

Treatment satisfaction with rheumatoid arthritis in patients with different disease severity and financial burden: A subgroup analysis of a nationwide survey in China

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Abstract

Background: Despite the recent advances in treatments for rheumatoid arthritis (RA), there are still unmet needs in disease outcomes. This study aimed to analyze the satisfaction with drug therapies for RA according to the levels of disease severity (patient-assessed) and proportions of treatment cost to household income.

Methods: This was a subgroup study of a cross-sectional study in patients with RA and their physicians. The patients were subdivided into different subgroups based on their self-assessed severity of RA and on the proportions of treatment cost to household income (<10%, 10–30%, 31–50%, and >50%). The Treatment Satisfaction Questionnaire for Medication version II was used to assess patients' treatment satisfaction.

Results: When considering all medications, effectiveness, convenience, and global satisfaction scores were lower in the severe and moderate RA subgroups than those in the mild and extremely mild RA subgroups (all $P < 0.001$). Effectiveness, side effects, and convenience scores were higher in the <10% subgroup compared to those in the >50% subgroup (all $P < 0.05$). Global satisfaction score was higher in the <10% subgroup than that in the 31% to 50% subgroup ($F = 13.183$, $P = 0.004$). For biological disease-modifying anti-rheumatic drugs, effectiveness and convenience scores were lower in the severe RA subgroup than those in the extremely mild RA subgroup (both $P < 0.05$). Convenience score was higher in the <10% subgroup compared to that in the 31% to 50% and >50% subgroups ($F = 12.646$, $P = 0.005$). Global satisfaction score was higher in the <10% subgroup than that in the 31% to 50% subgroup ($F = 8.794$, $P = 0.032$).

Conclusion: Higher disease severity and higher financial burden were associated with lower patient satisfaction.

Keywords: Disease severity; Rheumatoid arthritis; Treatment cost; Treatment satisfaction

Introduction

Deep clinical remission can be achieved in patients with rheumatoid arthritis (RA), but achieving this treatment goal requires intensive management.^[1] The treat-to-target

(T2T) strategy is recommended for the treatment of RA, which aims at maximizing the long-term quality of life by preventing the structural damage and normalizing the social and work-related activities.^[2,3] Nevertheless, recent

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studies indicated that the level of diagnosis and treatment for RA in China is still in the developmental stage, and a good implementation of the T2T strategy has not been observed yet.^[4,5]

Despite the recent advances in treatments for RA, there are still unmet needs in disease outcomes. In fact, studies highlighted that safety issues, therapeutic regimen, remission duration, and compliance still require attention.^[6,7] Dissatisfaction with treatment will lead to poor compliance, which will inevitably affect the patients' outcomes.^[8-10] Therefore, a better understanding of patients' satisfaction can help for the optimal use of medications for RA treatment.

The Chinese Registry of Rheumatoid Arthritis (CREDIT) is so far the largest nationwide cohort of RA in China, showing the prevalence of remission and comorbidities, and the risk factors of comorbidities in patients with RA.^[4,5] Nevertheless, the CREDIT study did not address the problem of patients' satisfaction with RA treatments, which has to be solved to improve patient management.

Therefore, to improve our understanding of the satisfaction of Chinese patients with RA treatment, the present study aimed to analyze the satisfaction with drug therapies for RA according to the levels of disease severity (patient-assessed) and proportions of treatment cost to household income.

Methods

Ethical approval

This study was approved by the research ethics committee of Peking Union Medical College Hospital (No. S-K432), which was accepted by all participating centers as the central institutional review board. All participants signed an informed consent form for participation in the original study and eventual subgroup studies.

Study design and population

This was a subgroup analysis of a cross-sectional study in patients with RA and their physicians that was conducted between March 2018 and April 2018 in 12 hospitals from 11 provinces, municipalities, and autonomous regions in China. In addition, all hospitals, physicians, and patients were participating in the CREDIT registry.^[4,5] In the original study, the eligibility criteria were: (1) ≥ 18 years of age; and (2) having been diagnosed with RA for > 6 months according to the 2010 American College of Rheumatology (ACR)/European League Against Rheumatism (EULAR) classification criteria.^[11] The exclusion criteria were: (1) had not yet received RA treatment; or (2) had comprehension barriers to reading Chinese.

Subgrouping

This study included two subgroup analyses. The patients were subdivided into different subgroups and then analyzed according to their self-assessed severity of RA

(severe, moderate, mild, and extremely mild), or the proportion of treatment cost relative to household income ($< 10\%$, $10\text{--}30\%$, $31\text{--}50\%$, and $> 50\%$).

Questionnaires

In the original study, a patient questionnaire was used to collect the sociodemographic characteristics, medical history, and factors affecting long-term treatment. The outpatients were surveyed during a routine treatment follow-up visit. Disease activity score in 28 joints (DAS28) and the patient global assessment of RA disease activity were collected by the physicians.

The Treatment Satisfaction Questionnaire for Medication, version II (TSQM-II), was used to assess patients' treatment satisfaction,^[12] which includes 11 questions on four domains: (1) treatment effectiveness; (2) side effects; (3) convenience of administration; and (4) global satisfaction. Each domain is scored from 0 (extremely dissatisfied) to 100 (extremely satisfied). Patients' satisfaction was assessed using the TSQM-II for all medications and biological disease-modifying anti-rheumatic drugs (bDMARDs) they ever received. Targeted synthetic DMARDs (tsDMARDs) were included in bDMARDs to simplify the questionnaire.

Statistical analysis

SPSS 20.0 (IBM, Armonk, NY, USA) was used for statistical analysis. Continuous variables in accordance with normal distribution were expressed as mean \pm standard deviation (SD) and compared using the one-way analysis of variance (ANOVA). Skewed continuous variables were expressed as medians (interquartile range) and compared using Kruskal-Wallis test. Categorical variables were presented as frequencies (percentage) and analyzed using the Chi-squared test. P values < 0.05 were considered statistically significant.

Results

Baseline characteristics of patients subgrouped by self-assessed severity of RA

Table 1 presents the characteristics of patients with different self-assessed disease severity. Older age ($F = 31.503$, $P < 0.001$), lower education level ($\chi^2 = 69.927$, $P < 0.001$), longer disease duration ($\chi^2 = 90.623$, $P < 0.001$), more use of glucocorticoids ($\chi^2 = 10.259$, $P = 0.016$) and bDMARDs ($\chi^2 = 9.111$, $P = 0.028$), and higher proportion of treatment costs ($\chi^2 = 123.569$, $P < 0.001$) were observed with the increase of patient-assessed disease severity, showing the significant differences among the subgroups. There were no significant differences in sex, use of csDMARDs, communication with physicians, and satisfaction toward general diagnosis and treatment services.

Satisfaction summary of patients with various self-assessed severity of RA

The TSQM-II summary scores of patients with different self-assessed disease severity are shown in Table 2. When

Table 1: Characteristics of the patients with different self-assessed severity of RA.

Characteristic	Severe (n = 230)	Moderate (n = 543)	Mild (n = 425)	Extremely mild (n = 39)	F χ^2	P
Age (years), median (IQR)	54 (45, 63)	49 (41, 58)	47 (38, 55)	48 (40, 55)	31.503*	<0.001
Sex, n (%)					1.070†	0.784
Male	38 (16.5)	97 (17.9)	73 (17.2)	9 (23.1)		
Female	192 (83.5)	446 (82.1)	352 (82.8)	30 (76.9)		
Education level, n (%)					69.927†	<0.001
Junior high school or below	152 (66.1)	236 (43.5)	159 (37.4)	8 (20.5)		
Senior high school	41 (17.8)	164 (30.2)	118 (27.8)	19 (48.7)		
College or above	37 (16.1)	143 (26.3)	148 (34.8)	12 (30.8)		
Duration of RA, n (%)					90.623†	<0.001
<2 years	46 (20.0)	155 (28.5)	165 (38.8)	19 (48.7)		
2–5 years	48 (20.9)	174 (32.0)	128 (30.1)	8 (20.5)		
6–10 years	37 (16.1)	102 (18.8)	72 (16.9)	7 (17.9)		
>10 years	99 (43.0)	112 (20.6)	60 (14.1)	5 (12.8)		
DAS28-ESR, mean \pm SD	5.17 \pm 1.82	4.35 \pm 1.59	3.47 \pm 1.51	3.11 \pm 2.11	143.545*	<0.001
DAS28-CRP, mean \pm SD	4.74 \pm 1.72	3.92 \pm 1.44	3.08 \pm 1.33	2.77 \pm 1.87	160.694*	<0.001
PtGA, mean \pm SD	5.66 \pm 2.55	4.62 \pm 2.24	3.3 \pm 2.34	2.59 \pm 2.88	142.756*	<0.001
Current medication, n (%)						
csDMARDs	189 (82.2)	448 (82.5)	365 (85.9)	35 (89.7)	3.496†	0.321
Glucocorticoids	109 (47.4)	215 (39.6)	153 (36.0)	11 (28.2)	10.259†	0.016
bDMARDs	41 (17.8)	104 (19.2)	52 (12.2)	5 (12.8)	9.111†	0.028
Communication with physicians, n (%)					12.056†	0.441
Full communication	145 (63.0)	350 (64.5)	296 (69.6)	27 (69.2)		
Good communication, but a little hasty	53 (23.0)	117 (21.5)	69 (16.2)	8 (20.5)		
Average communication level and can get the information	16 (7.0)	42 (7.7)	36 (8.5)	4 (10.3)		
Less communication with physicians	11 (4.8)	29 (5.3)	20 (4.7)	0		
Basically no communication	5 (2.2)	5 (0.9)	4 (0.9)	0		
Cost of treatment for RA, the proportion of household income, n (%)					123.569†	<0.001
<10%	36 (15.7)	102 (18.8)	119 (28.0)	17 (43.6)		
10–30%	56 (24.3)	203 (37.4)	175 (41.2)	8 (20.5)		
31–50%	37 (16.1)	136 (25.0)	84 (19.8)	7 (17.9)		
>50%	101 (43.9)	102 (18.8)	47 (11.1)	7 (17.9)		
Satisfaction toward general diagnosis and treatment services, n (%)					27.040†	0.078
Extremely satisfied	137 (59.6)	306 (56.4)	269 (63.3)	33 (84.6)		
Very satisfied	57 (24.8)	131 (24.1)	94 (22.1)	5 (12.8)		
Satisfied	16 (7.0)	58 (10.7)	35 (8.2)	0		
Somewhat satisfied	15 (6.5)	39 (7.2)	24 (5.6)	1 (2.6)		
Not quite satisfied	1 (0.4)	5 (0.9)	0	0		
Dissatisfied	2 (0.9)	0	1 (0.2)	0		
Extremely dissatisfied	2 (0.9)	4 (0.7)	2 (0.5)	0		

* F value. † χ^2 value. bDMARDs: Biological disease-modifying antirheumatic drugs; csDMARDs: Conventional synthetic disease-modifying antirheumatic drugs; DAS28-ESR: Disease activity score 28-erythrocyte sedimentation rate; DAS28-CRP: Disease activity score 28-C-reactive protein; IQR: Interquartile range; PtGA: Patient global assessment of rheumatoid arthritis disease activity; RA: Rheumatoid arthritis; SD: Standard deviation.

considering all medications, effectiveness, convenience, and global satisfaction scores were lower in the severe and moderate RA subgroups compared to those in the mild and extremely mild RA subgroups (all $P < 0.001$). For bDMARDs, effectiveness and convenience scores were lower in the severe RA subgroup compared to those in the extremely mild RA subgroup (both $P < 0.05$). No significant differences in side effects score for all medications, or side effects and global satisfaction scores for bDMARDs were observed among the subgroups.

Baseline characteristics of patients subgrouped by their proportion of treatment cost to household income

Then, the patients were subgrouped according to the proportion of income devoted to RA treatments. Table 3 shows that lower education level ($\chi^2 = 103.478, P < 0.001$), longer disease duration ($\chi^2 = 29.520, P = 0.001$), higher self-assessed disease severity ($\chi^2 = 123.569, P < 0.001$), more use of csDMARDs ($\chi^2 = 8.372, P = 0.039$), glucocorticoids ($\chi^2 = 14.851, P = 0.002$) and bDMARDs

Table 2: TSQM-II summary scores of patients with different self-assessed severity of rheumatoid arthritis.

Treatment	Severe (n = 230)	Moderate (n = 543)	Mild (n = 425)	Extremely mild (n = 39)	F	P
All medications						
n	230	543	425	39		
Effectiveness	74.74 ± 21.8 ^{*,†}	75.80 ± 20.31 ^{*,§}	82.29 ± 18.1	89.95 ± 13.81	44.540	<0.001
Side effects	90.69 ± 16.99	92.54 ± 15.65	93.86 ± 14.4	95.51 ± 10.27	7.390	0.060
Convenience	79.83 ± 18.56 ^{*,†,}	79.25 ± 16.85 ^{*,§,}	84.49 ± 15.66	91.52 ± 12.44	39.861	<0.001
Global satisfaction	73.84 ± 21.97 ^{*,†}	76.13 ± 19.33 ^{*,§}	80.55 ± 18.75 [¶]	89.32 ± 14.17	33.880	<0.001
bDMARDs						
n	66	169	90	10		
Effectiveness	69.70 ± 27.05 [†]	73.82 ± 25.35	78.33 ± 24.72	93.33 ± 11.65	11.075	0.011
Side effects	95.08 ± 14.09	93.93 ± 15.88	96.30 ± 11.86	100 ± 0	3.787	0.285
Convenience	71.04 ± 20.99 [†]	74.47 ± 21.23	75.85 ± 21.53	90.64 ± 12.57	9.834	0.020
Global satisfaction	70.33 ± 24.9	73.52 ± 23.01	75.09 ± 22.78	89.17 ± 17.59	6.623	0.085

Data are expressed as mean ± standard deviation. * P < 0.05, severe vs. mild. † P < 0.05, severe vs. extremely mild. ‡ P < 0.05, moderate vs. mild. § P < 0.05, moderate vs. extremely mild. || P < 0.05, all medications vs. bDMARDs. ¶ P < 0.05, mild vs. extremely mild. bDMARDs: Biological disease-modifying anti-rheumatic drugs.

($\chi^2 = 45.474, P < 0.001$), and better satisfaction toward general diagnosis and treatments ($\chi^2 = 37.338, P = 0.005$) were observed with the increase of financial burden, showing the significant differences among the subgroups. There were no significant differences in age, sex, and communication with physicians.

Satisfaction summary of patients with various proportion of treatment cost to household income

The TSQM-II summary scores of patients with different proportion of income devoted to RA treatments are shown in Table 4. When considering all medications, effectiveness, side effects, and convenience scores were higher in the < 10% subgroup compared to those in the > 50% subgroup (all P < 0.05). Global satisfaction score was higher in the < 10% subgroup than that in the 31–50% subgroup (F = 13.183, P = 0.004). For bDMARDs, convenience score was higher in the < 10% subgroup compared to that in the 31–50% and > 50% subgroups (F = 12.646, P = 0.005). Global satisfaction score was higher in the < 10% subgroup than that in the 31%–50% subgroup (F = 8.794, P = 0.032). There were no significant differences in effectiveness or side effects scores for bDMARDs among the subgroups.

Discussion

The status of patients’ satisfaction with treatments for RA is mostly unknown in China. Therefore, this study aimed to analyze satisfaction with drug therapies for RA according to the levels of disease severity (patient-assessed) and the proportion of treatment cost to household income. The results suggested that higher disease severity and higher costs of treatment relative to the household income were associated with lower patient satisfaction.

The data of the self-assessed disease severity showed that the majority of patients with severe disease had a duration of disease > 10 years and paid > 50% of their outcome for treatments. In contrast, the patients with extremely mild

RA had a duration of disease < 2 years and low treatment costs, supporting the concept that early management leads to better outcomes and smaller economic restraints. Similar results were obtained when grouping the patients according to the proportions of treatment cost to household income. Indeed, most patients with high treatment costs (> 50% of their income) had a duration of disease > 10 years. Some patients with a long duration of disease possibly did not receive early diagnosis and treatment, which might affect the overall prognosis in patients with long disease duration. These results are supported by the current T2T strategy that supports early treatment for the prevention of structural damage progression and for the optimization of quality of life.^[2,3] The results are also supported by a number of studies showed that the severity of RA is associated with healthcare costs in different populations around the globe.^[13–18]

Therefore, it is reasonable to seek treatments at an early stage of RA to achieve a better prognosis.^[2,3] Nevertheless, this concept of early diagnosis and treatment is not widely accepted in Chinese patients.^[19,20] In the present study, most patients had at least moderate or severe illness, but only 3.2% of all the patients enrolled were considering themselves as being with an extremely mild disease. High severity reported in most patients was possibly concerned with the fact that patients had low education levels in general and probably low levels of disease alertness, resulting in treatment delay.^[21] In addition, we cannot rule out the possibility that some patients from rural areas had difficulty in accessing medical resources, thereby leading to a delay before effective treatment, which potentially resulted in poor prognosis. This hypothesis will have to be confirmed in future studies.

In the present study, there was no significant difference in satisfaction with the side effects of different medications among patients with different disease severity. On the contrary, those with more severe illnesses tended to be more unsatisfied with the effectiveness and convenience of all drugs. Daniel *et al*^[22] showed that convenience was

Table 3: Characteristics of the patients with different proportion of treatment cost to household income.

Characteristic	<10% (n = 274)	10–30% (n = 442)	31–50% (n = 264)	>50% (n = 257)	F/ χ^2	P
Age (years), median (IQR)	49 (41, 59)	49 (40, 58)	50 (37, 57)	50 (42, 58)	0.703*	0.550
Sex, n (%)					3.655†	0.301
Male	50 (18.2)	78 (17.6)	37 (14.0)	52 (20.2)		
Female	224 (81.8)	364 (82.4)	227 (86.0)	205 (79.8)		
Education level, n (%)					103.478†	<0.001
Junior high school or below	99 (36.1)	160 (36.2)	123 (46.6)	173 (67.3)		
Senior high school	63 (23.0)	142 (32.1)	92 (34.8)	45 (17.5)		
College or above	112 (40.9)	140 (31.7)	49 (18.6)	39 (15.2)		
Duration of RA, n (%)					29.520†	0.001
<2 years	106 (38.7)	142 (32.1)	71 (26.9)	66 (25.7)		
2–5 years	66 (24.1)	137 (31.0)	92 (34.8)	63 (24.5)		
6–10 years	43 (15.7)	74 (16.7)	52 (19.7)	49 (19.1)		
>10 years	59 (21.5)	89 (20.1)	49 (18.6)	79 (30.7)		
Self-assessed severity of RA, n (%)					123.569†	<0.001
Severe	36 (13.1)	56 (12.7)	37 (14.0)	101 (39.3)		
Moderate	102 (37.2)	203 (45.9)	136 (51.5)	102 (39.7)		
Mild	119 (43.4)	175 (39.6)	84 (31.8)	47 (18.3)		
Extremely mild	17 (6.2)	8 (1.8)	7 (2.7)	7 (2.7)		
DAS28-ESR, mean ± SD	3.97 ± 1.85	4.04 ± 1.66	4.19 ± 1.71	4.52 ± 1.77	5.116*	0.002
DAS28-CRP, mean ± SD	3.58 ± 1.71	3.64 ± 1.51	3.76 ± 1.52	4.08 ± 1.64	4.997*	0.002
PtGA, mean ± SD	3.93 ± 2.61	4.31 ± 2.56	4.43 ± 2.31	4.48 ± 2.53	2.362*	0.070
Current medication, n (%)						
csDMARDs	235 (85.8)	377 (85.3)	206 (78.0)	219 (85.2)	8.372†	0.039
Glucocorticoids	90 (32.8)	162 (36.7)	125 (47.3)	111 (43.2)	14.851†	0.002
bDMARDs	19 (6.9)	70 (15.8)	40 (15.2)	73 (28.4)	45.474†	<0.001
Communication with physicians, n (%)					15.356†	0.223
Full communication	196 (71.5)	290 (65.6)	170 (64.4)	162 (63.0)		
Good communication, but a little hasty	52 (19.0)	87 (19.7)	58 (22.0)	50 (19.5)		
Average communication level and can get the information	15 (5.5)	39 (8.8)	20 (7.6)	24 (9.3)		
Less communication with physicians	8 (2.9)	21 (4.8)	16 (6.1)	15 (5.8)		
Basically no communication	3 (1.1)	5 (1.1)	0 (0)	6 (2.3)		
Satisfaction toward general diagnosis and treatment services, n (%)					37.338†	0.005
Extremely satisfied	187 (62.8)	256 (57.9)	130 (49.2)	172 (66.9)		
Very satisfied	58 (21.2)	104 (23.5)	75 (28.4)	50 (19.5)		
Satisfied	16 (5.8)	45 (10.2)	34 (12.9)	14 (5.4)		
Somewhat satisfied	11 (4.0)	31 (7.0)	20 (7.6)	17 (6.6)		
Not quite satisfied	0	4 (0.9)	1 (0.4)	1 (0.4)		
Dissatisfied	0	1 (0.2)	1 (0.4)	1 (0.4)		
Extremely dissatisfied	2 (0.7)	1 (0.2)	3 (1.1)	2 (0.8)		

* F value. † χ^2 value. bDMARDs: Biological disease-modifying antirheumatic drugs; csDMARDs: Conventional synthetic disease-modifying antirheumatic drugs; DAS28-ESR: Disease activity score 28-erythrocyte sedimentation rate; DAS28-CRP: Disease activity score 28-C-reactive protein; IQR: Interquartile range; PtGA: Patient global assessment of rheumatoid arthritis disease activity; RA: Rheumatoid arthritis; SD: Standard deviation.

a major determinant of patients' satisfaction with treatments for RA. De Mits *et al*^[23] showed that patient satisfaction was more dependent upon effectiveness than the route of administration. These results indicated that there was an urgent need to improve the effectiveness and convenience of RA treatment. In consideration of biological agents, a significant difference appeared in the satisfaction with efficacy and convenience only between the severe and extremely mild groups, suggesting that disease severity does not have a remarkable impact on the satisfaction with bDMARDs, as supported by previous studies.^[9,24] Nevertheless, more effective and

convenient bDMARDs are indeed required for patients with severe RA.

Among all patients, patients with <10% proportion of treatment cost to income were obviously more satisfied with all aspects of various medications, suggesting that the treatment costs were inevitably an important aspect of patient satisfaction, as supported by previous studies.^[25-27] A significant decrease in the satisfaction of Chinese patients was apparently correlated with expenditure increase. This could result in poor compliance and prognosis. This relationship between treatment costs,

Table 4: TSQM-II summary scores of the patients with different proportion of treatment cost to household income.

Treatment	<10% (n = 274)	10–30% (n = 442)	31–50% (n = 264)	>50% (n = 257)	F	P
All medications						
n	274	442	264	257		
Effectiveness	80.81 ± 19.08*	78.39 ± 20.01	75.82 ± 20.25	77.92 ± 20.71	8.629	0.035
Side effects	95.50 ± 12.1*	93.23 ± 14.55†	91.19 ± 17.65	90.56 ± 16.92†	13.446	0.004
Convenience	84.94 ± 16.27*,‡	82.27 ± 16.24†,§	77.49 ± 17.14†	80.83 ± 17.69†	30.113	<0.001
Global satisfaction	80.41 ± 19.09‡	78.15 ± 19.73	74.50 ± 20.14	77.04 ± 19.8	13.183	0.004
bDMARDs						
n	38	119	74	104		
Effectiveness	83.56 ± 22.96	74.16 ± 26.43	71.96 ± 25.11	74.36 ± 25.32	7.505	0.057
Side effects	91.01 ± 20.26	96.15 ± 11.88	94.37 ± 14.08	95.51 ± 14.36	2.716	0.437
Convenience	84.06 ± 21.43*,‡	75.07 ± 22.15	72.41 ± 18.79	72.31 ± 21.04	12.646	0.005
Global satisfaction	81.36 ± 24.84‡	74.58 ± 23.54	70.38 ± 22.67	72.52 ± 22.57	8.794	0.032

Data are expressed as mean ± standard deviation. * $P < 0.05$, <10% vs. >50%. † $P < 0.05$, all medications vs. bDMARDs. ‡ $P < 0.05$, <10% vs. 31–50%. § $P < 0.05$, 10–30% vs. 31–50%. bDMARDs: Biological disease-modifying anti-rheumatic drugs.

compliance, and prognosis has been reported by many populations all over the world.^[28–31] As for biologics, different satisfaction levels in the different treatment cost groups were only observed in the convenience aspect. It can be seen that increasing treatment costs will remarkably affect the compliance of Chinese patients on bDMARDs, thus affecting their therapeutic regimens and prognoses.

This study revealed the relationship between Chinese patients' satisfaction for RA treatment and their disease severity and treatment cost for the first time, which had great significance in improving patients' satisfaction and disease outcome. However, there is still room to improve this study. The sample size was not large enough, especially when considering the number of patients with RA in China. Second, disease severity and cost proportion were assessed by the patients, which could lead to a number of subjective biases. The DAS28 scores were determined and were associated with the patients' evaluation, but other scores such as the Health Assessment Questionnaire (HAQ) or the Sharp score were not determined. Third, as this was a cross-sectional study, the patients' evaluation was performed only once without follow up. Fourth, the questionnaire focused only on RA. Patients were asked about their satisfaction with their treatment for RA, and no question was asked about any other chronic disease. Based on a previous study from the CREDIT registry,^[4] the proportion of Chinese patients with RA with major comorbidities (cardiovascular diseases, fragility fracture, and malignancy) is low (4.2%). Therefore, it could be hypothesized that the influence of other chronic diseases on satisfaction might be small, but this will have to be confirmed. Fifth, the reliability and validity of the Chinese version of TSQM-II were not assessed. Finally, only bDMARDs and whole treatment were evaluated, and csDMARDs and glucocorticoids were not evaluated, as per study design. In addition, the results will have to be consistently revised as new drugs become available in China. Indeed, a recent trial in China demonstrated the efficacy and safety of tofacitinib in patients with RA,^[32] and future studies will have to be performed.

In conclusion, this study demonstrated that higher disease severity and higher costs of treatment relative to the household income were associated with lower patient satisfaction. These results improve our understanding of the satisfaction of Chinese patients with RA treatment and could be used to design new strategies to improve compliance and prognosis in patients with RA.

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Conflicts of interest

None.

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