionnaires.
- A set of comparisons (t-test and/or chi-squared test (χ<sup>2</sup>)) were first conducted for socio-demographic variables and pain characteristic measures.
- With regard to socio-demographic variables (see section A Table 1), men with FMS (45 years ± 9) were significantly younger than their female counterparts (49 years ± 11) whereas no other sex difference was observed.
- Men and women reported comparable results with respect to all pain characteristics measures (see section B, Table 1).

**Table 1:** Sample characteristics of men and women patients with FMS

Demographic Measures	Women (n = 747)	Men (n = 48)	P-Value	ES
<b>A. Socio-demographic variables (mean (SD) or % of yes)</b>				
Age	48.64 (11.16)	45.08 (9.43)	0.031	0.345
In a relationship	61.2	60.4	0.916	0.012
Employed - % yes	25.2	16.7	0.185	0.047
Receiving disability compensation	17.0	27.1	0.075	0.063
<b>B. Pain characteristics (mean (SD))</b>				
Total number of pain localisations (0 to 5)	4.86 (0.45)	4.85 (0.51)	0.875	0.021
Total number of additional FMS somatic symptoms (0 to 5)	3.63 (1.35)	3.63 (1.30)	0.983	< 0.001
Total number of rheumatology diseases (excluding FMS) (0 to 7)	0.20 (0.47)	0.08 (0.28)	0.090	0.310

\*Effect size (ES):  
1) Cohen's d was calculated for mean group differences on categorical variables, where d ≤ 0.20 = small ES, d ≤ 0.50 = moderate ES, and d ≤ 0.80 = large ES.  
2) Phi (Φ) was calculated for group differences on categorical variables, where Φ ≤ 0.10 = small ES, Φ ≤ 0.30 = moderate ES, and Φ ≤ 0.50 = large ES.

## References

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**Table 2:** Sex comparisons in tertiary care FMS patients

Outcome variables	Women (n = 747)	Men (n = 48)	P-Value	ES
<b>A. Pain and functioning</b>				
Center for Epidemiologic Studies - Depression (CES-D)	40.56 (11.32)	40.31 (10.26)	0.648	0.023
Multidimensional Pain Inventory (WHYMPI)				
- Pain Severity	5.32 (1.04)	5.70 (0.84)	0.024	0.402
- Interference	5.52 (1.02)	5.81 (0.92)	0.080	0.299
<b>B. Pain-related beliefs</b>				
Survey of Pain Attitudes (SOPA)				
- Control	3.34 (1.95)	3.15 (2.18)	0.693	0.092
- Disability	4.77 (2.20)	5.54 (2.30)	0.033	0.342
- Harm*	3.83 (2.01)	4.85 (1.85)	< 0.001	0.528
- Emotion	6.25 (1.91)	5.52 (1.89)	0.010	0.384
- Medication	5.74 (2.03)	5.65 (2.20)	0.951	0.043
- Solicitude	4.80 (2.26)	3.98 (2.57)	0.010	0.338
- Medical cure	2.80 (1.96)	3.00 (2.09)	0.436	0.104
<b>C. Pain-related coping</b>				
Chronic Pain Coping Inventory (CPCI)				
- Guarding	10.49 (3.54)	11.50 (3.42)	0.073	0.290
- Resting	11.86 (3.67)	12.42 (3.29)	0.311	0.160
- Asking for Assistance	9.68 (4.76)	8.75 (4.37)	0.155	0.203
- Relaxation	9.08 (4.55)	9.98 (3.81)	0.476	0.215
- Task Persistence	9.93 (4.06)	8.81 (5.25)	0.794	0.239
- Exercise/Stretching	9.64 (4.33)	10.56 (4.11)	0.133	0.218
- Seeking Social Support	7.34 (4.30)	6.35 (4.49)	0.104	0.225
- Coping Self-Statement	9.20 (4.03)	9.25 (4.27)	0.798	0.012
Patterns of Activity Measure–Pain (POAM-P)				
- Avoidant*	33.32 (7.83)	37.31 (7.32)	0.001	0.526
- Overdoing	33.52 (7.62)	32.02 (8.13)	0.129	0.191
- Pacing	32.41 (8.41)	35.29 (8.76)	0.013	0.334

\*Indicates a statistically significant difference between men and women (p ≤ 0.01) and a moderate ES (d ≥ 0.50).  
\*ANCOVA with age as a covariate, unstandardized mean and SD.  
\*Effect size (ES): Cohen's d was calculated for mean group differences on categorical variables; d ≤ 0.20 = small ES, d ≤ 0.50 = moderate ES, and d ≤ 0.80 = large ES.  
\*These variables have been transformed to meet homogeneity assumptions, but the unstandardized mean and SD are presented here for the purpose of clarity.

**Sex Comparisons:**

- A series of ANCOVA (with age as covariate) were used to examine sex differences in the study measures, with a p-value of ≤ 0.01 and at least a moderate effect size (Cohen's d ≥ 0.5) required for a difference to be deemed statistically significant.
- Our results revealed no sex differences in the measures of pain and functioning (see section A Table 2). However, a trend was observed towards men reporting more severe pain than women.
- For pain-related beliefs (see section B Table 2), no sex differences were observed except that men were more likely to view pain as reflecting harm. We observed a tendency for men to be more likely to report that they were disabled by pain. Additionally, we found a trend for women to endorse the belief that others, especially family members, should be more solicitous in response to their pain experience and also that their emotions impacted their pain to a greater extent than men.
- Results with respect to pain-related coping strategies (see section C Table 2) showed no sex difference with the exception that men were more likely than women to use activity avoidance as a pain coping strategy. There was also a non-significant trend for men to report that they paced themselves more when they engaged in doing an activity relative to women.

## Conclusions

- Confirming our study hypothesis 1 our findings suggest that no important differences exist between men and women with FMS referred for multidisciplinary treatment at a tertiary care Centre with regards to their pain or functioning (depression symptoms, pain severity or interference).
- Consistent with our hypothesis 2, we have observed some sex with respect to beliefs and pain-related coping strategies. Notably, men were more likely to view pain as an indication of tissue damage and that they should therefore avoid movement and exercise as well as being more likely than women to use activity avoidance as a pain coping strategy. We observed an interesting tendency where men were more likely than women to believe they were disabled by pain while women tended to believe that others should be more considerate of their pain, and also that their emotions have an impact on their pain.
- Although more information is necessary to draw firm conclusions regarding the reliability and

generalizability of our findings, our results suggest that women and men with FMS might benefit from somewhat different types of targeted psychosocial interventions, based on their beliefs and coping styles.

**Study limitations:**

- Marked inequality in representation between women (94%) and men (6%) somewhat diminish the statistical power of the study
- Results cannot necessarily be generalized to FMS populations (community, primary care) other than tertiary care centres patients interested and eligible in attending a multidisciplinary pain program
- Neither race/ethnicity or gender differences were measured
- Limited to patients who understood English
- all measures were cross-sectional and obtained via self-reported questionnaires

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