

## Clinical Characteristics of Korean Patients with Fibromyalgia

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### Abstract

#### Objective

Although fibromyalgia (FM) has been known to present a variety of clinical symptoms, a detailed investigation on this topic has not been performed in Korean patients. We tried to identify various FM-related symptoms and compare the clinical features of patients with FM.

#### Methods

Total 336 patients with FM were consecutively enrolled from 10 medical centers all over the country. Base survey included sociodemographic data, medical history, current or past FM symptoms, stressors, and current use of relevant medications. Instruments of FM assessment included tender points, FM impact questionnaire, 36-item medical outcomes study short-form health survey, brief fatigue inventory, beck depression inventory, state-trait anxiety inventory, arthritis self-efficacy scale, and social support.

#### Results

The following symptoms were exhibited by more than two-thirds of FM patients, in order of frequency: fatigue, unrefreshing sleep, generalized weakness, stiffness, tension headache, swelling, febrile sense, and dizziness. Stressors that triggered FM symptoms were found in 58.6% of the patients and can be listed in the following order: psychological distress, peripheral pain syndrome, catastrophic events, physical trauma, hormonal alteration, infections, and drugs. Compared to patients with primary FM, patients with secondary FM were significantly older, less educated, more Medical Aid beneficiaries, had more dizziness, received more NSAIDs and analgesics, and had higher levels of trait anxiety ( $p < 0.05$ ,  $p < 0.05$ ,  $p = 0.001$ ,  $p < 0.05$ ,  $p < 0.01$ ,  $p < 0.01$ , and  $p < 0.05$ , respectively).

#### Conclusion

The range of FM symptoms in the Korean population are similar to the Western population. The frequency of general and extra-musculoskeletal symptoms emphasizes that FM is more than just a pain disorder. Physicians managing these patients should be alert towards recognizing these FM-related symptoms.

**Keywords** Fibromyalgia; Korea; Characteristics

### Introduction

Fibromyalgia (FM) is a common condition afflicting 2% of the population [1]. It is characterized by chronic widespread pain with increased sensitivity to pressure elicited pain. The American College of Rheumatology [ACR] classification criteria in 1990 stipulated the presence of chronic widespread pain for at least 3 months and the presence of at least 11 out of 18 tender points [2]. Aside from pain, common problems of FM are morning stiffness, fatigue, nonrestorative sleep, pain, concentration, and memory [3].

Epidemiological studies report a FM prevalence of between 2 and 7% in most nations, with a female to male ratio of approximately 9:1 [3]. The prevalence of FM was 2.2% in Korean and was significantly higher in female and aged individuals [4]. It is increasingly evident that FM represents a significant challenge in view of its high prevalence,

frequent comorbidities, and frustration with current treatment modalities.

Although fibromyalgia (FM) has been known to present a variety of clinical symptoms, a detailed investigation on this topic has not been performed in Korean patients. We tried to identify various FM-related symptoms and compare the clinical features of patients with primary FM and those of patients with secondary FM.

### Materials and Methods

#### Study population

Total 336 patients with FM were consecutively recruited from outpatient rheumatic clinics of 10 medical centers participated in national survey on clinical characteristics of Korean patients with FM from June 2008 to March 2009 in Korea. All of them at the time of initial diagnosis met classification criteria for FM proposed by ACR in 1990

[2]. The protocol of this study was approved by Institutional Review Board at each medical center. Total participants gave informed consent for this research.

**Data collection**

Demographics of enrolled patients including age, gender, height, weight, symptom duration, disease duration after diagnosis, education, employment status, marital status, annual income and insurance were preliminary assessed. In addition, alcohol intake was identified such as current alcoholic and non-alcoholic at the time of enrollment in this study. Smoking status was also classified into current smoker and non-smoker. At the assessment of medical history, we surveyed accompanying diseases in the participants such as diabetes mellitus, hypertension, hepatitis, thyroid disease, affective disorder and other rheumatic disease.

At the assessment of symptoms and signs, we surveyed past and current symptoms and signs in the participants such as generalized weakness, unrefreshing sleep, fatigue, stiffness, paresthesia, swelling, febrile sense, tension headache, subjective cognitive dysfunction, dry eye, dry mouth, swollen glands, vasomotor rhinitis, dizziness and vestibular complaints, syncope and neutrally mediated hypotension, temporomandibular joint syndrome, non-cardiac chest pain, costochondritis, dyspnea, esophageal dysmotility, dyspepsia, irritable bowel syndrome, irritable bladder and female urethral syndrome, vulvodynia and vagismus, skin redness, restless leg syndrome and reflex sympathetic dystrophy. The glossary of symptom and sign is defined in Table 1.

Term	Description
Stiffness	Morning stiffness
Swelling	Feeling of swollen hands and feet
Cognitive dysfunction	Subjective memory and concentration difficulties
Dry eye	Positive response to at least one of 3 questions: Have you had daily, persistent, troublesome dry eyes for > 3 months? Do you have a recurrent sensation of sand or gravel in the eyes? Do you use tear substitutes > 3 times a day?
Dry mouth	Positive response to at least one of 2 questions? Have you had a daily feeling of dry mouth for > 3 months? Do you frequently drink liquids to aid in swallowing dry food?
Swollen glands	Recurrent or persistently swollen salivary gland as an adult
Vasomotor rhinitis	Rhinorrhea, nasal congestion, itching, and sneezing that is not attributable to allergy or infection and is thought to be a hypersensitive reaction to various potentially irritating stimuli (as strong odors, air pollution, or sudden temperature changes)
Temporomandibular joint syndrome	Pain, muscle tenderness, clicking in the joint, and limitation or alteration of mandibular movement
Costochondritis	Local pain and tenderness of costochondral junction (chest around the sternum)
Esophageal dysmotility	Subjective symptom of heartburn, not noted by barium or manometric studies
Irritable bowel syndrome	The Rome criteria
Irritable bladder, female urethral syndrome	Subjective symptom of urinary frequency, urgency, burning, and more with a lack of objective findings.
Restless leg syndrome	International Restless Legs Syndrome Study Group Diagnostic Criteria (1995)
Reflex sympathetic dystrophy/CRPS	International Association for the Study of Pain Diagnostic Criteria (1994)

**Table 1:** Glossary of signs and symptoms.

We also surveyed stressors capable of triggering FM in the participants such as peripheral pain syndrome, infection, physical trauma, psychological stress/distress, hormonal alteration, drugs, vaccines and catastrophic events. In addition, we surveyed current medications in the participants such as selective serotonin reuptake inhibitor (SSRI), serotonin norepinephrine reuptake inhibitor (SNRI), pregabalin, gabapentin, tricyclic antidepressant (TCA), muscle relaxant, nonsteroidal anti-inflammatory drugs (NSAID), tramadol, acetaminophen, sedative-hypnotics and benzodiazepine etc.

Identification of tender points was assessed through direct palpation at 18 specific sites with a force amount of 4.0 kg according to the standardized manual tender point survey [5]. First, the presence of a tender point at specific sites was identified. Second, the intensity of each tender point was graded as follows: 0, no tenderness; 1, light tenderness (confirming answer when asked); 2, moderate tenderness (spontaneous verbal response); and 3, severe tenderness (moving away). The summation of these points was regarded as the score of total tender points. The Korean version of the fibromyalgia impact

questionnaire (FIQ) was used to assess the functional abilities in patients with FMS on a scale of 0 to 100 for each subject [6]. Brief fatigue inventory (BFI) was used for the measure of fatigue severity in FMS patients [7]. The severity of depression was measured by brief depression inventory (BDI) [8,9]. The 36-item Medical Outcomes Study Short-Form Health Survey (SF-36) was evaluated for quality of life in FMS and consisted of eight items including physical health (physical functioning, role-physical, bodily pain, general health) and mental health (vitality, social functioning, role-emotional, mental health) [10]. The state-trait anxiety inventory (STAI)-1 and STAI-2 were developed as methods for evaluation of the degree of anxiety [11]. The state anxiety and trait anxiety were identified using these two methods. Self efficacy scale was assessed in our study [12]. Social family support and social friend support were also assessed in this study [13].

### Statistical analysis

Data were described as the mean ± standard deviation or number with percent (%) of cases. For the comparison of clinical characteristics between primary and secondary FM, Chi-square test was used for the comparison of categorical variables and Mann-Whitney U test was applied in the assessment of the differences of sequential variables. A p value <0.05 was considered statistically significant. Statistical analysis was performed using the Statistical Package for the Social Sciences, version 13.0 (SPSS Inc., Chicago, IL, USA).

## Results

### General characteristics of enrolled subjects

Generalized demographic and clinical characteristics are identified in Table 2. The majority (89.6%) of participants were women (n=301), and the average age was 47.9 years. On average, participants were diagnosed with FM approximately two years prior to recruitment and participation in this study. Mean duration of education was approximately 11.0 years, which was comparable with a high school degree. The study population having an occupation of physical labor was 32.9% (n=107). Current alcohol consumers were estimated at 22.0% (n=74) of the study population. The prevalence of accompanying affective disorders such as depression or anxiety was estimated as approximately 26.5%. Approximately 26.2% of the patients had underlying rheumatic diseases including Behcet's disease, osteoarthritis, rheumatoid arthritis, Sjögren syndrome, systemic lupus erythematosus, or other rheumatic disorders.

Characteristics	Values
Age (years)	47.9 ± 10.9
Sex (women)	301/336 (89.6)
Symptom duration (years)	8.3 ± 8.1
Disease duration (years)	2.0 ± 3.0
Education (years)	11.0 ± 4.0
Periods of education (years)	
0 – 6	54/280 (19.3)
7–9	54/280 (19.3)

10–12	99/280 (35.4)
>12	73/280 (26.1)
Annual income (US \$/year)	27,455.6 ± 26,792.7
Current smoking (n=336)	33/336 (9.8)
Female/Male (n, % of each gender)	22(7.3)/11 (31.4)
Current employment*(n = 325)	107/325 (32.9)
Marital status* (n=334)	
Single	30/334 (9.0)
Married	273/334 (81.7)
Divorced	18/334 (5.4)
Separated	4/334 (1.2)
Widowed	9/334 (2.7)
Current alcohol intake status	74/336 (22.0)
Non-current alcoholic	262/336 (78.0)
Current alcoholic	74/336 (22.0)
Diabetes mellitus	20/336 (6.0)
Hypertension	59/335 (17.6)
Hepatitis B or C	14/336 (4.2)
Thyroid disease	28/336 (8.3)
Affective disorders†	89/336 (26.5)
Rheumatic diseases‡	88/336 (26.2)
None	248/336 (73.8)
Behcet's disease	12/336 (3.6)
Osteoarthritis	32/336 (9.5)
Rheumatoid arthritis	26/336 (7.7)
Sjögren's syndrome	5/336 (1.5)
Systemic lupus erythematosus	9/336 (2.7)
Others (gout, spondyloarthropathy)	4/33.6 (1.2)

Data were described as mean ± standard deviation or number (Percentage of cases).

\*Some of all enrolled patients did not answer a part of queries required in this survey. †Affected disorders included depression and anxiety. ‡Rheumatic diseases included osteoarthritis, rheumatoid arthritis, Behcet's disease, Sjögren's syndrome, systemic lupus erythematosus, and other rheumatic diseases.

**Table 2:** Demographics, social and medical characteristics in enrolled patients (n=336).

### Current and past accompanying symptoms and signs

The following symptoms were exhibited by more than two-thirds of FM patients, in order of frequency: fatigue, unrefreshing sleep,

generalized weakness, stiffness, tension headache, swelling, febrile sense, and dizziness (Table 3).

	Past (%)	Current (%)	Total (%)
Fatigue	300/336 (89.3)	302/336 (89.9)	324/336 (96.4)
Unrefreshing sleep	286/336 (85.1)	282/336 (83.9)	312/336 (92.9)
Generalized weakness	279/336 (83.0)	273/336 (81.3)	303/336 (90.2)
Stiffness	258/336 (76.8)	267/336 (79.5)	289/336 (86.0)
Tension headache	244/336 (72.6)	215/336 (64.0)	271/336 (80.7)
Swelling	215/334 (64.4)	194/336 (57.7)	243/334 (72.8)
Febrile sense	189/335 (56.4)	203/335 (60.6)	234/335 (69.9)
Dizziness, vestibular complaints	207/336 (61.6)	183/335 (54.6)	234/335 (69.9)
Dry mouth	168/335 (50.1)	201/335 (60.0)	215/334 (64.4)
Subjective cognitive dysfunction	148/335 (44.2)	202/335 (60.3)	209/335 (62.4)
Dry eye	175/336 (52.1)	188/336 (56.0)	205/336 (61.0)
Dyspepsia	177/335 (52.8)	163/336 (48.5)	195/335 (58.2)
Paresthesia	159/334 (47.6)	168/333 (50.5)	184/333 (55.3)
Non-cardiac chest pain	142/336 (42.3)	120/334 (35.9)	165/334 (49.4)
Dyspnea	127/336 (37.8)	103/335 (30.7)	150/335 (44.8)
Restless leg syndrome	129/335 (38.5)	134/335 (40.0)	149/335 (44.5)
Irritable bladder, female urethral syndrome	128/334 (38.3)	121/332 (36.4)	146/332 (44.0)
Esophageal dysmotility	125/335 (37.3)	111/335 (33.1)	139/335 (41.5)
Irritable bowel syndrome	120/336 (35.7)	111/336 (33.0)	136/336 (40.5)
Temporomandibular joint syndrome	101/335 (30.1)	102/335 (30.4)	124/334 (37.1)
Skin redness	96/334 (28.7)	94/334 (28.1)	114/334 (34.1)
Vasomotor rhinitis	97/336 (28.9)	90/334 (26.9)	109/334 (32.6)
Costochondritis	90/335 (26.9)	85/336 (25.3)	104/335 (31.0)

Syncope, neurally mediated hypotension	79/336 (23.5)	35/334 (10.5)	87/334 (26.0)
Swollen glands	73/336 (21.7)	64/335 (19.0)	82/335 (24.5)
Vulvodynia, vagismus	55/300 (18.3)	40/300 (13.3)	63/300 (21.0)
Reflex sympathetic dystrophy	49/335 (14.6)	30/335 (9.0)	52/335 (15.5)

**Table 3:** Current and past accompanying symptoms and signs in the 336 patients with fibromyalgia.

### Stressors that triggered fibromyalgia symptoms

Stressors that triggered FM symptoms were found in 58.6% of the patients and can be listed in the following order: psychological distress, peripheral pain syndrome, catastrophic events, physical trauma, hormonal alteration, infections, and drugs (Table 4).

Variables	Number (%)
Psychological stress/distress (e.g., conflict with in-laws)	83/336 (24.7)
Peripheral pain syndrome (e.g., osteoarthritis)	64/336 (19.0)
Catastrophic events (e.g., childbirth)	21/336 (6.3)
Physical trauma (e.g., motor vehicle accident)	19/336 (5.7)
Hormonal alteration (e.g., menopause)	4/336 (1.2)
Infections	3/336 (0.9)
Drugs	3/336 (0.9)
Non-available	139/336 (41.4)

**Table 4:** Stressors that triggered fibromyalgia symptoms.

### Comparison of clinical characteristics between primary and secondary fibromyalgia

Compared to patients with primary FM, patients with secondary FM were significantly older, less educated, more Medical Aid beneficiaries, had more dizziness, received more NSAIDs and analgesics, and had higher levels of trait anxiety ( $p < 0.05$ ,  $p < 0.05$ ,  $p = 0.001$ ,  $p < 0.05$ ,  $p < 0.01$ ,  $p < 0.01$ , and  $p < 0.05$ , respectively) (Table 5).

	Primary (N=248)	Secondary (N=88)	P value
Age	47.4 (40.6, 53.4)	48.1 (43.5, 60.1)	0.038
Women (%)	223/248 (89.9)	78/88 (88.6)	0.690
Symptom duration, years	6.00 (3.00, 10.00)	5.00 (2.00, 10.00)	0.638
Disease duration, years	0.50 (0.08, 3.00)	1.00 (0.07, 3.00)	0.460
Education, years	12.00 (9.00, 14.00)	12.00 (6.00, 12.00)	0.017
Employment (%)	80/238 (33.6)	27/87 (31.0)	0.691
Marital status, married (%)	206/246 (83.7)	67/88 (76.1)	0.147
Insurance, insured/beneficiary	227/16	71/17	0.001

Alcohol, no/past/current	164/25/59	67/6/15	0.219
Smoking, never/ex-smoker/smoker	206/28/14	82/5/1	0.055
Diabetes mellitus (%)	15/248 (6.0)	5/88 (5.7)	1.000
Hypertension (%)	39/247 (15.8)	20/88 (22.7)	0.146
Hepatitis B or C (%)	11/248 (4.4)	3/88 (3.4)	1.000
Thyroid disease (%)	24/248 (9.7)	4/88 (4.5)	0.178
Affective disorder (%)	80/238 (33.6)	27/87 (31.0)	0.691
Clinical features (%)			
Fatigue	240/248 (96.8)	84/88 (95.5)	0.521
Unrefreshing sleep	230/248 (92.7)	82/88 (93.2)	1.000
Generalized weakness	225/248 (90.7)	78/88 (88.6)	0.539
Stiffness	212/248 (85.5)	77/88 (87.5)	0.723
Tension headache	204/248 (82.3)	67/88 (76.1)	0.213
Swelling	176/248 (71.0)	67/86 (77.9)	0.261
Febrile sense	172/248 (69.4)	62/87 (71.3)	0.787
Dizziness, vestibular complaints	165/247 (66.8)	69/88 (78.4)	0.043
Dry mouth	160/246 (65.0)	55/88 (62.5)	0.698
Subjective cognitive dysfunction	151/248 (60.9)	58/87 (66.7)	0.370
Dry eye	147/248 (59.3)	58/88 (65.9)	0.310
Dyspepsia	143/248 (57.7)	52/87 (59.8)	0.801
Paresthesia	132/246 (53.7)	52/87 (59.8)	0.380
Non-cardiac chest pain	126/247 (51.0)	39/87 (44.8)	0.383
Dyspnea	108/247 (43.7)	42/88 (47.7)	0.535
Restless leg syndrome	111/248 (44.8)	38/87 (43.7)	0.901
Irritable bladder, female urethral syndrome	105/244 (43.0)	41/88 (46.6)	0.617
Esophageal dysmotility	103/247 (41.7)	36/88 (40.9)	1.000
Irritable bowel syndrome	96/248 (38.7)	40/88 (45.5)	0.312
Temporomandibular joint syndrome	92/247 (37.2)	32/87 (36.8)	1.000
Skin redness	77/246 (31.3)	37/88 (42.0)	0.088
Vasomotor rhinitis	77/246 (31.3)	32/88 (36.4)	0.427
Costochondritis	75/247 (30.4)	29/88 (33.0)	0.688
Syncope, neurally mediated hypotension	60/246 (24.4)	27/88 (30.7)	0.260
Swollen glands	61/247 (24.7)	21/88 (23.9)	1.000
Vulvodynia, vagismus	41/222 (18.5)	22/78 (28.2)	0.077
Reflex sympathetic dystrophy	43/247 (17.4)	9/88 (10.2)	0.125
Medications (%)			

Selective serotonin reuptake inhibitor	70/241 (29.0)	24/87 (27.6)	0.890
Serotonin norepinephrine reuptake inhibitor	47/241 (19.5)	12/87 (13.8)	0.259
Pregabalin	54/241 (22.4)	16/87 (18.4)	0.542
Gabapentin	10/241 (4.1)	3/87 (3.4)	1.000
Tricyclic antidepressant	93/239 (38.9)	42/85 (49.4)	0.097
Muscle relaxant	63/241 (26.1)	21/87 (24.1)	0.776
Non-steroidal anti-inflammatory drugs	119/241 (49.4)	58/87 (66.7)	0.006
Tramadol	98/241 (40.7)	37/87 (42.5)	0.800
Acetaminophen	3/241 (1.2)	7/87 (8.0)	0.004
Sedative-hypnotics	34/241 (14.1)	17/87 (19.5)	0.232
Benzodiazepine	47/241 (19.5)	12/87 (13.8)	0.259
Tender point number	14.0 (12.0, 18.0)	14.0 (11.0, 18.0)	0.394
Tender point count	27.0 (16.3, 36.0)	26.0 (15.0, 33.8)	0.280
Fibromyalgia impact questionnaire	61.6 (48.8, 74.3)	59.1 (41.2, 71.7)	0.261
Brief fatigue inventory	6.3 (5.0, 7.9)	6.7 (4.6, 8.0)	0.684
SF-36			
Physical functioning	37.0 (29.7, 42.3)	34.9 (27.6, 42.3)	0.367
Role-Physical	34.8 (27.5, 42.2)	34.8 (27.5, 42.2)	0.834
Bodily pain	33.4 (29.2, 37.6)	33.4 (29.2, 41.4)	0.469
General health	29.3 (25.8, 35.3)	28.2 (23.4, 37.3)	0.853
Vitality	30.2 (24.0, 39.6)	33.4 (24.0, 42.7)	0.101
Social functioning	35.0 (29.6, 45.9)	37.8 (29.6, 45.9)	0.887
Role-Emotional	32.6 (20.9, 44.2)	32.6 (21.9, 44.2)	0.342
Mental health	33.1 (24.7, 41.6)	33.1 (24.7, 43.7)	0.750
Physical component summary	36.0 (31.0, 40.6)	35.9 (30.4, 41.0)	0.616
Mental component summary	33.4 (24.4, 41.6)	34.0 (27.3, 41.3)	0.425
Beck depression inventory	18.0 (11.0, 25.0)	18.0 (10.3, 27.0)	0.862
State-trait anxiety inventory I	48.0 (40.0, 57.0)	48.5 (41.8, 59.3)	0.491
State-trait anxiety inventory II	50.0 (42.5, 57.0)	54.0 (45.3, 61.8)	0.032
Self efficacy	740.0 (550.0, 930.0)	700.0 (520.0, 875.0)	0.234
Social support family	39.0 (34.0, 45.0)	37.5 (34.0, 43.0)	0.397
Social support friend	36.0 (34.0, 42.0)	36.0 (33.0, 43.0)	0.651

**Table 5:** Comparison of clinical characteristics between primary and secondary fibromyalgia.

### Comparison of clinical characteristics among patients with fibromyalgia in Korea and other countries

The frequencies of the various subjective symptoms in the present study and other Caucasian and Asian published series of FM patients

were shown in Table 6 and 7. Korean patients with FM had fewer symptoms related to cognitive dysfunction and vulvodynia than Western (especially, German) patients (Table 6). Korean patients with FM had more symptoms related to restless leg syndrome, temporomandibular joint syndrome and skin redness than Western

(especially, USA) patients (Table 6). Unrefreshing sleep, fatigue, stiffness, headache, and subjective swelling were more frequently found in Korean patients than in Caucasian and other Asian patients (Table 7).

	NFA cases (%)	DFV cases (%)	Korean cases (%)	P value (vs NFA)	P value (vs DFV)
Fatigue	1028/2569 (40.0)	689/695 (99.1)	324/336 (96.4)	<0.0001	0.0048
Unrefreshing sleep		679/692 (98.1)	312/336 (92.9)		0.0001
Generalized weakness		672/693 (97.0)	303/336 (90.2)		<0.0001
Stiffness		680/697 (97.6)	289/336(86.0)		<0.0001
Tension headache	1207/2569 (47.0)	634/693 (91.5)	271/336 (80.7)	<0.0001	<0.0001
Swelling		623/687 (90.7)	243/334 (72.8)		<0.0001
Febrile sense		559/685 (81.6)	234/335 (69.9)		<0.0001
Dizziness, vestibular complaints	1156/2569 (45.0)	642/695 (92.4)	234/335 (69.9)	<0.0001	<0.0001
Dry mouth		614/694 (88.5)	215/334 (64.4)		<0.0001
Subjective dysfunction, cognitive		667/691 (96.5)	209/335 (62.4)		<0.0001
Dry eye		575/685 (83.9)	205/336 (61.0)		<0.0001
Dyspepsia	1028/2569 (40.0)	505/689 (73.3)	195/335 (58.2)	<0.0001	<0.0001
Paresthesia	1130/2569 (44.0)	621/694 (89.5)	184/333 (55.3)	0.0001	<0.0001
Non-cardiac chest pain		544/689 (79.0)	165/334 (49.4)		<0.0001
Dyspnea			150/335 (44.8)		
Restless leg syndrome	822/2569 (32.0)		149/335 (44.5)	<0.0001	
Irritable bladder, female urethral syndrome	668/2569 (26.0)	457/689 (66.3)	146/332 (44.0)	<0.0001	<0.0001
Esophageal dysmotility			139/335 (41.5)		
Irritable bowel syndrome	1130/2569 (44.0)	485/680 (71.3)	136/336 (40.5)	0.2468	<0.0001
Temporomandibular joint syndrome	745/2569 (29.0)		124/334 (37.1)	0.0029	
Skin redness	642/2569 (25.0)		114/334 (34.1)	0.0005	
Vasomotor rhinitis	951/2569 (37.0)		109/334 (32.6)	0.1308	
Costochondritis			104/335 (31.0)		
Syncope, neurally mediated hypotension			87/334 (26.0)		
Swollen glands			82/335 (24.5)		
Vulvodynia		532/656 (81.1)	63/300 (21.0)		<0.0001
Reflex sympathetic dystrophy			52/335 (15.5)		
Lower back pain	1619/2569 (63.0)	692/695 (99.6)			
Arthritis	1182/2569 (46.0)				
Muscle spasm	1182/2569 (46.0)	458/683 (67.1)			
Tingling	1182/2569 (46.0)	621/694 (89.5)			

Tinnitus	771/2569 (30.0)	575/694 (82.9)			
Depression	1028/2569 (40.0)	596/690 (86.4)			
Anxiety	976/2569 (38.0)	606/696 (87.1)			
NFA: National Fibromyalgia Association; GFA: German Fibromyalgia Association					

**Table 6:** Comparison of FM symptoms in NFA and DFV cases with those in Korean cases.

	Caucasian cases (%)	Asian cases (%)	Korean cases (%)	P value (vs Caucasian)	P value (vs Asian)
Widespread pain	700/777 (90.1)	72/80 (90.0)	336/336 (100.0)	<0.0001	<0.0001
Unrefreshing sleep	625/879 (71.1)	54/80 (67.5)	312/336 (92.9)	<0.0001	<0.0001
Fatigue	684/777 (88.0)	69/80 (86.3)	324/336 (96.4)	<0.0001	0.0017
Stiffness	182/241 (75.5)	37/50 (74.0)	289/336 (86.0)	0.0031	0.0482
Anxiety	507/777 (65.3)	48/80 (60.0)			
Headache	513/879 (58.4)	49/80 (61.3)	271/336 (80.7)	<0.0001	0.0002
IBS	376/879 (42.8)	34/80 (42.5)	136/335 (40.5)	0.3777	0.7155
Subjective swelling	471/879 (53.6)	12/30 (40.0)	243/334 (72.8)	<0.0001	0.0003
Numbness, paresthesia	419/856 (48.9)	52/80 (65.0)	184/333 (55.3)	0.0729	0.1346
Mental stress	416/649 (64.1)	13/30 (43.3)			
Depression	251/649 (38.7)	11/30 (36.7)	89/335 (26.6)	0.0002	0.3379
Dysmenorrhea	45/113 (39.8)	15/30 (50.0)			
Raynaud-like sx	21/55 (38.2)	13/50 (26.0)			
Often feeling cold	43/55 (78.2)				
Nausea	25/55 (45.5)				
Vertigo	26/55 (47.3)		234/335 (69.9)	0.0014	
Subjective feeling of muscle tension	42/55 (76.4)				
Sicca sx		36/50 (72.0)	215/334 (64.4)		0.3434
Caucasian case: USA16-19, Sweden20, Denmark21 and Israel22; Asian case: Japan23 and Bangladesh24					

**Table 7:** Comparison of FM symptoms in Caucasian and Asian cases with those in Korean cases.

## Discussion

The results of this study are from 336 patients and from 10 medical centers all over the country. This is the first report of clinical characteristics of Korean patients with FM. Although chronic widespread pain was the dominant symptom, patients with FM also experienced multiple symptoms in addition to pain. The most commonly reported symptoms were fatigue, unrefreshing sleep, generalized weakness, stiffness, tension headache, swelling, febrile sense, and dizziness. The range of FM symptoms in the Korean population are similar to the Western population [3,14,15]. The economic impact of FM on employment was also notable, with current employment 32.9% which was corroborated by others (22~67%,

average 40%) [14]. It took an average of 2 years before receiving a diagnosis of FM. The diagnosis of FM is delayed. Patients wait a significant period of time before presenting to a physician, adding to the prolonged time to diagnosis. Helping clinicians to diagnose patients with FM should benefit both patients and funders of healthcare.

Commonly used medications for FM, as reported by the clinicians, were NSAID, TCA, tramadol, SSRI, and muscle relaxant in descending order of frequency. Pregabalin, SNRI, benzodiazepine, sedative-hypnotics, and gabapentin etc were used above this. Pregabalin prescription rate was relatively low because in that time (early phase of patients enrollment) there was no approval to prescription of pregabalin for FM by Korea Food and Drug Administration.



The frequencies of the various subjective symptoms in the present study and other Caucasian and Asian published series of FM patients [16-25] seem fairly identical as shown in Table 6 and 7. However, the frequencies of the various subjective symptoms in USA (National Fibromyalgia Association, NFA) study [3] were much less than ours (Table 6). The surveyed NFA population was self-selected as people with FM who had Internet access and was familiar with the NFA website. Approximately 70% of the respondents mentioned that they obtained information about FM from the website. It is possible that those familiar with NFA differ in important ways from people with FM in general. They were not personally interviewed or formally diagnosed. Thus an unknown proportion of those responding may not have met 1990 ACR classification criteria for a diagnosis of FM [2]. In addition, only some 60 percent of them took medications, which suggest they had less severe symptoms than our patients. Our all patients, on the other hand, met 1990 ACR classification criteria for a diagnosis of FM [2], which means their symptoms were severe and frequently appeared.

Furthermore, the frequencies of the various symptoms in German (German Fibromyalgia Association, GFA) study [25] were much more than ours (Table 6). The terminology of symptoms in GFA study is more of an ordinary person's expression than a medical term. In addition, that terminology was not defined in that study. On the other hand, the symptoms and sign were defined by glossary before study enrollment and patients were personally interviewed in our study. It might be the reason why the frequencies of the symptoms in GFA study were different from ours.

The other Caucasian studies were tried in USA (16-19), Sweden (20), Denmark [21] and Israel [22] etc. Asian studies were tried in Japan [23] and Bangladesh [24]. Variation of the prevalence of the each symptom may depend on different classification criteria, different definitions of the symptoms and sign, actual patient differences or various biases in the studies. In particular, a large variation is seen for the percentage of patients complaining of unrefreshing sleep, fatigue, stiffness, headache, and subjective swelling, with the highest frequencies obtained in this study (Table 7). The frequencies of the various subjective symptoms in our study and German study were much more than USA (Table 6). That is the most likely explanation why pregabalin and SNRI (e.g., milnacipran) were not usual prescription for FM in 2 countries on that time (from 2007 till 2008).

Several limitations of this study should be considered. First, although the study was open to women and men, the majority of people enrolled in the study were women. Although the majority of people diagnosed with FM are women, future studies should include men in order to assess any variance in symptoms experienced by men or any differences in the way that FM impacts the lives of men. Second, patients were recruited by the investigators and were required to be able to participate in this study and therefore may not be representative of all Korean patients with FM. Finally, while the size of the groups allowed for an intensive survey and tender point examination, confirmatory information with a larger population of patients is needed. However, the strengths of this study may be summarized as follows. First, the symptoms and sign were defined by glossary before study enrollment. Similar studies of clinical feature used the terminology on symptoms and sign without definite glossary. Second is a comparison between Korea and other countries. Several differences were found between the Korean and the other countries patients with FM in the clinical features. Further study will be needed to clarify whether these differences arise from racial factor(s).

We found that the range of FM symptoms in the Korean population are similar to the Western population. A comprehensive assessment of the multiple symptoms domains associated with FM and the impact of FM on multidimensional aspects of function should be a routine part of the care of FM patients.

## References

1. Wolfe F, Ross K, Anderson J, Russell IJ, Hebert L (1995) The prevalence and characteristics of fibromyalgia in the general population. *Arthritis Rheum* 38: 19-28.
2. Wolfe F, Smythe HA, Yunus MB, Bennett RM, Bombardier C, et al. (1990) The American College of Rheumatology 1990 Criteria for the Classification of Fibromyalgia. Report of the Multicenter Criteria Committee. *Arthritis Rheum* 33: 160-172.
3. Bennett RM, Jones J, Turk DC, Russell IJ, Matallana L (2007) An internet survey of 2,596 people with fibromyalgia. *Musculoskelet Disord* 8: 27.
4. Kim SH, Bae GR, Lim HS (2006) Prevalence and risk factors of fibromyalgia syndrome and chronic widespread pain in two communities in Korea - first report in Korean. *J Korean Rheum Assoc* 13: 18-25.
5. Okifuji A, Turk DC, Sinclair JD, Starz TW, Marcus DA (1997) A standardized manual tender point survey. I. Development and determination of a threshold point for the identification of positive tender points in fibromyalgia syndrome. *J Rheumatol* 24: 377-383.
6. Kim YA, Lee SS, Park K (2002) Validation of a Korean version of the Fibromyalgia Impact Questionnaire. *J Korean Med Sci* 17: 220-224.
7. Yun YH, Wang XS, Lee JS, Roh JW, Lee CG, et al. (2005) Validation study of the Korean version of the brief fatigue inventory. *J Pain Symptom Manage* 29: 165-172.
8. Rhee MK, Lee YH, Park SH, Son CH, Jeong YJ, et al. (1995) A standardization study of Beck Depression Inventory I - Korean version (K-BDI): Reliability and factor analysis. *Kor J Psychopathol* 4: 77-95.
9. Rhee MK, Lee YH, Jung HY, Choi JH, Kim SH, et al. (1995) A standardization study of Beck Depression Inventory II - Korean version (K-BDI) Validity. *Kor J Psychopathol* 4: 96-104.
10. Han CW, Lee EJ, Iwaya T, Kataoka H, Kohzuki M (2004) Development of the Korean version of Short-Form 36-Item Health Survey: health related QOL of healthy elderly people and elderly patients in Korea. *Tohoku J Exp Med* 203: 189-194.
11. Kim JT, Shin DG (1978) A study based on the standardization of the STAI for Korea. *The New Medical Journal* 21: 69-75.
12. Lee EO, Han SS (1997) Modification and test of self-help program for patients having fibromyalgia-pilot study. *The J of Rheumatology Health* 4: 262-276.
13. Soh IA, Kwon YS, Park CJ (1999) Study in relation to social support, compliance and psychosocial adjustment of rheumatoid arthritic patient. *The J of Rheumatology Health* 6: 211-225.
14. Arnold LM, Crofford LJ, Mease PJ, Burgess SM, Palmer SC, et al. (2008) Patient perspectives on the impact of fibromyalgia. *Educ Couns* 73: 114-120.
15. Mease P, Arnold LM, Bennett R, Boonen A, Buskila D, et al. (2007) Fibromyalgia syndrome. *J Rheumatol* 34: 1415-1425.
16. Yunus M, Masi AT, Calabro JJ, Miller KA, Feigenbaum SL (1981) Primary fibromyalgia (fibrositis): clinical study of 50 patients with matched normal controls. *Semin Arthritis Rheum* 11: 151-171.
17. Yunus MB, Masi AT, Aldag JC (1989) A controlled study of primary fibromyalgia syndrome: clinical features and association with other functional syndromes. *J Rheumatol* 19: 62-71.
18. Yunus MB, Inanici F, Aldag JC, Mangold RF (2000) Fibromyalgia in men: comparison of clinical features with women. *J Rheumatol* 27: 485-490.
19. Weir PT, Harlan GA, Nkoy FL, Jones SS, Hegmann KT, et al. (2006) 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* 12: 124-128.

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20. Bengtsson A, Henriksson KG, Jorfeldt L, Kägedal B, Lennmarken C, et al. (1986) Primary fibromyalgia. A clinical and laboratory study of 55 patients. *Scand J Rheumatol* 15: 340-347.
  21. Jacobsen S, Petersen IS, Dannekiold-Samsøe B (1993) Clinical features in patients with chronic muscle pain--with special reference to fibromyalgia. *Scand J Rheumatol* 22: 69-76.
  22. Peleg R, Ablin JN, Peleg A, Neumann L, Rabia RA, et al. (2008) Characteristics of fibromyalgia in Muslim Bedouin women in a primary care clinic. *Semin Arthritis Rheum* 37: 398-402.
  23. Nishikai M (1992) Fibromyalgia in Japanese. *J Rheumatol* 19: 110-114.
  24. Choudhury AK, Yunus MB, Haq SA, Alam MN, Sebrina F, et al. (2001) Clinical features of fibromyalgia syndrome in a Bangladeshi population. *J Musculoskeletal Pain* 9: 25-33.
  25. Häuser W, Zimmer C, Felde E, Köllner V (2008) [What are the key symptoms of fibromyalgia? Results of a survey of the German Fibromyalgia Association. *Schmerz* 22: 176-183.