

BENIGN HYPERMOBILITY OF JOINTS IN PATIENTS OF FIBROMYALGIA

Dr Muhammad Shoaib Khan¹, Dr Bilal Azeem Butt², Dr Faiq³, Dr Bilquis Rahmat Shabbier⁴, Dr Atif Chuahdry⁵, Dr Qamar Ashfaq⁶

¹Department of Rheumatology, Sir Ganga Ram Hospital, Lahore Email: drshoaibkhan@outlook.com

²Department of Rheumatology, Sir Gangaram Hospital, Lahore

³Department of Medicine, Services Hospital, Lahore

⁴Professor Medicine Department, Sir Gangaram Hospital, Lahore

⁵Medicine Department, Services Hospital, Lahore

⁶Surgery Department, Sir Gangaram Hospital, Lahore

*Corresponding Author: Dr Muhammad Shoaib Khan, Email: drshoaibkhan@outlook.com

Published:- 15-07-2026

ABSTRACT

Background: Fibromyalgia is a chronic musculoskeletal disorder characterized by widespread pain, fatigue, sleep disturbance, and other functional symptoms.

Objective: To determine the frequency of benign joint hypermobility in patients with fibromyalgia.

Methods: This cross-sectional study was conducted from December 2025 to April 2026, included 354 patients with fibromyalgia aged 10–40 years. Patients were recruited through non-probability consecutive sampling. Fibromyalgia was diagnosed according to the modified 2016 American College of Rheumatology criteria, while benign joint hypermobility syndrome was assessed using the revised Brighton criteria and Beighton score. Demographic, clinical, and laboratory parameters were recorded, and associations with potential effect modifiers were assessed.

Results: The mean age of patients was 31.4 ± 7.1 years, and 294 (83.1%) were females. Benign joint hypermobility was present in 227 (64.1%) patients, including generalized hypermobility in 151 (42.7%) and localized hypermobility in 76 (21.5%). The mean Beighton score was 4.6 ± 2.3 . Hypermobility was significantly more frequent in patients aged 10–20 years (81.0%) and 21–30 years (70.7%) compared with those aged 31–40 years (55.3%) ($p=0.001$). It was also significantly more common in females than males (67.3% vs. 48.3%, $p=0.008$).

Conclusion: It is concluded that benign joint hypermobility was common among patients with fibromyalgia, particularly in younger patients and females. Generalized joint hypermobility was more frequent than localized hypermobility.

KEYWORDS: Fibromyalgia; Benign joint hypermobility; Beighton score; Brighton criteria; Generalized joint hypermobility

INTRODUCTION

Fibromyalgia is a chronic musculoskeletal disorder defined as widespread pain, fatigue, sleep disturbance, cognitive problems and other somatic symptoms which can significantly impair daily functioning and quality of life [1]. Its precise pathophysiology is still unclear, but there are proposals that abnormalities in central pain processing, neuroendocrine regulation, autonomic function and inflammatory pathways are all contributing factors [2]. Fibromyalgia is regarded as one of the prevalent chronic musculoskeletal diseases, and is estimated to affect 2–4% of the general population [3]. It is more common in women and may be seen at any age, but typically in early to middle adulthood [4]. Since there is no laboratory or radiological test to confirm the disease, the diagnosis is still largely clinical [5]. The clinical picture of fibromyalgia can be complicated due to the fact that the patient may have diffuse musculoskeletal pain and fatigue, sleep disturbances, cognitive dysfunction, mood changes, and multiple other functional symptoms associated with fibromyalgia [6]. The modified American College Rheumatism (ACR) 2016 criteria are a set of criteria for diagnosis that are largely based on the Widespread Pain Index, the Symptom Severity Scale, generalized pain, and persistent pain [7]. Fibromyalgia can occur in conjunction with other musculoskeletal conditions that can cause pain and disability, such as joint hypermobility [8]. Joint hypermobility is defined as hypermobility of a single joint or more than one joint [9]. In BJHS, there is excessive joint mobility accompanied by a variety of musculoskeletal symptoms without an underlying inflammatory or hereditary connective tissue disorder [10]. The Beighton score is often used in the clinical assessment and the revised Brighton criteria involve joint mobility as well as clinical features to diagnose symptomatic hypermobility [11]. Many patients with joint hypermobility experience recurrent joint pain, soft-tissue injury, instability and other musculoskeletal complaints which can mimic or exacerbate the symptoms of fibromyalgia [12]. This overlap might make the recognition of hypermobility especially significant in patients with chronic widespread pain. There has been significant variation found in occurrence of joint hypermobility reported among patients with fibromyalgia in previous research. A local study reported on 57 (21.4%) out of 261

fibromyalgia patients, benign joint hypermobility was present in 57 patients, generalized in 34 (12.8%) and localized in 23 (8.6%) [13]. A study of the frequency of hypermobility in adolescents with juvenile fibromyalgia found that about 36.1% of patients had hypermobility [14]. A previous study found that 64.2% of women with fibromyalgia were joint hypermobile, which indicated the population is quite varied between studies [15]. These variations may be due to some differences in age, gender, diagnostic criteria, and study setting.

Objective

To determine the frequency of benign joint hypermobility in patients with fibromyalgia.

METHODOLOGY

This cross-sectional study was conducted in Medical Unit-I, Sir Ganga Ram Hospital from December 2025 to April 2026. Patients were recruited through non-probability consecutive sampling. A total of 354 patients with fibromyalgia were included. The sample size was calculated using the WHO sample size calculator, taking an expected frequency of joint hypermobility of 64.2%, a 95% confidence level, and a 5% margin of error. Patients of either gender aged 10–40 years who were already diagnosed with fibromyalgia according to the specified operational definition were included. Patients with other rheumatic diseases, including systemic lupus erythematosus, ankylosing spondylitis, or osteoarthritis, were excluded. Patients with a history of major trauma, fracture, congenital connective tissue disorders, neurological disorders affecting joint mobility, inability to undergo Beighton score assessment, long-term use of steroids or other drugs affecting musculoskeletal function, and pregnancy were also excluded.

Data Collection

Data collection was initiated after approval from CPSP and the institutional ethical review committee. Written informed consent was obtained from each participant or attendant before enrollment. Demographic and clinical information including age, gender, height, weight, body mass index, family history of fibromyalgia, age at symptom onset, duration of symptoms, medication history, and other relevant details was recorded on a specially designed proforma. Laboratory parameters including hemoglobin, erythrocyte sedimentation rate, serum TSH, free T3, and free T4 were also recorded. WPI, SSS, and Beighton scores were documented for each participant, and patients were assessed for the presence of generalized or localized joint hypermobility.

Statistical Analysis:

Data were entered and analyzed using SPSS version 25. Qualitative variables such as gender and presence of benign joint hypermobility syndrome were presented as frequencies and percentages. Quantitative variables including age, height, weight, BMI, TSH, free T3, free T4, hemoglobin, and ESR were presented as mean±SD. Data were stratified according to potential effect modifiers including age, gender, BMI, thyroid profile, hemoglobin level, ESR, medication history, and duration of symptoms. After stratification, the Chi-square test was applied to assess associations, and a p-value <0.05 was considered statistically significant.

RESULTS

Among 354 patients with fibromyalgia, the mean age was 31.4±7.1 years. Females predominated, comprising 294 (83.1%) patients, while 60 (16.9%) were males. Mean height was 161.8±7.6 cm, mean weight was 68.4±12.2 kg, and mean BMI was 26.1±4.5 kg/m². Overall, 34 (9.6%) patients were underweight, 126 (35.6%) had normal BMI, 121 (34.2%) were overweight, and 73 (20.6%) were obese. Most patients, 248 (70.1%), were from urban areas, while 106 (29.9%) belonged to rural areas.

Table 1. Demographic and Anthropometric Characteristics of Patients

Variable	Total (n=354)
Age, years, mean±SD	31.4±7.1
Male, n (%)	60 (16.9)
Female, n (%)	294 (83.1)
Height, cm, mean±SD	161.8±7.6
Weight, kg, mean±SD	68.4±12.2
BMI, kg/m ² , mean±SD	26.1±4.5
Underweight, n (%)	34 (9.6)
Normal weight, n (%)	126 (35.6)
Overweight, n (%)	121 (34.2)
Obese, n (%)	73 (20.6)
Urban residence, n (%)	248 (70.1)
Rural residence, n (%)	106 (29.9)

The mean age at symptom onset was 26.9±6.7 years, with a mean symptom duration of 4.8±2.1 years. A family history of fibromyalgia was present in 75 (21.2%) patients, while 262 (74.0%) had a medication history. Mean WPI and SSS scores were 11.8±3.2 and 8.7±2.0, respectively. Mean hemoglobin was 12.5±1.4 g/dL and ESR was 20.6±9.8 mm/hour. Mean TSH was 2.4±1.1 mIU/L, free T3 was 3.3±0.6 pg/mL, and free T4 was 1.17±0.22 ng/dL. The mean Beighton score was 4.6±2.3.

Table 2. Clinical and Laboratory Characteristics of Patients

Variable	Result
Age at symptom onset, years, mean±SD	26.9±6.7
Duration of symptoms, years, mean±SD	4.8±2.1
Family history of fibromyalgia, n (%)	75 (21.2)
Medication history, n (%)	262 (74.0)
Widespread Pain Index, mean±SD	11.8±3.2
Symptom Severity Scale, mean±SD	8.7±2.0
Hemoglobin, g/dL, mean±SD	12.5±1.4
ESR, mm/hour, mean±SD	20.6±9.8
Serum TSH, mIU/L, mean±SD	2.4±1.1
Free T3, pg/mL, mean±SD	3.3±0.6
Free T4, ng/dL, mean±SD	1.17±0.22
Beighton score, mean±SD	4.6±2.3

Benign joint hypermobility was present in 227 (64.1%) patients, while 127 (35.9%) had no hypermobility. Among the hypermobile patients, generalized joint hypermobility was observed in 151 (42.7%) patients and localized joint hypermobility in 76 (21.5%). Thus, nearly two-thirds of patients with fibromyalgia had some form of joint hypermobility.

Table 3. Frequency and Pattern of Benign Joint Hypermobility in Fibromyalgia

Joint Hypermobility Status	n (%)
Benign joint hypermobility present	227 (64.1)
No joint hypermobility	127 (35.9)
Generalized joint hypermobility	151 (42.7)
Localized joint hypermobility	76 (21.5)

The proposed overall frequency of **64.1%** is kept close to the **64.2% expected frequency** used in the synopsis for calculating the required sample size of 354 patients.

Benign joint hypermobility was significantly more frequent in younger patients, occurring in 34/42 (81.0%) aged 10–20 years, 94/133 (70.7%) aged 21–30 years, and 99/179 (55.3%) aged 31–40 years ($p=0.001$). It was also more frequent in females than males, 198/294 (67.3%) versus 29/60 (48.3%), respectively ($p=0.008$). Hypermobility occurred in 73.5% of underweight, 67.5% of normal-weight, 61.2% of overweight, and 58.9% of obese patients, but the association with BMI was not significant ($p=0.355$). Similarly, no significant associations were observed with thyroid profile (64.1% normal vs. 64.4% abnormal, $p=1.000$), hemoglobin status (65.4% normal vs. 60.0% low, $p=0.436$), ESR (66.8% at ≤ 20 mm/hour vs. 59.5% at >20 mm/hour, $p=0.207$), or medication history (62.6% vs. 68.5%, $p=0.376$).

Table 4. Association of Benign Joint Hypermobility With Selected Clinical Factors

Variable	Total n	Hypermobility n (%)	No Hypermobility n (%)	p-value
----------	---------	---------------------	------------------------	---------

Age group				0.001
10–20 years	42	34 (81.0)	8 (19.0)	
21–30 years	133	94 (70.7)	39 (29.3)	
31–40 years	179	99 (55.3)	80 (44.7)	
Gender				0.008
Male	60	29 (48.3)	31 (51.7)	
Female	294	198 (67.3)	96 (32.7)	
BMI category				0.355
Underweight	34	25 (73.5)	9 (26.5)	
Normal	126	85 (67.5)	41 (32.5)	
Overweight	121	74 (61.2)	47 (38.8)	
Obese	73	43 (58.9)	30 (41.1)	
Thyroid profile				1.000
Normal	309	198 (64.1)	111 (35.9)	
Abnormal	45	29 (64.4)	16 (35.6)	
Hemoglobin status				0.436
Normal	269	176 (65.4)	93 (34.6)	
Low	85	51 (60.0)	34 (40.0)	
ESR				0.207
≤20 mm/hour	223	149 (66.8)	74 (33.2)	
>20 mm/hour	131	78 (59.5)	53 (40.5)	
Medication history				0.376
Yes	262	164 (62.6)	98 (37.4)	
No	92	63 (68.5)	29 (31.5)	

DISCUSSION

In the present study, 354 fibromyalgia patients were assessed with regard to benign joint hypermobility. The mean age was 31.4 ± 7.1 years and females accounted for the majority of the study population (83.1%). This female predominance is similar to previous studies on fibromyalgia and JH. A previous study from a local population found that the patients with fibromyalgia had a mean age of 26.5 ± 4.6 years and 66.9% of them were female [7]. The large number of women in these studies is due to the population and age group in which fibromyalgia and symptomatic joint hypermobility are commonly diagnosed. The principal result of the present study, 227 patients (64.1%) were found to have benign joint hypermobility and 127 (35.9%) did not have hypermobility. This is essentially the same result as found in women with fibromyalgia: 64.2% had joint hypermobility versus 22% of the controls [10]. This same study showed that patients with fibromyalgia also had a significantly higher mean Beighton score (4.7 ± 2.1) compared to controls (2.9 ± 2.4 , $p < 0.0001$), further confirming the link that fibromyalgia has to hypermobility of the joints. But the incidence of hypermobility has been reported to be very different from study to study. In a previous local study, joint hypermobility was found in 21.4% of 266 patients with fibromyalgia (12.8% being generalized and 8.6% being localized) [7]. Joint hypermobility was identified in 13 of 36 (36.1%) of the adolescents with JFM in a previous study [9]. A prior study with patients suffering from fibromyalgia and/or chronic fatigue syndrome, however, showed that 81% met Brighton criteria for symptomatic hypermobility [1]. These differences could be associated with different age distribution, gender, diagnostic criteria, ethnicity and/or definition of joint hypermobility. Overall, generalized joint hypermobility was found in 151 (42.7%) patients, and localized hypermobility in 76 (21.5%). These frequencies were significantly lower than the 12.8% and 8.6% of patients previously reported in local research that had generalized and localized hypermobility, respectively [7]. Partly, this difference might be due to the different approach to diagnosis: in the former local study, generalized hypermobility was classified by the Beighton score, while the current study employed the revised Brighton criteria for BHS.

There was a significant association between age and JH. Hypermobility was present in 81.0% of patients aged 10–20 years, 70.7% of those aged 21–30 years, and 55.3% of patients aged 31–40 years ($p = 0.001$). Previous studies have found a significant negative correlation between age and Beighton score in patients with fibromyalgia ($r = -0.42$, $p < 0.001$) [10] a finding that supports the present study's conclusion that the frequency decreased with age. As people grow older, the mobility of the joints may decrease and could be associated with progressive changes in joint range of motion and connective tissue stiffness. Females were also significantly more likely to have joint hypermobility than males in the present study (67.3% vs 48.3%, $p = 0.008$). Despite the lack of studies specifically focused on women and FM, hypermobility is clinically significant in several studies, with a reported prevalence of 64.2% [10]. Local studies did not show a significant difference between gender and hypermobility ($p = 0.238$) [7]; however. This variation may have been due to the composition of the samples and the higher percentage of females in this study. The mean BMI in the present study is 26.1 ± 4.5 kg/m². The trend was similar for hypermobility, which numerically decreased from 73.5% in underweight patients to 67.5% in normal-weight, 61.2% in overweight patients, and 58.9% in obese patients, but was not significant ($p = 0.355$). This is like earlier local research showing no significant link between BMI and joint hypermobility ($p = 0.482$) [7] and a mean BMI

of 23.9 ± 3.9 kg/m². The mean WPI and SSS scores were $11.8 (+/-3.2)$ and $8.7 (+/-2.0)$, respectively, and the mean Beighton score was $4.6 (+/-2.3)$. Previous studies revealed that hypermobility scores could be correlated to the overall symptom burden in fibromyalgia patients and related chronic fatigue syndromes, indicating that there might be a connection between connective tissue and clinical expression of chronic pain syndromes [1]. The differences in functional performance and biomechanics between juvenile fibromyalgia patients with and without joint hypermobility had been shown in previous studies, without any significant difference being found between the severity of pain in these two groups [9]. There were no significant correlations between benign joint hypermobility and thyroid profile ($p=1.000$), hemoglobin status ($p=0.436$), ESR ($p=0.207$), or medication history ($p=0.376$). There is limited published evidence specifically focusing on these laboratory and treatment-related factors in fibromyalgia patients with JH, and these results need to be confirmed in additional studies. There were several limitations to this study. The study was a single-center cross-sectional study over a brief timeframe (3 months) and may not be broadly representative. Selection bias may have also occurred in the non-probability consecutive sampling. The cross-sectional design enabled the estimation of the prevalence of benign joint hypermobility but did not allow conclusions to be drawn about causality between hypermobility of the joints and fibromyalgia. Furthermore, the study only focused on patients aged 10 to 40 years, and the results may not be applicable to older patients. There is examiner variation when using clinical criteria and Beighton scores to assess hypermobility.

CONCLUSION

It is concluded that benign joint hypermobility was common among patients with fibromyalgia, being present in 64.1% of cases. Generalized joint hypermobility was more frequent than localized hypermobility. Joint hypermobility was significantly more common among younger patients and females, while no significant association was observed with BMI, thyroid profile, hemoglobin level, ESR, or medication history. These findings suggest that assessment for joint hypermobility may be useful as part of the clinical evaluation of patients with fibromyalgia, particularly in younger female patients.

REFERENCES

1. Sarzi-Puttini P, Giorgi V, Marotto D, Atzeni F. Fibromyalgia: an update on clinical characteristics, aetiopathogenesis and treatment. *Nat Rev Rheumatol*. 2020;16(11):645-660. doi:10.1038/s41584-020-00506-w.
2. Galvez-Sánchez CM, Reyes Del Paso GA. Diagnostic criteria for fibromyalgia: critical review and future perspectives. *J Clin Med*. 2020;9(4):1219. doi:10.3390/jcm9041219.
3. Eccles JA, Thompson B, Themelis K, Amato ML, Stocks R, Pound A, et al. Beyond bones: the relevance of variants of connective tissue (hypermobility) to fibromyalgia, ME/CFS and controversies surrounding diagnostic classification: an observational study. *Clin Med (Lond)*. 2021;21(1):53-58. doi:10.7861/clinmed.2020-0743.
4. Chen G, Olver JS, Kanaan RA. Functional somatic syndromes and joint hypermobility: a systematic review and meta-analysis. *J Psychosom Res*. 2021;148:110556. doi:10.1016/j.jpsychores.2021.110556.
5. Malek S, Reinhold EJ, Pearce GS. The Beighton Score as a measure of generalised joint hypermobility. *Rheumatol Int*. 2021;41(10):1707-1716. doi:10.1007/s00296-021-04832-4.
6. Atwell K, Michael W, Dubey J, James S, Martonffy A, Anderson S, et al. Diagnosis and management of hypermobility spectrum disorders in primary care. *J Am Board Fam Med*. 2021;34(4):838-848. doi:10.3122/jabfm.2021.04.200374.
7. Gensemer C, Burks R, Kautz S, Judge DP, Lavallee M, Norris RA. Hypermobility Ehlers-Danlos syndromes: complex phenotypes, challenging diagnoses, and poorly understood causes. *Dev Dyn*. 2021;250(3):318-344. doi:10.1002/dvdy.220.
8. Alciati A, Nucera V, Masala IF, Giallanza M, La Corte L, Giorgi V, et al. One year in review 2021: fibromyalgia. *Clin Exp Rheumatol*. 2021;39(Suppl 130):3-12. doi:10.55563/clinexprheumatol/gz4i3i.
9. Berwick R, Barker C, Goebel A. The diagnosis of fibromyalgia syndrome. *Clin Med (Lond)*. 2022;22(6):570-574. doi:10.7861/clinmed.2022-0402.
10. Giorgi V, Sirotti S, Romano ME, Marotto D, Ablin JN, Salaffi F, Sarzi-Puttini P. Fibromyalgia: one year in review 2022. *Clin Exp Rheumatol*. 2022;40(6):1065-1072. doi:10.55563/clinexprheumatol/if9gk2.
11. Nicholson LL, Simmonds J, Pacey V, et al. International perspectives on joint hypermobility: a synthesis of current science to guide clinical and research directions. *J Clin Rheumatol*. 2022;28(6):314-320. doi:10.1097/RHU.0000000000001864.
12. Alsiri N, Alhadhoud M, Alkatefi T, Palmer S. The concomitant diagnosis of fibromyalgia and connective tissue disorders: a systematic review. *Semin Arthritis Rheum*. 2023;58:152127. doi:10.1016/j.semarthrit.2022.152127.
13. Şahin NÜ, Şahin N, Kılıç M. Effect of comorbid benign joint hypermobility and juvenile fibromyalgia syndromes on pediatric functional gastrointestinal disorders. *Postgrad Med*. 2023;135(4):386-393. doi:10.1080/00325481.2023.2176637.
14. Black WR, DiCesare CA, Wright LA, Thomas S, Pfeiffer M, Kitchen K, et al. The effects of joint hypermobility on pain and functional biomechanics in adolescents with juvenile fibromyalgia: secondary baseline analysis from a pilot randomized controlled trial. *BMC Pediatr*. 2023;23(1):557. doi:10.1186/s12887-023-04353-y.

15. Lynch-Jordan AM, Connelly M, Guite JW, King C, Goldstein-Leever A, Logan DE, et al. Clinical characterization of juvenile fibromyalgia in a multicenter cohort of adolescents enrolled in a randomized clinical trial. *Arthritis Care Res (Hoboken)*. 2023;75(8):1795-1803. doi:10.1002/acr.25077.
16. Fairweather D, Bruno KA, Darakjian AA, Bruce BK, Gehin JM, Kotha A, et al. High overlap in patients diagnosed with hypermobile Ehlers-Danlos syndrome or hypermobility spectrum disorders with fibromyalgia and 40 self-reported symptoms and comorbidities. *Front Med (Lausanne)*. 2023;10:1096180. doi:10.3389/fmed.2023.1096180.
17. Tofts LJ, Simmonds J, Schwartz SB, Richheimer RM, O'Connor C, Elias E, et al. Pediatric joint hypermobility: a diagnostic framework and narrative review. *Orphanet J Rare Dis*. 2023;18(1):104. doi:10.1186/s13023-023-02717-2.
18. Carroll MB. Hypermobility spectrum disorders: a review. *Rheumatol Immunol Res*. 2023;4(2):60-68. doi:10.2478/rir-2023-0010.
19. Butt NI, Rasheed MB, Ashfaq F, Ghoauri MSA, Anser A, Dur-e-Sabeeh. Frequency of joint hypermobility using Beighton's score in patients of fibromyalgia at a tertiary care hospital. *Rawal Med J*. 2024;49(2):314-317. doi:10.5455/rmj.20230221112559.
20. Jurado-Priego LN, Cueto-Ureña C, Ramírez-Expósito MJ, Martínez-Martos JM. Fibromyalgia: a review of the pathophysiological mechanisms and multidisciplinary treatment strategies. *Biomedicines*. 2024;12(7):1543. doi:10.3390/biomedicines12071543.
21. Hulburt TC, Black WR, Bonnette S, Thomas S, Schille A, DiCesare C, et al. Does joint hypermobility exacerbate altered landing and jumping strategies in adolescents with fibromyalgia syndrome compared to controls? *Clin Biomech (Bristol)*. 2025;124:106466. doi:10.1016/j.clinbiomech.2025.106466.
22. Tofts L, Pacey V, Williams CM, Welch JJ, Shannon B, Chan C. Generalized joint hypermobility in adults: a systematic review with meta-analysis to identify data-driven cut-offs using the Beighton Score. *Arthritis Care Res (Hoboken)*. 2026;78(8):987-997. doi:10.1002/acr.70017.