BMC Rheumatology

RESEARCH Open Access

Beliefs of Moroccan patients with chronic inflammatory rheumatic diseases regarding medication: related factors and correlation with therapeutic adherence

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Abstract

Background Medication adherence is one of the key elements of the management of patients with chronic inflammatory rheumatic diseases (CIRDs), adherence/medication regimes are prone to being influenced by beliefs about medicines; such beliefs can influence the management and quality of life of patients. Several factors may be associated with these beliefs, including demographic and clinical factors, as well as socio-psychological factors. The aim of this study is to assess beliefs regarding medications among Moroccan patients with CIRDs, the factors associated with these beliefs, and the correlation of these factors with medication adherence.

Material and method This cross-sectional study included patients with CIRDs. Sociodemographic data, comorbidities, and information about CIRDs (type, disease duration, pain evaluation, disease activity and treatments) were collected. Beliefs regarding medication were assessed by the Belief about Medicine Questionnaire (BMQ). Therapeutic adherence was assessed using the Arabic version of the Compliance Questionnaire in Rheumatology (CQR). Sociopsychological factors, such as catastrophism and trust in physicians, were assessed by the Pain Catastrophizing Scale (PCS) and the Trust in Physicians Scale (TPS), respectively.

Result Our sample included 189 patients. The average age was 47.49 ± 13.7; 52.4% had comorbidities; and 49.2% had a low level of education. Of the patients, 49.7% were on glucocorticoids, 61.9% on conventional synthetic disease-modifying antirheumatic drugs and 6.3% on biologics. The median necessity-concern differential was 6 [1–12]. Of the patients, 67.4% strongly believed that medication was essential to maintain their health. The long-term side effects were the main concerns about medicines (51.3%). In a multivariate analysis, there was a statistically significant association between low level of education, catastrophizing, methotrexate use, and trust in the physician as independent factors and the BMQ necessity-concern differential as the dependent factor. There was also a significant correlation between CQR and the BMQ necessity score.

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Conclusion Moroccan patients with CIRDs have a rather positive perception of their medication. This perception seems to influence their adherence to treatment. Low levels of education, catastrophizing, methotrexate use, and trust in physicians are the most important factors associated with patients' beliefs regarding medication.

Keywords Chronic inflammatory rheumatic diseases, Therapeutic adherence, Beliefs about medicines, BMQ

Background

Chronic inflammatory rheumatic diseases (CIRDs) are chronic and progressive diseases, that often require complex and continuous therapy with multiple highly effective medications, including Disease-Modifying Anti Rheumatic Drugs (DMARDs). Current guidelines recommend that these medications be introduced early in the course of rheumatic disease to reduce disease activity, prevent the resulting damage, and improve the quality of life of patients [1].

Poor compliance with prescribed medications is a significant issue and remains an obstacle to improving the clinical outcomes of the diseases. For example, therapeutic adherence in rheumatoid arthritis is highly variable and, typically, suboptimal, with reports of adherence to conventional DMARDs ranging from 30 to 80% [2]. According to the World Health Organization, medication adherence refers to patient behaviors related to adherence to medication use, diet, and lifestyle as directed by health care providers [3]. Non-adherence to medication can be a reason for treatment failure, delayed cure, and accelerated disease progression [4, 5].

Therapeutic compliance is influenced by a multitude of factors, particularly beliefs and attitudes regarding medications. According to Horne, beliefs about medications are considered factors that influence medication adherence and are more predictive of adherence than sociodemographic or clinical factors, all of which will influence patient management and quality of life [6]. It could be extremely useful to know the factors that can be acted upon to change negative beliefs. Several studies have examined clinical and demographic factors associated with beliefs regarding medicines, but there is a gap in the knowledge regarding psychosocial factors such as catastrophism and trust in physicians. In addition, there is a lack of studies on beliefs regarding drugs among Moroccan patients with inflammatory rheumatic diseases. The aim of this study is to assess Moroccan CIRDs beliefs about medication as well as to explore the factors contributing to these beliefs and their correlation with medication adherence in this population.

Methods

Study design and patients

We conducted a cross-sectional study that included patients diagnosed with rheumatoid arthritis (RA) according to the American College of Rheumatology (ACR)/European League Against Rheumatism (EULAR) [7], spondyloarthritis (SpA) according to the Assessment of SpondyloArthritis international Society (ASAS) classification criteria for the axial/peripheral spondyloarthritis [8], and undifferentiated inflammatory arthritis (UDIA), who presented for consultation or hospitalization in the rheumatology department and who agreed to take part in the study, from February to September 2022 at the Rheumatology Department of the Mohammed VI University Hospital Center of Tangier. Patients with cognitive disabilities that prevented them from completing the questionnaires and patients under 18 years old were excluded.

This study was approved by the University Hospital Center Ethics Committee of Tangier under the number 01/2022. All participants provided informed consent according to the Declaration of Helsinki.

Questionnaire

Clinical assessment

The first section of the questionnaire included 11 questions related to the patients' sociodemographic characteristics. The second section included information about comorbidities and the characteristics of CIRDs (type, duration, disease activity and current treatments). Past or current comorbidities were assessed using a predefined, non-exhaustive list of selected comorbidities: hypertension, diabetes, dyslipidemia, cardiovascular diseases (myocardial infarction or stroke), tuberculosis infection, cancer and lymphoma, gastrointestinal diseases (ulcers, inflammatory bowel diseases), hepatitis, pulmonary diseases (chronic obstructive pulmonary disease, asthma), chronic kidney disease, osteoporosis and depression. The Visual Analogue Scale (VAS) was used to rate pain. The Disease Activity Score 28 (DAS28 cut-off: <2.9: remission; ≥ 2.9 and ≤3.2: low disease activity ; > 3.2 and ≤5.1 : moderate disease activity ; > 5.1 : high disease activity.) and Ankylosing Spondylitis Disease Activity Score (ASDAS cut-off: <1.3: remission; ≥ 1.3 and ≤2.1 : low disease activity, > 2.1 and ≤3.5 : moderate disease activity ; > 3.5 : high disease activity.) were used to assess disease activity.

Beliefs about medicines

Beliefs about medicines were assessed with the validated Arabic version of the Belief on Medicine Questionnaire-specific (BMQ specific) [9]. The BMQ-Specific consists of two sub-scales: the Specific-Necessity scale and the Specific-Concerns scale. The Specific-Necessity scale (which includes five items) assesses perceptions of the need for

medication to control the disease and improve or maintain health, while the Specific-Concerns scale (which includes five items) evaluates perceptions of potential negative consequences of taking the medication, including concerns related to beliefs about long-term effects, dependence, and other disruptive effects.

Each item on the BMQ scales is scored on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scores for the individual items were added together for a sub-scale score. Total scores range from 5 to 25 for the Specific-Necessity sub-scale and the Specific-Concerns sub-scale. Higher scores indicate stronger beliefs in the concepts represented by each sub-scale. The BMQ can be expressed as a necessity-concerns differential, which is the difference between the necessity scale and concern scale scores.

Table 1 Socio-demographic and clinical characteristics of the study population

	N **= 189**
Female gender (*n* = 189) [a]	143 (75.7)
Age (*n* = 189) [b]	47.49 ± 13.7
Educational level (*n* = 189) [a]	
Informal education	93 (49.2)
Primary	34 (18)
Secondary	30 (15.9)
University	32 (16.9)
Monthly income (*n* = 153) [a]	
Low income (< 2500 MAD)	94 (49.7)
Middle income (≥ 2500 and ≤ 10000 MAD)	56 (29.6)
High income (> 10000 MAD)	3 (1.6)
Missing data	36 (19.1)
Comorbidity (*n* = 189) [a]	
No	90 (47.6)
Yes	99 (52.4)
Diagnosis (*n* = 189)[a]	
Rheumatoid arthritis	107 (56.6)
Spondyloarthritis	67 (35.4)
Undifferentiated inflammatory arthritis	15 (8)
Duration of the disease in years (*n* = 189) [c]	8 [3–16.75]
VAS pain (*n* = 189) [c]	5 [3–7]
Disease activity (*n* = 189) [a]	
Remission	71 (37.6)
Low activity	22 (11.6)
Moderate activity	48 (25.4)
High activity	48 (25.4)
Current treatment (*n* = 189) [a]	
NSAIDs	51 (27)
Corticotherapy	94 (49.7)
Methotrexate	101 (53.4)
bDMARDs	12 (6.3)
Etanercept	2 (1)
Infliximab	3 (1.6)
Rituximab	6 (3.2)
Tocilizumab	1 (0.5)

Values are given as frequency and percentage ([a]), mean ± standard deviation ([b]), and median and interquartile range([c])

bDMARDs: biological Disease-Modifying Anti Rheumatic Drugs; MAD: Moroccan Dirham; NSAIDs Non-steroidal anti-inflammatory drugs; VAS: Visual Analogue Scale

Therapeutic adherence

The therapeutic adherence was assessed through the validated Arabic version of the Compliance Questionnaire for Rheumatology (CQR) [10]. A score of 80/100 or more places a patient in the "good adherence" category, and a lower score places a patient in the "patients with adherence problems" category.

Other variables

To find associated factors, we assessed interpersonal trust, as it concerns the patient-physician relationship, using the Trust in Physician Scale Questionnaire (TPS) [11]. The TPS includes 11 items, each of which is scored on a 5-point Likert scale (1 through 5). The total score is the average of the individual scores for each item; higher values indicate positive perceptions.

Pain catastrophization was assessed using the Arabic version of the Pain Catastrophization Scale (PCS) [12]. This scale consists of 13 questions in which individuals are asked to indicate the extent to which they have certain thoughts and feelings when experiencing pain by referring to a scale from 0 (not at all) to 4 (all the time). A PCS score of 30 or higher represents a high level of catastrophizing.

Data analysis

A descriptive analysis was conducted. Qualitative variables were represented by numbers and percentages. Mean and standard deviation were used for quantitative variables if they were normally distributed; otherwise, they were expressed in medians and quartiles. Linear regression was implemented to assess factors associated with beliefs about medicines. To examine the relationship between medication adherence and beliefs about medications, we performed a univariate correlation analysis using Pearson correlation. The data was analyzed using IBM SPSS version 21.0 statistical software. A p value < 0.05 was considered statistically significant.

Results

Our study included 189 patients. The sociodemographic and clinical characteristics of the patients are presented in Table 1. The average age was 47.49 ± 13.7. Of the patients, 75.7% were women. Furthermore, 52.4% of the patients had comorbidities, and 49.2% had a low level of education.

The median duration of the evolution of CIRDs was 8 [3-16.75] years, and 39.2% of the patients were in remission. Approximatively 50% of patients were on glucocorticoids. Of the 61.9% of patients on conventional synthetic DMARDs (csDMARDs), 86.2% were on

Table 2 Beliefs of Moroccan patients with inflammatory rheumatic diseases regarding medication

BMQ-Specific	**BMQ-Concern** :		Agree or strongly agree
		Having to take medicines worries me	36.4%
		I sometimes worry about the long-term effects of my medicines	51.3%
		My medicines are a mystery to me	50.8%
		My medicines disrupt my life	33%
		I sometimes worry about becoming too dependent on my medicines	50.2%
		Score total	**14.47 ± 5.8**
	BMQ-Necessity :	My health, at present depends on these medicines	78.7%
		My life would be impossible without my medicines	48.7%
		Without my medicines I would become very ill	82.9%
		My health in the future will depend on my medicines	72.5%
		My medicines protect me from becoming worse	87%
		Score total	**20.75 ± 4.77**
BMQ Differential			**6[1–12]**

Table 3 Uni- and multivariate analyses for BMQ necessity-concern differential

	Univariate analysis		**Multivariate analysis**	
	β [IC 95%]	***P***	**β [IC 95%]**	***p***
Gender	0.933 [-1.551–3,416]	0.460		
Age	0.120 [0.041–0.199]	**0.003**	0.048 [-0.038–0.135]	0.269
Low level of education	-1.299 [-2.201 – -0.396]	**0.005**	-1.092 [-2.068 – -0.117]	**0.028**
Comorbidity	0.035 [-1.345–1.415]	0.960		
Disease duration in years	0.020 [0.094–0.135]	0.725		
VAS pain	0.123 [-0.266–0.512]	0.535		
Disease activity	0.991 [0.113–1.869]	**0.027**	0.537 [-0.385–1.459]	0.251
Corticotherapy use	2.024 [-0.061–4.110]	0.057		
Methotrexate use	3.283 [1.185–5.381]	**0.002**	2.604 [0.314–4.893]	**0.026**
Biologic therapy use	3.534 [-0.888–7.956]	0.117		
PCS	-2.650 [-4.833 – -0.467]	**0.018**	-2.461 [-4.713 – -0.210]	**0.032**
TPS	0.288 [0.138–0.439]	**< 0.001**	0.198 [-0.040–0.357]	**0.014**

VAS: Visual Analogue Scale; PCS: Pain Catastrophization Scale; TPS : Trust in Physician Scale

methotrexate and only 6.3% on biologics. The mean CQR in patients with CIRDs was 80.61 ± 15.14.

The beliefs regarding medication among Moroccan patients with CIRDs are displayed in Table 2. The mean of the specific BMQ necessity was 20.75 ± 4.77. Of the patients, 67.4% strongly believed that medication was essential to maintaining their health. The mean of the specific BMQ concerns was 14.47 ± 5.8. The long-term side effects were the main concerns about medicines (51.3%). The median BMQ necessity-concern differential (BMQ differential) was 6 [1–12] and 73% of patients had a BMQ necessity-concern differential > 0, which suggested a positive benefit-risk ratio perceived by the patients.

In the multivariate analysis, there was a statistically significant association between the BMQ necessity-concern differential and a low level of education (ß =-1.092 IC95%(-2.068 – -0.117), $p=0.028$), methotrexate use (ß =2.604 IC95%(0.314–4.893), $p=0.026$), catastrophizing (ß =-2.461 IC95% (-4.713 – -0.210) $p=0.032$), and trust in the physician (ß =0.198 IC95% (0.040–0.357), $p=0.014$) (Table 3).

Table 4 Correlation between therapeutic adherence and patients' beliefs about medications

	R	***p***
BMQ Differential	0.18	**0.02**
BMQ Necessity	0.22	**0.004**
BMQ Concern	-0.05	0.4

As presented in Table 4, there was a significant correlation between CQR and BMQ, specifically the BMQ necessity ($r=0.18$, $p=0.02$) and the BMQ differential ($r=0.22$, $p=0.004$).

Discussion

In our study, 73% of Moroccan patients with CIRDs had a positive BMQ differential, which means that they have a positive benefit-risk ratio perception. Of the respondents, 87% stated that their medicine "protects them from becoming worse". The long-term side effects were the main concerns regarding medicines, which was reported by almost half of the sample. Low level of education, use of methotrexate, catastrophizing, and trust in the physician were the main factors associated with beliefs about

medication in CIRDs patients. We also found a significant correlation between CQR and BMQ, precisely the BMQ necessity and the BMQ differential.

The perception of a positive benefit-risk ratio regarding medication in CIRDs patients, which means concern is lower than necessity, seemed to align with previous studies from several countries (US, spain, Italy…) [13–16]. Beliefs regarding medication are based on beliefs about drugs in general or certain types of drugs (immunosuppressants, etc.) and also on the patient's experience with the same or similar treatments. However, studies have shown that these beliefs are dynamic and can change as the disease progresses and patients' experiences change [17]. The patients will construct this benefit-risk ratio based on the perceived effectiveness of the drug (relief of pain and improvement in quality of life) and its disadvantages (side effects and feeling of dependence on the drugs). In a qualitative study conducted in UK that considered methotrexate separately, Hayden et al. have shown that patients change their perception of treatment over time, based on perceived efficacy and the occurrence of side effects, and that, ultimately, most patients accept methotrexate because they become convinced that the need for the medicine outweighs the potential risks [18]. Regarding biological treatments, in their study on the beliefs of a sample of Spanish rheumatoid arthritis patients about their subcutaneous biological drug, Cea Calvo et al. found that most patients (>70%) strongly believe in the necessity of their treatment, even if they had concerns about long-term side effects. They identified four attitudinal profiles: 56.7% of patients were "ambivalent" (high need/high concern), 36.1% were "accepting" (high need/low concern), 5% were "indifferent" (low need/low concern), and 2.2% were skeptical (low need/high concern) [14].

The mean CQR among our patients with CIRDs was 80.61 ± 15.14, with 65% having a CQR > 80/100, which suggests good therapeutic adherence. We found that there was a significant correlation between adherence and necessity scores but not with concern scores. This result is consistent with the results of the McCulley et al. study which showed that only the BMQ necessity score was independently associated with better adherence to oral DMARDs or prednisone in American patients treated for rheumatoid arthritis [13]. Suh et al. have also shown that less belief in the necessity of medication was associated with intentional non-adherence in a sample of Korean patients with rheumatoid arthritis [19]. However, other studies have shown that concerns about medication influence adherence. In Belgium, Horne et al. have shown that both medication concern and necessity scores were strongly correlated with adherence to subcutaneous anti-TNFα therapy in patients with rheumatoid arthritis [20]. The same authors have shown in a meta-analysis published in 2013 that greater adherence was associated with stronger perceptions of the need for treatment and less concern about treatment [6].

Regarding the factors associated with patients' beliefs about medicines, our study found that a low level of education was negatively associated with patients' perceived benefit-risk ratio. This result is consistent with the study conducted in UK by Kumar et al., who found a significant association between the BMQ general harm score and a low level of education [21]. This implies that rheumatologists should take more time to provide therapeutic education to illiterate patients to improve their perception of medicines and, consequently, their adherence to treatment.

Regarding clinical factors, we did not find an association between beliefs about medication and CIRD activity or duration. Previous studies have shown that a long disease course increases patients' perceptions of the need for treatment [22, 23]. In UK, Neame et al. found that concern and perception of the need for treatment increased with increasing levels of pain, which suggests that patients with uncontrolled disease are more aware of the need for treatment but also more concerned about side effects [23].

For factors related to treatments, we found a significant association between methotrexate use and a positive perception of medication. This result can be explained by the fact that, in our sample with poor access to biotherapy, patients consider methotrexate (probably under the guidance of their treating physicians) as the key treatment for their chronic inflammatory rheumatism. With regard to other anti-rheumatic drugs, Tosato et al. found that anti-TNF use was significantly associated with necessity score in a sample of Italian patients [16]. According to the same study, the number of treatments taken increased both necessity and concern scores [16]. Similarly, the qualitative study by Kumar et al. found that patients of south Asian origin who had received several therapeutic classes without achieving remission lost confidence in the necessity and efficacy of other treatments [24].

The main finding of our study is the significant positive association between the level of trust in the physician and the necessity-concern differential. This means that patients who have more confidence in their rheumatologist are more aware of the need for their treatment and less concerned about side effects. To the best of our knowledge, this is the first study to raise this point. It seems clear that trust in physicians can have a significant impact on patient outcomes and enhance patients' active involvement in their own care. In fact, several studies have shown that trust in physicians is one of the key elements in patient decision making related to anti rheumatic drugs in rheumatoid arthritis [25] and shared decision making in general [26].

Finally, another psychological factor involved in perceptions of medicines, according to our study, is catastrophism. The higher the catastrophism score, the lower the benefit-risk ratio perceived by the patient. Indeed, several studies have suggested a negative impact of catastrophism on pain-related outcomes, disability, and the likelihood of achieving remission [27–29]. Beliefs about medicines strengthen likely this impact. To the best of our knowledge, this is the first study to have investigated this association.

The limitations of this study include the cross-sectional design and the limited geographic nature of our survey, and we did not analyze every type of medication. All these factors can affect the generalizability of our results. We also used a self-report method to assess medication adherence. Therefore, an overestimation of adherence may have occurred. Finally, attitudes, opinions, and beliefs are likely to change over time, especially after pandemics.

Conclusion

Moroccan patients treated for inflammatory rheumatic disease have a rather positive perception of their medication. Our results highlight the importance of beliefs regarding medications in relation to medication adherence. By assessing patients' beliefs about medication, especially patients with a low level of education and a high level of catastrophism, therapeutic non-adherence can potentially be reduced. Building trust in the physician is also a way of improving beliefs regarding medicines. Future studies should also explore the impact of medication and disease beliefs on other critical components of the self-management of inflammatory rheumatic disease.

Abbreviations

ACR	American College of Rheumatology
ASAS	Assessment of SpondyloArthritis international Society
ASDAS	Ankylosing Spondylitis Disease Activity Scor
bDMARDs	Biological: Disease-Modifying Anti Rheumatic Drugs
BMQ	Belief on Medicine Questionnaire
csDMARDs	Conventional synthetic Disease-Modifying Anti Rheumatic Drugs
CIRD	Chronic inflammatory rheumatic disease
CQR	Compliance Questionnaire for Rheumatology
DAS28	Disease Activity Score
DMARD	Disease-Modifying Anti Rheumatic Drugs
EULAR	European League Against Rheumatism
PCS	Pain Catastrophization Scale
RA	Rheumatoid arthritis
SpA	Spondyloarthritis
TNF	Tumor necrosis factor
TPS	Trust in Physician Scale
UDIA	Undifferentiated inflammatory arthritis
VAS	Visual Analogue Scale

Acknowledgements

We are grateful to all the patients who accepted to participate in this study.

Author contributions

FZT elaborated the idea of the study, participated in study design and revised the draft manuscript. NE participated in study design, participated in patients' enrollment and drafted the manuscript. RB participated in study design and in patients' enrollment. AA participated in study design and in patients' enrollment. AA participated in study design and performed statistical analysis. MF participated in study design and revised the draft manuscript. FEA contributed in the study design, coordinated the study and revised the draft manuscript. All authors read and approved the final manuscript.

Funding

Not applicable.

Data availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

The study protocol was approved by the University Hospital Center Ethics Committee of Tangier under the number 01/2022. All procedures performed on this study were in accordance with the ethical standards of the 1964 Helsinki declaration. Informed consent was obtained from all individual participants included in the study.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

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Received: 29 August 2023 / Accepted: 11 September 2024
Published online: 18 September 2024

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