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## Rheumatologists' beliefs about medication barely differ from patients' medication beliefs

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### ABSTRACT

Rationale, aims and objectives: Studies suggest that both healthcare providers' and patients' beliefs about medication influence medication adherence. This study aims to describe and compare rheumatologists' and patients' beliefs about medication.

Method: Data were collected in a specialized rheumatology clinic in The Netherlands. An adapted version of the Beliefs about Medicines Questionnaire (BMQ) was used to measure beliefs about medication in rheumatologists. (Dichotomized) scores on the BMQ of rheumatologists were compared to rheumatology patients' scores on the BMQ, using t-tests and two- group tests of proportions with 95% confidence intervals.

Results: Twenty-seven (96% of the eligible) rheumatologists (mean age 42 years, 63% female) and 580 (71% of the eligible) rheumatology patients (mean age 63 years, 68% female) were included. Generally, beliefs about medication did not differ between rheumatologists and patients. Both groups strongly perceived the need to take prescribed medication, but also had significant concerns about the long-term effects of the medication (63% of rheumatologists and 68% of patients expressed concerns). Some differences in beliefs were also present: Fewer rheumatologists worried about

the fact that patients have to take medicines (15% versus 44%, respectively) and about the possibility that patients become too dependent on the medicines (15% versus 30%, respectively).

Conclusions: This study indicates that, in general terms, rheumatologists' beliefs about medication barely differ from those of patients. However, in some respects, patients do have stronger concerns about medication than rheumatologists. Future research should focus on the interplay between rheumatologists' and patients' beliefs about medication and its impact on medication adherence.

## INTRODUCTION

Medication adherence is not optimal in patients with rheumatoid arthritis (RA) and varies from 22% (underuse) to 107% (overuse) [1-5]. As medication non-adherence can result in more disease activity, greater arthritic damage and a lower quality of life [6-8], effective interventions to improve medication adherence are warranted.

A useful target to improve medication adherence might be patients' beliefs about medication. In a meta-analysis, stronger perceptions about the necessity of the medication and fewer concerns about the harmfulness of the treatment were both associated with better medication adherence ( $OR_{\text{necessity}} = 1.7$ ,  $OR_{\text{concerns}} = 0.5$ ) [9]. In RA, necessity beliefs about medication were found to be among the most relevant, modifiable determinants of non-adherence [10].

While published studies tend to focus on the medication beliefs of patients only, emerging studies suggest that the medication beliefs of healthcare providers (HCPs) might influence medication adherence in addition. Some medication beliefs of doctors, nurses and pharmacists have been shown to be different from patients with a chronic disease (RA not included) and such differences might lead to misunderstandings and, hence, to increased medication non-adherence [11-17]. Regarding asthmatic patients, Driesenaar *et al.* [13], for example, showed that pharmacists had fewer concerns about inhaled corticosteroids than patients had themselves. In that case, pharmacists might be less inclined to elicit the specific concerns of patients (e.g., about side-effects, long-term effects, fear of dependency) that might be of importance to the patient and even act as a barrier to adherence and persistence [13].

Currently, sufficient evidence about the interplay between medication beliefs of HCPs and patients is still lacking in and outside the field of RA. As a first step toward gaining this knowledge and to set the research *agendum*, this study aimed to describe rheumatologists' medication beliefs and to compare these with the medication beliefs of RA patients. The results presented here may serve as a valuable input for future studies into this topic.

## METHODS AND MATERIALS

This descriptive study was approved by the local medical ethical board (CMO 2013/190) and is reported according to the STROBE guidelines [18].

### Design

#### *Rheumatologist data*

After signing informed consent forms, all rheumatologists, residents and physician assistants (henceforth referred to as 'rheumatologists') working in June 2013 at the Rheumatology Department of the Sint Maartenskliniek (a clinic specialized in rheumatology in The Netherlands) were asked to complete questionnaires.

### *Patient data*

Patient data were obtained from a cross-sectional study conducted at the Sint Maartenskliniek between September 2009 and September 2010 on beliefs about medication [19]. Inclusion criteria were having RA for at least one year, being  $\geq 18$  years old and using  $\geq 1$  prescribed disease-modifying antirheumatic drugs (DMARD). For further details, see Zwikker *et al.* [19].

### **Measures**

#### *Rheumatologists*

The *rheumatologist background variables* assessed were age, sex, work-related function and years of work experience within the field of RA.

The original, validated Beliefs about Medicines Questionnaire (BMQ) measures beliefs about medication in patients with a chronic disease. It consists of the BMQ 'specific' and the BMQ 'general'. The BMQ 'specific' has two scales, measuring patients' beliefs about the necessity of prescribed medication and their concerns about the potential adverse consequences of taking the medication. Items within scales are scored from 1 (strongly disagree) to 5 (strongly agree) [20,21].

The BMQ 'general' assesses general beliefs about pharmaceuticals as a class of treatment [22] and also has two scales. The 'overuse' scale includes beliefs about the way in which medicines are endorsed by doctors. The 'harm' scale includes beliefs about the potential of medication to harm. To obtain scale scores, items within the scale are averaged and no missing items are allowed. Higher scores indicate stronger beliefs [20].

To make the original BMQ suitable for rheumatologists, all items were converted to the rheumatologists' perspective. Hereby, the original formulation of the BMQ items was retained as much as possible to be able to compare the rheumatologists' beliefs with the patients' beliefs. The conversion was discussed between HZ, NL and the developer of the BMQ (RH) and subsequently approved by all the other co-authors of this study.

#### **Patients**

The *patient background variables* assessed were age, sex, living with others (yes/no), educational level (high/not high), employment/studying (yes/no), disease duration and the type and number of DMARDs used. Beliefs about medication were measured using the original BMQ (see above).

The internal consistency of all BMQ scales was sufficient in the patient population: Cronbach's alpha varied from 0.69 to 0.84. However, the internal consistency of the scales

was poor for the rheumatologist population, as Cronbach's alpha varied from 0.47 to 0.57 [23].

## Data analyses

The scores of the BMQ subscales were described using means and standard deviations. The scores on single items were described using medians and interquartile ranges (see Appendix). The differences in the means between rheumatologists and patients were examined using t-tests. Subsequently, single items were dichotomized above the scale midpoint ( $>3$ , so '1' when scoring 'agree' or 'strongly agree' and '0' if not) to compare the strength of views about medication among rheumatologists and patients. Differences in percentages were examined using two-group tests of proportions. Confidence intervals were set at 95% and analyses were based on complete cases and were performed in STATA10.

## RESULTS

### Participants

Twenty-seven out of 28 rheumatologists employed at the Sint Maartenskliniek in June 2013 completed the questionnaires (Table 1). Patients' characteristics are shown in Table 2.

## RESULTS

### [TABLE 3]

Table 3 shows the (dichotomized) BMQ scores and the differences between rheumatologists and patients along with a 95% confidence interval. Medians and interquartile ranges for single items are displayed in the Appendix.

### Rheumatologists' beliefs about medication

In general, rheumatologists had a strong perceived need for patients to take their medication (mean 3.9, SD 0.4). Their concern beliefs were not as strong as their necessity beliefs (mean 2.7, SD 0.5). Nevertheless, 63% of the rheumatologists were concerned about the long-term effects of the medication and 44% about unpleasant side-effects. When examining beliefs about 'medication in general,' rheumatologists generally did not believe that medicines have much potential to harm or that physicians over use medication. Nevertheless, 19% of the rheumatologists (strongly) agreed with the statement: 'Doctors prescribe too many medicines.'

### Comparison of medication beliefs between rheumatologists and patients

The beliefs of rheumatologists and patients about medication did not differ on a scale level, except for general harm beliefs (the rheumatologists were less concerned than the patients about the potential of medicines to harm).

Although both rheumatologists and patients had a strong perceived need for patients to take medication as prescribed, fewer rheumatologists agreed with the statement 'My patients' life would be impossible without the medicines' (41%, compared to 83% of patients). Also, a lower percentage of rheumatologists worried (15% of rheumatologists *versus* 44% of patients) about the fact that patients have to take medicines in the first place and about patients becoming too dependent on medicines (respectively, 15% *versus* 30%).

## DISCUSSION

The present study illustrates that rheumatologists' beliefs about medication barely differ from those of patients. Rheumatologists and patients had a stronger perceived need for patients to take medication as prescribed than concerns about taking medication, *per se*, although the majority of both groups had concerns about the long-term effects of medication.

### [TABLE 3]

We found some differences in medication beliefs between both groups. Rheumatologists appeared less concerned about the potential of medicines to harm. Furthermore, patients believed more strongly that life without medicines would be impossible and had stronger concerns about having to take medicines and about being dependent on them.

The finding that rheumatologists' perceived medication beliefs 'in general' were less harmful than patients' beliefs is in line with the findings of two other studies assessing general medication beliefs using the BMQ among doctors, nurses and pharmacists [15,17]. The HCPs in these studies also perceived medication 'in general' to be less harmful than patients did. This difference in attitude between HCPs and patients might be explained by the fact that it is the patient who has to deal with the burden of using medicines in daily life and not the HCP [24].

One major characteristic of the current study is that it is the first to describe rheumatologists' beliefs about medication and to describe *specific* beliefs about medication among *physicians* according to an adapted version of the Beliefs about Medicines Questionnaire. Nevertheless, a limitation of this study was the poor internal consistency of the BMQ scales for the rheumatologist sample. Two other studies assessing medication beliefs in HCPs also reported low to moderate Cronbach's alpha values [14,17]. Because of their knowledge about RA medication, the rheumatologists may be considered to possess more subtle or other beliefs about medication use and adherence and thus might have more/other factors when considering the current BMQ statements. Thus, our current version of the BMQ for rheumatologists might not be specific enough and more research into this topic is therefore indicated. A further, possible limitation of the current study is the three-year time period between measurements within the patient dataset and the rheumatologist dataset. Medication beliefs might change over time [25,26] and so it is possible that our results would have been different if we had used a synchronous cross-sectional study design. However, given that *general* medication beliefs have been found to be stable over a four-year period, irrespective of changes in health [27], it is not certain that this time lag has biased our results.

Finally, a limitation of the present study is that we compared medication beliefs on a group level between rheumatologists and patients. Using this approach, true differences in beliefs between *pairs* of rheumatologists and patients could not be detected. Furthermore, medication adherence *per se* was not assessed.

## Conclusion

The current study was conducted specifically in order to set the research *agendum*. We therefore conclude that our results can serve valuably as an important input in guiding future research in which the deficiencies we detail and discuss can be obviated to examine the effect of rheumatologists' medication beliefs (and the interplay with patients' beliefs) on patients' medication adherence.

## Conflicts of Interest

We declare no conflicts of interest.

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## TABLES AND APPENDIX

Table 1 Sample characteristics of the rheumatologists (n=27)\*

Background variables	Descriptives
Age in years (mean, SD)	42 (9.7)
Female	17 (63%)
Work-related function	
Rheumatologists Residents	21 (78%)
Physician assistants	4 (15%) 2 (7%)
Work experience in years (median, IQR)	5 (3-10)

\* Data are means (SD), medians (interquartile range), or numbers (%)

Table 2 Sample characteristics of the patients\*

Background variables	Number of patients providing data	Descriptives
Age in years (mean, SD)	580	62.8 (12.6)
Female	580	396 (68%)
Living with others (yes)	571	458 (80%)
Higher education†	571	106 (19%)
Currently employed or studying (yes)	552	216 (39%)
Disease duration in years (median, IQR)	556	14 (8–22)
Number of DMARDs used		
DMARD	476	307 (65%)
DMARDs	476	149 (31%)
DMARDs	476	20 (4%)
Route of DMARD administration		
Oral ‡	476	272 (57%)
Parenteral §	476	296 (62%)

\* Data are means (SD), medians (interquartile range), or numbers (%).

† Higher education means having at least a bachelor master's degree.

‡ Azathioprine, hydroxychloroquine, leflunomide, methotrexate, predniso(lo)n, or sulfasalazine.

§ Abatacept, adalimumab, aurothiomalate, etanercept, methotrexate, methylprednisolon, infliximab, rituximab, or tocilizumab.



**Table 3 (Differences in) BMQ scores between rheumatologists and patients**

Mean (SD) (scale level) / percentage scoring above scale midpoint (item level)\*

	Rheumatologists (n=27)	Patients (n=531-565) <sup>†</sup>	Difference (95% CI) <sup>‡</sup>
<b>Necessity beliefs about medication</b>			
<i>Mean (SD) (scale level)</i>	3.9 (0.4)	4.0 (0.7)	-0.1 (-0.3 to 0)
<i>Percentage scoring above scale midpoint (item level)</i>			
My patients'/my health, at present, depends on the medicines	96	81	16 (8 to 23) <sup>§</sup>
My patients'/my life would be impossible without the medicines	41	83	-43 (-61 to -24) <sup>¶</sup>
Without the medicines my patients/I would be very ill	78	67	11 (-5 to 27)
My patients'/my future health will depend on the medicines	89	78	11 (-2 to 23)
The medicines protect my patients/me from becoming worse	100	84	16 (13 to 19) <sup>§</sup>
<b>Concern beliefs about medication</b>			
<i>Mean (SD) (scale level)</i>	2.7 (0.5)	2.9 (0.7)	-0.2 (-0.4 to 0)
<i>Percentage scoring above scale midpoint (item level)</i>			
It worries me that my patients/I have to take medicines	15	43	-29 (-43 to -15) <sup>¶</sup>
I sometimes worry about long-term effects of the/my medicines	63	68	-5 (-24 to 13)
I have insufficient knowledge about the effects of the medicines	19	23	-4 (-19 to 11)
These/my medicines disrupt my patients'/my life	7	10	-2 (-13 to 8)
I sometimes worry that my patients/I become too dependent on	15	30	-15 (-29 to -1)
These medicines give my patients/me unpleasant side effects	44	30	14 (-5 to 33)
<b>Harm beliefs</b>			
<i>Mean (SD) (scale level)</i>	1.7 (0.5)	2.6 (0.6)	-0.8 (-1.0 to -0.6) <sup>¶</sup>
<i>Percentage scoring above scale midpoint (item level)</i>			
People who take medicines should stop their treatment for a	7	17	-9 (-20 to 1)
Most medicines are addictive	4	13	-9 (-17 to -1)
Natural remedies are safer than medicines	0	18	-18 (-21 to -15) <sup>¶</sup>
Medicines do more harm than good	0	7	-7 (-9 to -5)
All medicines are poisons	7	22	-14 (-25 to -4)
<b>Overuse beliefs</b>			
<i>Mean (SD) (scale level)</i>	2.5 (0.6)	2.6 (0.7)	-0.1 (-0.3 to 0.2)
<i>Percentage scoring above scale midpoint (item level)</i>			
Doctors prescribe too many medicines <sup>¶</sup>	19	10	8 (-7 to 23)
Doctors place too much trust on medicines	7	15	-8 (-18 to 2)
If doctors had more time with patients they would prescribe	19	15	4 (-11 to 19)

\* 1 = Strongly disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, 5 = Strongly agree. <sup>†</sup> Of the 580 patients included in the cross-sectional study, between 531 and 565 provided data on the BMQ items <sup>‡</sup>

Differences in means (scale level) or percentages (item level): rheumatologist score minus patient score. <sup>§</sup> p ≤ 0.05 <sup>¶</sup> p ≤ 0.01 <sup>¶</sup> Adapted item: original item is 'Doctors use too many medicines.'

## Appendix

### Outcome scores on the BMQ items: medians and interquartile ranges

	Rheumatologists (n=27)	Patients (n=531- 565)*
	Median, IQR <sup>†</sup>	Median, IQR <sup>†</sup>
<u>Necessity beliefs about medication</u>		
My patients'/my health, at present, depends on the medicines	4 (4-4)	4 (4-5)
My patients'/my life would be impossible without the medicines	3 (2-4)	4 (4-5)
Without the medicines my patients/I would be very ill	4 (4-4)	4 (3-5)
My patients'/my future health will depend on the medicines	4 (4-4)	4 (4-4)
The medicines protect my patients/me from becoming worse	4 (4-5)	4 (4-5)
<u>Concern beliefs about medication</u>		
It worries me that my patients/I have to take medicines	2 (2-3)	3 (2-4)
I sometimes worry about long-term effects of the/my medicines	4 (3-4)	4 (3-4)
I have insufficient knowledge about the effects of the medicines	2 (1-2)	2 (2-3)
These/my medicines disrupt my patients'/my life	2 (2-3)	2 (2-2)
I sometimes worry that my patients/I become too dependent on the medicines	2 (2-3)	3 (2-4)
These medicines give my patients/me unpleasant side effects	3 (3-4)	3 (2-4)
<u>Harm beliefs</u>		
People who take medicines should stop their treatment for a while every now and again	2 (1-2)	2 (2-3)
Most medicines are addictive	2 (1-2)	2 (2-3)
Natural remedies are safer than medicines	2 (1-2)	3 (2-3)
Medicines do more harm than good	1 (1-2)	2 (2-3)
All medicines are poisons	1 (1-2)	3 (2-3)
<u>Overuse beliefs</u>		
Doctors prescribe too many medicines <sup>‡</sup>	3 (2-3)	2 (2-3)
Doctors place too much trust on medicines	2 (2-2)	3 (2-3)
If doctors had more time with patients they would prescribe fewer medicines	3 (2-3)	3 (2-3)

\* Of the 580 patients included in the cross-sectional study, between 531 and 565 provided data on the BMQ items.

<sup>†</sup> Data shown are medians with their interquartile range (IQR). 1 = Strongly disagree, 2 = Disagree, 3 = Uncertain, 4 = Agree, 5 = Strongly agree.

<sup>‡</sup> Adapted item: original item is 'Doctors use too many medicines.'