Associations between illness perception, treatment adherence and functional impact in fibromyalgia: a cross-sectional study

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Abstract

Objective

This study aimed to evaluate treatment adherence in patients with fibromyalgia (FM) and to examine its relationship with illness perception and disease severity.

Methods

A cross-sectional study was conducted on 84 FM patients. Treatment adherence, illness perception and fibromyalgia-related impact were assessed using the 8-item Morisky Medication Adherence Scale (MMAS), Brief Illness Perception Questionnaire (BIPQ), and Fibromyalgia Impact Questionnaire (FIQ), respectively.

Results

The majority of participants were female (79.8%) with a mean age of 43.7±11.2 years. The median MMAS, BIPQ, and FIQ scores were 3 (2-4), 50 (42-60), and 48.0 (36.0-57.8), respectively. Patients with higher disease severity, as classified by FIQ, had significantly lower MMAS scores ($p<0.05$) and higher BIPQ scores ($p<0.05$). A negative correlation was found between MMAS and BIPQ scores ($rho=-0.445$, $p<0.001$), and a moderate negative correlation was observed between MMAS and FIQ scores ($rho=-0.275$, $p=0.011$). Illness perception was positively correlated with FIQ scores ($rho=0.615$, $p<0.001$).

Conclusion

This study demonstrates that negative illness perceptions are strongly associated with poor treatment adherence and greater disease burden in fibromyalgia. These findings highlight the importance of assessing cognitive and psychosocial factors in routine FM care. Targeted interventions addressing illness beliefs may enhance adherence and improve patient outcomes in this multifaceted condition.

Key words

fibromyalgia, treatment adherence, illness perception, chronic pain

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Introduction

Fibromyalgia (FM), a syndrome characterised by chronic musculoskeletal pain, is common with a prevalence of 2% in the general population (1). In addition to widespread pain, various symptoms such as fatigue, poor sleep, mood disturbances, intestinal disorders and cognitive impairment are observed, all of which negatively affect quality of life (2, 3). Owing to the subjective presentation of symptoms and the absence of a diagnostic biomarker, fibromyalgia is diagnosed based on clinical criteria. Therefore, the diagnosis and management of FM continue to present significant challenges for patients and healthcare professionals alike (1).

The pathophysiological mechanisms underlying FM are not yet fully elucidated (3). However, FM is widely regarded as a disorder with a multifactorial aetiology, involving central sensitisation, neuroinflammatory processes, psychological factors, and neurobiological alterations (4-7). Recent studies have emphasised the potential role of anti-satellite glial cell immunoglobulin G antibodies and neuroinflammatory processes involving dorsal root ganglia in FM pathogenesis, supporting its complex and multifactorial nature (8). In addition to these, sociodemographic characteristics such as educational level and marital status have also been associated with symptom severity and functional burden in FM patients (9). This complex interplay highlights the need for comprehensive approaches to both understanding and managing fibromyalgia, emphasising not only its biological foundations but also the psychosocial dimensions of this debilitating condition.

Illness perception refers to how individuals evaluate, interpret, and respond to a health condition when confronted with it, and is considered one of the key factors influencing health behaviour (10). Several studies have investigated how illness perception affects health outcomes such as managing the illness, quality of life, and adherence in chronic conditions including diabetes, hypertension, and chronic fatigue syndrome (10-12). These studies have demonstrated that negative illness perceptions are associated with higher emotional distress, lower quality of life, and poorer health outcomes (11-14).

Non-adherence to treatment is observed through behaviours such as dose reduction, treatment discontinuation, non-compliance with prescriptions, and self-medication (15). Studies have shown that treatment adherence and persistence are considerably low among patients with FM as well (16). Psychosocial factors, health-related beliefs, and distrust toward the healthcare system have been identified as significant contributors to non-adherence, and a reciprocal relationship has been reported between quality of life and treatment adherence (16-18). In multifaceted and complex conditions such as FM, understanding and improving adherence is crucial for optimising patient outcomes. Although several studies have addressed treatment adherence in FM, further research is needed to explore the associated factors in greater depth.

The aim of this study is to investigate treatment adherence in patients with FM and to examine its relationship with associated factors, including illness perception and the severity of the disease.

Materials and methods

This cross-sectional study was conducted on 84 patients diagnosed with fibromyalgia (FM) according to the 2016 revised criteria of the American College of Rheumatology (19). Participants were recruited from the outpatient clinic of the Physical Medicine and Rehabilitation Department at BAIBU Izzet Baysal Physical Therapy and Rehabilitation Training and Research Hospital. Inclusion criteria were: age between 18 and 65 years, a confirmed diagnosis of FM for at least 6 months, the ability to comprehend and complete self-report questionnaires, and ongoing pharmacological treatment for FM. Patients with severe psychiatric disorders, cognitive impairments, or other uncontrolled chronic systemic diseases were excluded. The study was approved by the Non-Interventional Clinical Research Ethics Committee of Bolu Abant İzzet Baysal University (approval no: 2025/53), and written informed consent was obtained from all participants prior to data collection. All procedures were

Table I. Sociodemographic, clinical and comorbidity characteristics of the study population.

Sociodemographic characteristics		
Age (years)	M±SD	43.7 ± 11.2
BMI (kg/m²)	M±SD	27.1 ± 3.7
Height (cm)	M±SD	163.7 ± 8.3
Weight (kg)	M±SD	72.4 ± 9.2
Gender	Female / Male	67 (79.8%) / 17 (20.2%)
Marital status	Married / Single	62 (73.8%) / 22 (26.2%)
Education level	Primary / Secondary / High School / University	22 (26.2%) / 9 (10.7%) / 28 (33.3%) / 25 (29.8%)
Clinical features		
Smoking	Yes / No	21 (25%) / 63 (75%)
Alcohol Use	Yes / No	8 (9.5%) / 76 (90.5%)
MMAS	Md (Q1-Q3)	3 (2-4)
BIPQ	Md (Q1-Q3)	50(42-60)
FIQ	Md (Q1-Q3)	48.0 (36.0-57.8)
FIQ severity category	Mild / Moderate / Severe	30 (35.7%) / 37 (44%) / 17 (20.2%)
Medication use	Duloxetine / Pregabalin / SSRI	63 (75%) / 7 (8.3%) / 14 (16.7%)
Comorbidities		
	None	55 (65.5%)
	Hypertension	19 (22.6%)
	Diabetes mellitus	8 (9.5%)
	Thyroid disorder	8 (9.5%)
	Hyperlipidaemia	3 (3.6%)
	Coronary artery disease	5 (6.0%)
	Rheumatoid arthritis / Behçet's disease / gout	1 (1.2%)/ 1 (1.2%)/ 1 (1.2%)

MMAS: Morisky Medication Adherence Scale; BIPQ: Brief Illness Perception Questionnaire; FIQ: Fibromyalgia Impact Questionnaire; SSRI: selective serotonin reuptake inhibitors; M±SD: mean ± standard deviation; Md (Q1-Q3): median (1st - 3rd quartile values).

conducted in accordance with the ethical principles outlined in the Declaration of Helsinki.

Demographic data such as age, sex, marital status, education level, height, weight, smoking, alcohol use, and presence of comorbidities were recorded. Body mass index (BMI) was calculated as weight in kilograms divided by height in metres squared (kg/m²).

Medication adherence was assessed using the 8-item Morisky Medication Adherence Scale (MMAS), a self-reported measure commonly employed to evaluate patients' adherence behaviours. The MMAS yields a total score ranging from 0 to 8, with scores below 6 indicating low adherence, scores of 6–7 indicating moderate adherence, and a score of 8 reflecting high adherence (20). The Turkish version of the MMAS has been validated in chronic disease populations, demonstrating satisfactory psychometric properties (21).

Illness perception was evaluated using the Brief Illness Perception Questionnaire (BIPQ), an 8-item scale designed to assess the cognitive and emotional representations of illness. Each item is scored on a scale from 0 to 10, with higher scores indicating a more negative perception of illness (22). The Turkish adaptation of the BIPQ has shown strong internal consistency and construct validity among individuals with chronic health conditions (23).

The overall impact of fibromyalgia was measured using the Fibromyalgia Impact Questionnaire (FIQ), a widely accepted tool for assessing disease severity and functional impairment in FM patients. Total scores range from 0 to 100, with higher scores reflecting greater disease burden (24). The Turkish version of the FIQ has been culturally adapted and psychometrically validated, confirming its suitability for use in Turkish FM populations (25). Patients were grouped as mild (FIQ <39), moderate (FIQ 39–59), or severe (FIQ ≥60), in line with previously reported thresholds (26).

Statistical analysis

All statistical analyses were performed using JMP Pro 18 Student Edition (SAS Institute Inc., Cary, NC, USA). The normality of data distributions was assessed using the Shapiro-Wilk test. Descriptive statistics were reported as means ± standard deviations (SD) for normally distributed continuous variables, and medians with interquartile ranges (Q1-Q3) for non-normally distributed variables. Categorical variables were presented as frequencies and percentages. Group comparisons were performed using ANOVA or Kruskal-Wallis tests for continuous variables and chi-square tests for categorical data. Dunn-Bonferroni pairwise comparisons were conducted with post hoc tests where applicable. Relationships between continuous variables were analysed using Spearman correlation coefficients. A p-value <0.05 was considered statistically significant.

Results

A total of 84 patients diagnosed with FM were included in the study. The majority of participants were female (79.8%), married (73.8%), and had at least a high school education. The mean age of the sample was 43.7±11.2 years, with a mean BMI of 27.1±3.7 kg/m². Comorbid conditions were present in 34.5% of the participants, with hypertension being the most common (22.6%), followed by diabetes mellitus and thyroid disorders. The median scores for the MMAS, BIPQ, and FIQ were 3 (2–4), 50 (42–60), and 48.0 (36.0–57.8), respectively (Table I).

When patients were classified into mild (n=30), moderate (n=37) and severe (n=17) groups according to FIQ scores, the mean age was 41.4±10.6 years, 46.2±12.6 years, and 42.3±8.0 years, respectively (p=0.188). Female participants accounted for 83.3% (n=25), 78.4% (n=29), and 76.5% (n=13) of the mild, moderate, and severe groups, respectively (p=0.821). Analysis of MMAS and BIPQ scores across fibromyalgia severity groups, classified by FIQ, revealed significant differences (p=0.024 and p<0.001, respectively). MMAS scores were significantly lower in the severe group (median: 2 [Q1–Q3: 1.5–3.5]) compared to the mild group (median: 4 [Q1–Q3: 2–5]; p<0.05), with no significant difference between the moderate group (median: 3 [Q1-Q3: 2–4]) (p>0.05). BIPQ scores increased in accordance with disease severity,

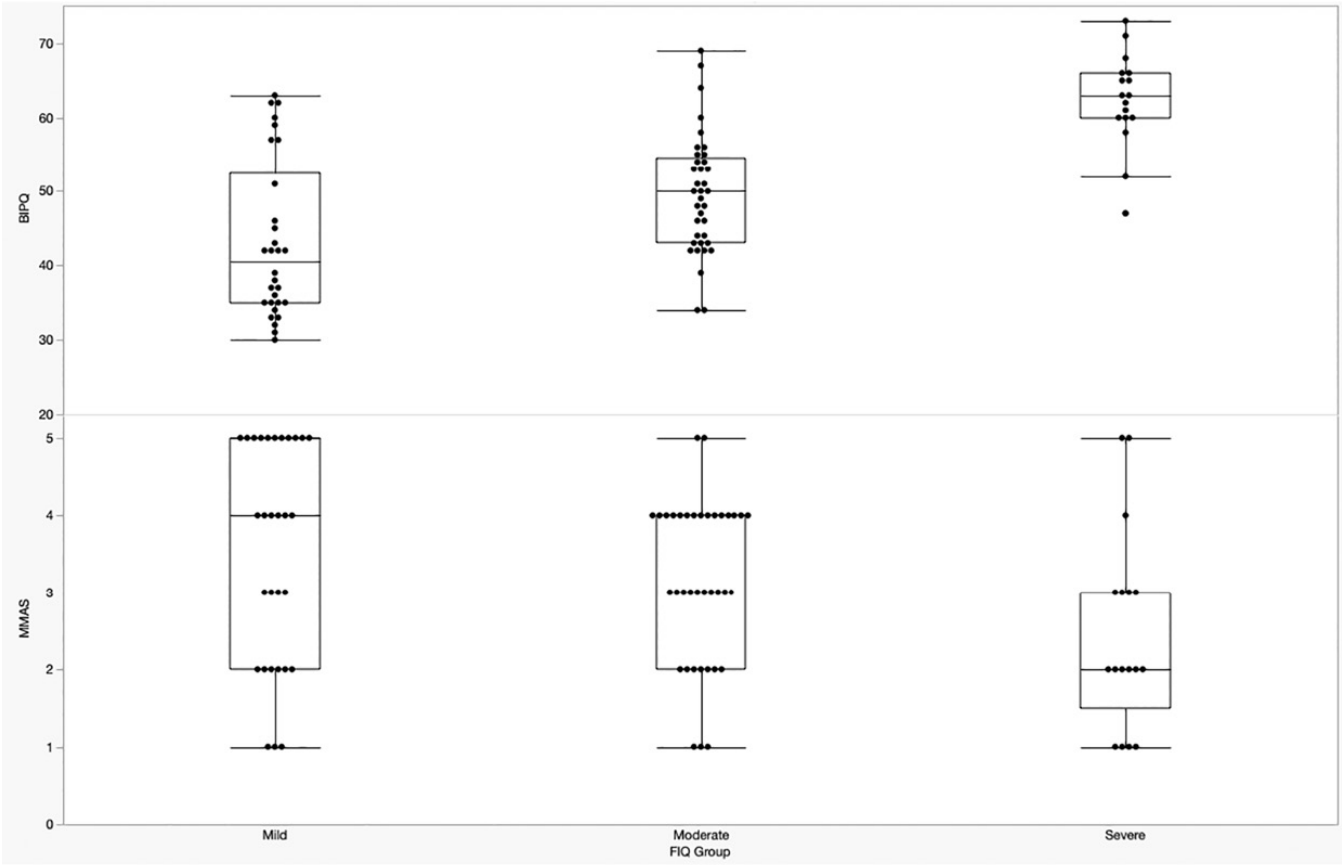

Fig. 1. Comparison of Morisky Medication Adherence Scale (MMAS) and Brief Illness Perception Questionnaire (BIPQ) scores among fibromyalgia patients grouped by disease severity (mild, moderate, severe) based on Fibromyalgia Impact Questionnaire classification.
MMAS was lower in the severe group *vs*. mild ($p<0.05$); other comparisons NS. BIPQ differed across all groups (all *$p<0.05$). Boxes show interquartile range; lines: medians; whiskers: 1.5×IQR; dots: individuals.

and all pairwise comparisons between the groups were statistically significant: mild (median: 40.5 [Q1–Q3: 35–52.5]), moderate (median: 50 [Q1-Q3: 43–54.5]), and severe (median: 63 [Q1–Q3: 60–66]) ($p<0.05$ for all) (Fig. 1).

A significant negative correlation was found between treatment adherence and illness perception scores (rho=-0.445, $p<0.001$). Treatment adherence was also negatively correlated with FIQ scores (rho=-0.275, $p=0.011$). Additionally, a strong positive correlation was observed between illness perception and FIQ scores (rho=0.615, $p<0.001$) (Fig. 2).

A subgroup analysis was performed to compare treatment adherence, illness perception, and fibromyalgia impact among patients receiving duloxetine (n=63), pregabalin (n=7) and selective serotonin reuptake inhibitors (SSRIs) (n=14). Median MMAS scores were 3 (IQR: 2–4) in the duloxetine group, 3 (1–4) in the pregabalin group, and 4 (2.75–5) in the SSRI group ($p=0.135$). BIPQ scores did not significantly differ between groups: duloxetine 50 (42–58), pregabalin 47 (36-60), SSRI 52.5 (38–62.25); $p=0.913$. Similarly, FIQ scores were comparable across treatment types: duloxetine 47 (37–55), pregabalin 66 (33–69), SSRIs 51.5 (30–63.5); $p=0.456$.

Discussion

This study examined the associations among treatment adherence, illness perception and fibromyalgia-related outcomes. Our findings revealed that lower adherence was significantly associated with more negative illness perceptions, increased functional limitations, and greater pain severity. These results highlight the critical role of cognitive and emotional factors in shaping health behaviours and clinical outcomes in chronic diseases.

Treatment adherence is essential for achieving optimal long-term outcomes in chronic illness. However, poor adherence is frequently observed in patients with chronic pain and must be considered in therapeutic decision-making (15, 27). Prior studies have identified various factors influencing adherence in this population, including socioeconomic status, quality of the physician-patient relationship, pain intensity, polypharmacy, and age (27). In FM, non-adherence often involves dose reduction or treatment discontinuation (17) and low adherence has been linked to discordant physician-patient communication, pain severity and psychological distress (28, 29). Conversely, higher adherence has been associated with improved quality of life (17). In our study, we similarly observed that treatment adherence was generally low among FM patients. Participants classified in the severe FIQ group had significantly lower MMAS scores compared to those with mild disease, underlining the relevance of symptom severity in adherence patterns. The observed negative

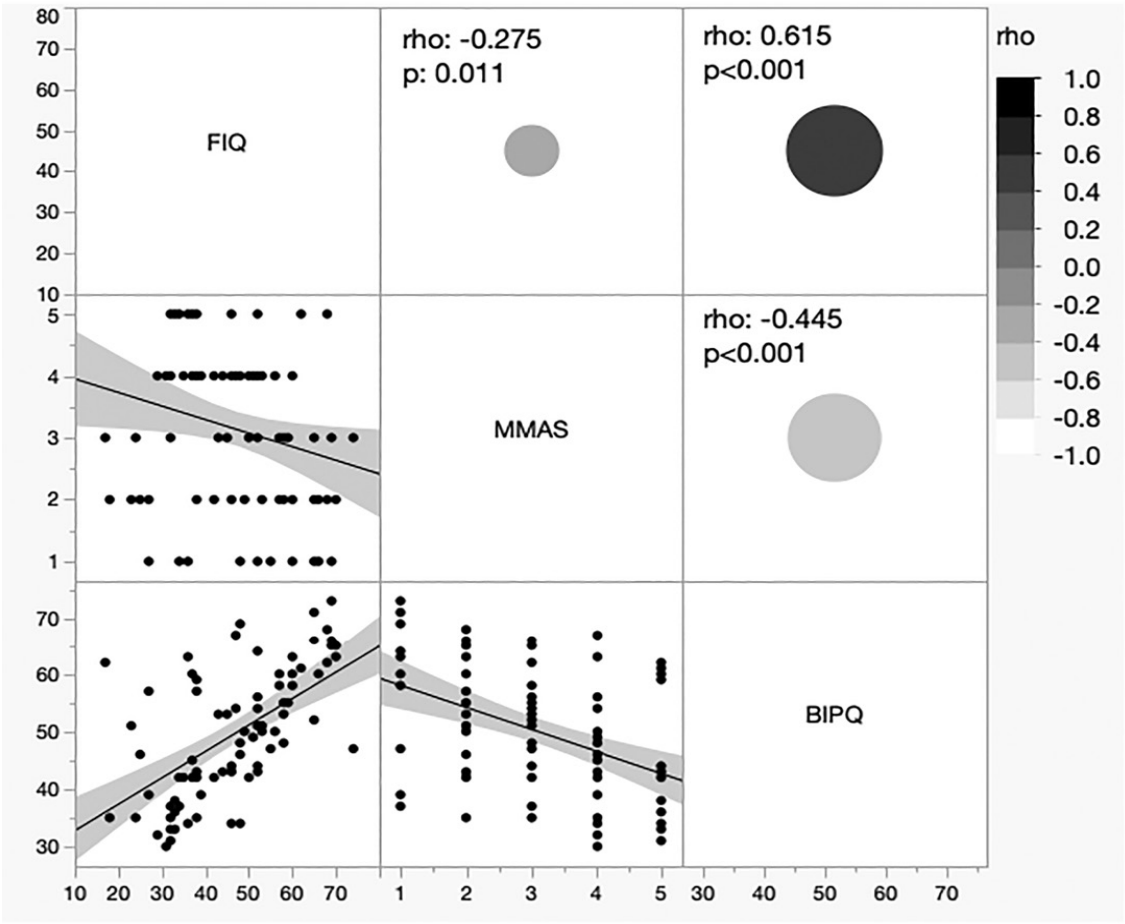

Fig. 2. Associations between Morisky Medication Adherence Scale (MMAS), Brief Illness Perception Questionnaire (BIPQ), and Fibromyalgia Impact Questionnaire (FIQ).
Each relationship is illustrated with scatter points and fitted regression lines, while the size of the circles reflects the strength of the correlations. Correlation coefficients are Spearman's rho values.

correlation between MMAS and FIQ scores further supports this association. A central finding of our study is the robust relationship between illness perception and both treatment adherence and disease impact. Patients with more negative illness perceptions, as assessed by BIPQ, exhibited significantly lower adherence and higher FIQ scores. These results are in alignment with longitudinal evidence demonstrating that maladaptive illness beliefs, particularly perceptions of limited treatment control and strong emotional representations, are predictors of anxiety, depression, and worse clinical outcomes in FM (29). Furthermore, van Wilgen *et al*. emphasised that illness perceptions influence not only quality of life but also catastrophising and disability in FM (14). Emerging neuroimaging and biomarker studies have shown that FM patients exhibit signs of central sensitisation and glial activation, which may reinforce negative illness perceptions and amplify symptom burden (30).

In our study, treatment adherence was also found to be associated with disease severity. As disease impact increased (measured by FIQ), MMAS scores significantly declined. This is consistent with previous findings suggesting that increased symptom burden may contribute to emotional exhaustion and learned helplessness, both of which may impair adherence behaviour (31). Similarly, Ruiz-Montero *et al*. emphasised that maladaptive illness beliefs are more common in FM patients with higher levels of functional disability and emotional representation scores (32).

Our findings also reveal a strong positive correlation between illness perception and FIQ scores, reflecting the multidimensional and interdependent nature of clinical and cognitive variables. As previously stated by van Ittersum *et al*., illness perceptions are dynamic constructs that influence both somatic and emotional domains of FM, shaping healthcare-seeking behaviour and self-management strategies (33). The associations found in our study reinforce the explanatory power of self-regulation models in understanding behavioural patterns in chronic pain populations.

From a clinical standpoint, these findings underscore the importance of assessing and addressing illness perceptions in FM management. In our study, treatment type (duloxetine, pregabalin, or SSRIs) was not significantly associated with adherence levels, illness perception, or FIQ scores, suggesting that these psychosocial and functional outcomes may be influenced more by individual factors than by medication class alone. Efforts to improve adherence

should extend beyond pharmacological strategies and incorporate psychoeducational and cognitive-behavioural interventions that enhance illness understanding, perceived control, and treatment expectations. Given that FM is characterised by chronic pain and prominent psychological dimensions (34), adherence behaviours must be considered a key component of effective treatment planning.

Limitations of this study include its cross-sectional design, which precludes causal inference, and the use of self-reported questionnaires, which may introduce response bias. The sample, drawn from a single tertiary care centre, may also limit generalisability. In addition, the analysis of pharmacological treatment subgroups was limited by the restricted range of medications represented in the sample and small sample sizes within certain treatment groups. Future longitudinal and interventional studies involving larger and more pharmacologically diverse cohorts are warranted to explore the causal relationships between illness perception, adherence behaviour, and clinical outcomes, as well as to evaluate the effectiveness of targeted cognitive restructuring interventions and treatment-specific adherence patterns.

In conclusion, this study provides compelling evidence that illness perceptions may play a central role in shaping treatment adherence and perceived disease burden in fibromyalgia. A patient-centred approach that integrates cognitive and psychosocial assessment into routine care may enhance therapeutic engagement and improve long-term outcomes in this complex and often misunderstood condition.

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