cogent
medicine

RHEUMATOLOGY | RESEARCH ARTICLE

Preference for shared decision-making in Japanese patients with rheumatoid arthritis

Jörg Mahlich[1,2]* and Rosarin Sruamsiri[1,3]

*Corresponding author: Jörg Mahlich, Department of Health Economics, Janssen Pharmaceutical KK, 5-2, Nishi-kanda 3-chome Chiyoda-ku, Tokyo 101-0065, Japan; Düsseldorf Institute for Competition Economics (DICE), University of Düsseldorf, Düsseldorf, Germany
E-mail: joerg.mahlich@gmail.com

Abstract: *Purpose*: The goal of this study was to examine preference for collaborative decision-making in Japanese patients with rheumatoid arthritis (RA). *Patients and methods*: A national online survey identified five hundred Japanese patients with RA who met study eligibility criteria. Subjects were queried regarding their preference for shared decision-making (SDM), using a questionnaire developed by Baars et al. to evaluate preference for SDM among Dutch patients. Participants in this study were asked to identify a number of clinical and socioeconomic characteristics, medical history, and treatment details. Multivariable regression analyses were applied to determine factors that were related to patient preference for SDM. *Results*: The study showed that 52% of patients surveyed considered shared medical decision-making "Very important" on a 4-item Likert scale. Females and patients with RA in Japan who are treated with biologic agents are more likely to have a preference for SDM. On the other hand, patients with a comorbidity of depression are less likely to prefer SDM. *Conclusion*: A majority of Japanese patients with RA prefer a collaborative role in medical decision-making. Treatment with biologic agents is associated with a higher likelihood of preference for SDM.

Subjects: Quality of Life; Health Communication; Rheumatology

Keywords: decision-making; patient preference; rheumatoid arthritis; biological products

ABOUT THE AUTHORS

Jorg Mahlich and Rosarin Sruamsiri are health economists at Janssen Japan, where they conduct projects on health economics and outcomes research. Health Technology Assessment and value based pricing of pharmaceuticals are also part of their research agenda.

PUBLIC INTEREST STATEMENT

Conventional wisdom says that physicians in Japan are less prepared to involve patients in treatment decisions because Japanese patients prefer to adopt a rather passive approach to health care counseling. However, our study on preferences for shared decision-making of Japanese patients with rheumatoid arthritis reveals that the vast majority of Japanese patients prefer a collaborative decision-making process with their physician. This preference was marked in patients treated with a biologic agent. The study also suggests that patients who bear a larger cost burden, such as those patients with lower annual household income, are more interested in SDM. The results of the study provide fertile ground for further research about SDM that will improve persistence and subsequent positive outcomes.

cogent··oa

cogent ••medicine

1. Introduction

Shared decision-making (SDM) is the process of interaction with patients who wish to be involved with their healthcare providers in making medical decisions. This concept is increasingly being embraced by the healthcare community (Smith, Pandit, Rush, Wolf, & Simon, 2016). There has also been a recent emphasis on the importance of patient participation in the decision-making process among patients with rheumatoid arthritis (RA) who are initiating treatment with a biologic; a need was identified for more open communication about treatment options, which may encourage a more appropriate, timely transition to biologic therapy (Bolge, Goren, Brown, Ginsberg, & Allen, 2016). These discussions are most often initiated by the patient's rheumatologist (Kalkan, Roback, Hallert, & Carlsson, 2014). An effective line of communication during the SDM process has been linked to improved patient satisfaction and better adherence to therapy (Lindhiem, Bennett, Trentacosta, & McLear, 2014). Current recommendations for treatment of patients with RA prioritize the need for SDM between patient and rheumatologist (Singh et al., 2016; Smolen et al., 2014). It was argued that this process includes the need to inform patients of the risks of RA and the benefits of achieving a reduction of disease activity, in addition to clearly communicating the benefits and risks of proposed therapies. It is crucial that communication flows both ways during the process, and decisions about both the therapeutic target and management plan are made jointly. The SDM process is incomplete without support for patient preferences. Patients need reassurance and support during the entire process. At the same time, when offering patients an option to participate in their medical decision-making, it is important to consider that a percentage of patients will prefer a paternalistic model, in which the physician has a dominant attitude over the patient (Counlter, 2007; Coulter, Parsons, & Askham, 2008; Friedrichs, Spies, Harter, & Buchholz, 2006).

Many recent studies indicate that patients in the United States prefer to be involved in decisions concerning their treatment, resulting in improved compliance with the treatment regimen and improved clinical outcomes for patients (Alden & Akashi, 2012; Chan & Ahmad, 2012; Degner & Venkatesh, 1997; Flynn, Smith, & Vanness, 1982; Giordano et al., 2008; O'Donnell & Hunskaar, 2007b). Studies in Europe have demonstrated similar results (Baars, Markus, Kuipers, & van der Woude, 2010; O'Donnell & Hunskaar, 2007a; Shields et al., 2004). There is less available evidence on patient preference for SDM and the associated effects on health outcomes among Japanese patients, although some evidence suggests that Japanese patients prefer to remain outside the decision-making process when a life-threatening condition is involved, including cancer (Narumi et al., 1998; Singh et al., 2016).

An early study conducted in Japan in 1996 found that Japanese patients play a passive role during consultations. This study showed that older patients (≥65 years of age) trusted their doctors to make treatment decisions (Narumi et al., 1998). Another study in the Japanese context confirmed that young patients favored patient-centered care for less serious disease conditions (Alden & Akashi, 2012). A recent study in 2004 in Kyoto examined 134 diabetic subjects at a single outpatient clinic who were randomly assigned to vignettes consisting of pneumonia, gangrene, or cancer (Sakimoto et al., 2004). The majority of study subjects across all sets were likely to prefer a collaborative role (71%), followed by a passive role (17%) or an active role (12%). This study suggested a split between age groups, with younger patients more likely to favor patient-centered care for less serious disease conditions, and older patients (65 years or older) more likely to trust their doctor to make important medical decisions. Those individuals who participated in the cancer vignette were less likely to prefer an active role, but were also more likely to want their family to participate in the decision-making process. This study demonstrated a tendency toward collaborative decision-making in patients who may have previously preferred a more paternalistic approach.

cogent··medicine

Another more recent study in 2010 focused on SDM preferences in Japanese RA patients. This study found a preference for a collaborative role among Japanese RA patients. The study results showed that the passive role was preferred by 38.4% of patients, while 61.6% expressed preference for a collaborative role. Interestingly, none of the patients who participated in the study preferred an active role in which the ultimate treatment decision would be made by the patient. Multivariate analysis demonstrated that younger age and not-housewife status were associated with high preferences for SDM (Aoki et al., 2013).

While Japanese medical patients have traditionally allowed their physician to have authority over their treatment (Alden & Akashi, 2012), there has been an apparent shift noted in recent studies that suggests a trend towards increasing preference for autonomous, active, or collaborative participation; compared to previous studies that suggested Japanese patients preferred a more passive role in their medical treatment decisions (Tariman, Berry, Cochrane, Doorenbos, & Schepp, 2010). The apparent change in patient preference among Japanese patients, favoring a more active decision-making role, should be examined closely.

With the availability of many new treatment options, particularly in the field of biologics, patient preferences are important, in light of evidence that suggests patient participation in treatment decision-making is linked to greater compliance, which in turn leads to better clinical outcomes. Basically, two medical treatment strategies are available in treatment of RA. Conventional disease-modifying anti-rheumatic drugs (DMARDs) such as methotrexate (MTX), sulfasalazine (SSZ), leflunomide (LEF), or tacrolimus (TAC) which are generically available and inexpensive. Alternatively, biologic DMARDs have been available since the late 1990s, and effectively delay or even prevent the clinical disease progression of RA (Smolen et al., 2010). Also, treatment with biologics can improve productivity and help people to stay in employment (Furuya et al., 2013). However, treatment costs of biologics are more than 20 times higher. The use of biologics for treatment of rheumatoid arthritis more than doubled in Japan between 2011 and 2014 (Mahlich & Sruamsiri, 2016a).

Moreover, with information readily available on the Internet, and with generational shifts and other social and cultural changes over the past decade, it is important to reassess the preferences of Japanese RA patients in relation to SDM in order to optimize patient satisfaction and clinical outcomes. Against this backdrop, our study objective is to determine the preferred role in the medical decision-making process among Japanese patients with rheumatoid arthritis and to determine what factors influence any differences in patient preferences.

2. Methods

2.1. Patient selection
The study identified 1000 Japanese patients with rheumatoid arthritis by a nationwide online survey in July and August of 2016. Five hundred patients who responded met the study eligibility criteria of (1) diagnosis of rheumatoid arthritis for at least one year and (2) currently receiving at least one medication for treatment of rheumatoid arthritis.

2.2. Variables
Patients were asked to identify basic clinical characteristics, socioeconomic status, and medical history. Clinical characteristics considered included (1) age, (2) gender, and (3) diagnosis. Socioeconomic characteristics considered included (1) marital status, (2) household income, (3) educational level, and (4) work status. Medical history characteristics were recorded, including (1) time since diagnosis, (2) surgical history, and (3) comorbidity. Treatment details included (1) current treatment, (2) type of hospital, and (3) frequency of visits.

Current treatment was classified into conventional disease-modifying anti-rheumatic drugs (DMRADs) such as methotrexate, sulfasalazine, leflunomide, or hydroxychloroquine; biologic agents (biologics) which are classified according to molecules they target such as tumor necrosis factor inhibitors or, more recently, Janus kinase inhibitors, interleukin-6, interleukin-1, B-cell and T-cell co-stimulation inhibitors; and a combination of both classes (DMARDs + biologics) (Mahlich & Sruamsiri, 2016b).

Disease severity was measured using the J-HAQ (Japanese-Health Assessment Questionnaire), a validated Japanese version of the Stanford Health Assessment Questionnaire used to measure the severity of disease in patients with RA (Matsuda et al., 2003). This questionnaire assesses relevant function in 8 categories, including: dressing and grooming, arising, eating, walking, hygiene, reach, grip, and activities.

A Japanese language version of the PHQ-9 (Patient Health Questionnaire-9) scale was used as a clinical measurement of depression. This scale has been validated for screening for depression in Japanese hospitals (Suzuki, Kumei, Ohhira, Nozu, & Okumura, 2015). Cut-off scores used to measure depression were: minimal (0–4); mild (5–9); and moderate to severe (≥10).

Patients were questioned regarding their preference for SDM using a questionnaire originally developed by Baars et al. (2010). This questionnaire, used to measure preference for SDM in Dutch patients, was translated independently by two native Japanese speakers. Validation of the quality and essence capture of the original questionnaire was performed by reconciliation of the two translations into a single questionnaire, which was then translated back into English by a native English speaker.
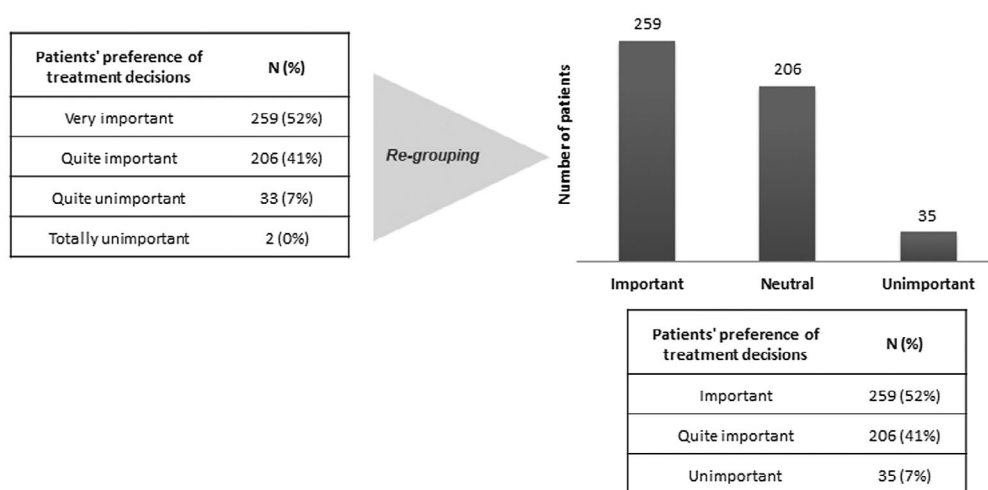
2.3. Outcomes
The questionnaire asked patients to answer questions about the importance of involvement in SDM with their physician, using a 4-point Likert scale with the following responses: (1) very important; (2) quite important; (3) quite unimportant; and (4) totally unimportant. In order to increase the statistical power of the study and to get a more balanced distribution, the categories were further refined to three dimensions: important (1); quite important (2); and unimportant (3 and 4).

2.4. Statistical analysis
Descriptive statistics were used to determine the differences in the level of importance of SDM between the three groups. We then explored the association between decision-making preference and patient characteristics using univariable ordinal logistic regression. Following the approach of a recent study on treatment satisfaction in patients with inflammatory bowel diseases (Mahlich, Matsuoka, & Sruamsiri, 2017), variables with significant differences at the 0.2 level or better were selected to be included as explanatory variables in a full multivariable ordered logistic regression model with SDM as the dependent categorical variable. In our specification, the answer "important" received the highest code (3) and "unimportant" the lowest (1). Therefore, the resulting coefficients can be interpreted as the log odds of preferring a more active decision-making style

The Stata® statistics package (College Station, TX, USA) was used for analysis of the results. A value of $p < 0.05$ was defined as significant in the final model.

Figure 1. Distribution of the patients' preference for shared decision-making.

Patients' preference of treatment decisions	N (%)
Very important	259 (52%)
Quite important	206 (41%)
Quite unimportant	33 (7%)
Totally unimportant	2 (0%)

Re-grouping

Patients' preference of treatment decisions	N (%)
Important	259 (52%)
Quite important	206 (41%)
Unimportant	35 (7%)

3. Results

A total of 500 Japanese patients with rheumatoid arthritis participated in the survey. The majority (52%) considered SDM in treatment decisions "very important" while only two respondents valued SDM totally unimportant (Figure 1).

Table 1 reports the patient characteristics of the sample. The survey population was majority female with a mean age of 54 years across all groups. Mean time since diagnosis was 10.67 years with an average HAQ score of 0.40. Those patients with longer time since diagnosis and/or higher disease severity had a non-significant trend towards higher preference for SDM. The most common comorbid condition among respondents was hypertension (16%). The primary treatment for 66% of patients surveyed was a DMARD.

Results from the descriptive statistics suggest significant differences at the 0.05 level with regard to gender. Female patients have a stronger preference for SDM compared to male patients. Also, significant differences were found with regard to the HAQ score: the higher the HAQ score, the more a patient wants to be involved. Recall that a higher HAQ score indicates poorer functioning. We also found that those patients who are treated with a biologic have a greater preference for SDM compared with those patients that are on a conventional DMARD.

The results of both the univariable and multivariable ordered logistic regression are reported in Table 2. In the final model, female gender was a strong predictor of a higher preference for SDM (OR 1.74, CI 1.09 – 2.77). It was further confirmed that patients treated with a biologic agent were most likely to prefer collaborative medical decision-making (OR 2.00, CI 1.09 – 3.69). A negative impact on preference for SDM was found for patients who have a comorbidity of moderate to severe depression (OR 0.54, CI 0.30 – 0.99), and for those working only part time (OR 0.50, CI 0.28 – 0.89).

cogent··medicine

Table 1. Patient characteristics by patients' preference (3 levels)

Characteristics	Overall	Unimportant	Quite important	Important	*p*-value
Patients, N (%)	500	35 (7)	206 (41)	259 (52)	
Age (mean ± SD)	54.28 ± 10.02	54.60 ± 11.80	53.29 ± 9.18	55.01 ± 10.36	0.062
≤50 years, N (%)	178	12 (7)	77 (43)	89 (50)	
51–60 years, N (%)	196	10 (6)	89 (45)	97 (49)	
>60 years, N (%)	126	13 (10)	40 (32)	73 (58)	
Gender					0.017
Male, N (%)	163	19 (12)	65 (40)	79 (48)	
Female, N (%)	337	16 (5)	141 (42)	180 (53)	
Marriage status					0.307
Single, N (%)	97	10 (10)	41 (42)	46 (48)	
Married, N (%)	403	25 (6)	165 (41)	213 (53)	
Highest education					0.726
High school or less, N (%)	180	16 (9)	76 (42)	88 (49)	
College, N (%)	120	7 (6)	50 (42)	63 (52)	
Bachelor's degree or higher, N (%)	200	12 (6)	80 (40)	108 (54)	
Occupation					0.125
Fulltime, N (%)	164	11 (7)	70 (43)	83 (50)	
Part-time, N (%)	78	6 (8)	41 (52)	31 (40)	
Self-employed, N (%)	37	4 (11)	10 (27)	23 (62)	
House wife, N (%)	141	6 (4)	57 (40)	78 (56)	
Retired, N (%)	20	2 (10)	3 (15)	15 (75)	
Unemployed, N (%)	57	6 (10)	33 (58)	28 (32)	
Others, N (%)	3	0 (0)	2 (67)	1 (33)	
Region					
Hokkaido, N (%)	26	3 (11)	9 (35)	14 (54)	0.572
Tōhoku, N (%)	23	1 (4)	11 (48)	11 (48)	0.751
Kanto, N (%)	230	17 (7)	99 (43)	114 (50)	0.652
Chubu, N (%)	63	2 (3)	24 (38)	37 (59)	0.310
Kansai, N (%)	95	6 (7)	39 (41)	50 (52)	0.954
Chugoku, N (%)	21	3 (14)	10 (48)	8 (38)	0.262
Shikoku, N (%)	11	1 (9)	2 (18)	8 (73)	0.291

(Continued)

Table 1. (Continued)

Characteristics	Overall		Unimportant		Quite important		Important		p-value
	H*	I^s	H*	I^s	H*	I^s	H*	I^s	
Kyushu, N (%)	31		2 (6)		12 (42)		17 (52)		0.940
Annual income									
<3.7 M Yen, N (%)	130	286	11 (8)	20 (7)	49 (38)	123 (43)	70 (54)	143 (50)	
3.7–7.7 M Yen, N (%)	164	105	9 (5)	7 (6)	67 (40)	43 (40)	88 (55)	55 (54)	
>7.7 M Yen, N (%)	101	45	9 (8)	5 (11)	46 (45)	20 (44)	46 (47)	20 (45)	
I don't know, N (%)	105	64	6 (5)	3 (4)	44 (41)	20 (31)	55 (54)	41 (65)	
Time since diagnosis (mean ± SD)	10.67 ± 8.63		9.60 ± 8.49		9.98 ± 8.48		11.37 ± 8.73		0.166
≤5 years, N (%)	165		13 (7)		77 (46)		75 (47)		
6–10 years, N (%)	146		11 (7)		64 (43)		71 (50)		
>10 years, N (%)	189		11 (5)		65 (34)		113 (61)		
HAQ score (mean ± SD)	0.40 ± 0.81		0.31 ± 0.57		0.34 ± 0.68		0.46 ± 0.92		<0.001
Comorbidity									
Hypertension, N (%)	79		6 (7)		38 (48)		35 (45)		0.341
High cholesterol, N (%)	42		1 (2)		21 (50)		20 (48)		0.299
Diabetes, N (%)	26		2 (7)		8 (30)		16 (63)		0.537
Depression, N (%)	25		4 (16)		9 (36)		12 (48)		0.193
Migraines, N (%)	11		1 (10)		5 (45)		5 (45)		0.902
Heart condition, N (%)	8		1 (12)		2 (25)		5 (63)		0.592
Anxiety, N (%)	8		1 (12)		3 (37)		4 (51)		0.826
Depression condition									0.130
No depression, N (%)	324		20 (6)		122 (37)		182 (57)		
Mild depression, N (%)	118		10 (8)		56 (47)		52 (45)		
Moderate to severe depression, N (%)	58		5 (8)		28 (48)		25 (44)		
Current medication									
Pain killer (NSAIDs/oral pain med), N (%)	80		6 (7)		30 (37)		44 (56)		0.764
Steroid, N (%)	110		9 (8)		34 (30)		67 (62)		0.046
RA-related treatment									
DMARDs, N (%)	329		27 (8)		152 (46)		150 (46)		0.003
DMARDs + biologic agent, N (%)	113		7 (6)		36 (31)		70 (63)		
Biologic agent, N (%)	58		1 (1)		18 (31)		39 (68)		

Notes: SD: standard deviation, M: million, H: household, I: individual, HAQ: health activity questionnaire, NSAID: non-steroidal anti-inflammatory drug, RA: rheumatoid arthritis, DMARDs: disease modifying anti-rheumatic drugs.

*One-way ANOVA for annual household income: *p* = 0.736.

§One-way ANOVA for annual individual income: *p* = 0.425.

Table 2. Factor affecting the current patients' preference to SDM in Japanese RA patients				
Characteristics	**Univariate analysis**		**Multivariate analysis**	
	ORs (95% CI)	***p*-value**	**ORs (95% CI)**	***p*-value**
Age (Reference: ≤50 years)				
51–60 years	**1.01 (0.68 – 1.50)**	0.095	0.93 (0.62 – 1.41)	0.745
> 60 years	1.25 (0.79 – 1.97)	0.333	1.05 (0.62 – 1.79)	0.845
Gender (reference: male)				
Female	**1.36 (0.94 – 1.96)**	0.102	**1.74 (1.09 – 2.77)**	0.020
Marital status (reference: single)				
Married	1.31 (0.85 – 2.01)	0.223		
Highest education (reference: high school or less)				
College	1.20 (0.77 – 1.88)	0.424		
Bachelor's degree or higher	1.26 (0.85 – 1.87)	0.243		
Occupation (reference: full-time)				
Part-time	**0.68 (0.41 – 1.14)**	0.144	**0.50 (0.28 – 0.89)**	0.020
Self employed	1.43 (0.69 – 2.98)	0.333	1.37 (0.64 – 2.94)	0.420
House wife	1.23 (0.80 – 1.91)	0.347	0.77 (0.44 – 1.32)	0.339
Retired	2.62 (0.90 – 7.59)	0.076	2.48 (0.78 – 7.92)	0.124
Unemployed	0.88 (0.49 – 1.59)	0.675	0.70 (0.36 – 1.34)	0.282
Others	0.65 (0.08 – 5.22)	0.688	0.77 (0.09 – 6.85)	0.815
Region				
Hokkaido	0.99 (0.45 – 2.17)	0.976		
Tohoku	0.91 (0.41 – 2.02)	0.820		
Kanto	0.85 (0.60 – 1.20)	0.362		
Chubu	**1.44 (0.85 – 2.42)**	0.175	1.40 (0.80 – 2.44)	0.232
Kansai	1.05 (0.68 – 1.63)	0.816		
Chugoku	**0.52 (0.22 – 1.22)**	0.135	0.44 (0.18 – 1.08)	0.073
Shikoku	2.31 (0.60 – 8.88)	0.223		
Kyushu	1.13 (0.56 – 2.32)	0.729		
Annual individual income (reference: <3.7 M Yen)				
3.7–7.7 M Yen	1.09 (0.71 – 1.69)	0.840		
>7.7 M Yen	0.76 (0.41 – 1.40)	0.247		
Time since diagnose (reference: ≤5 years)				
6–10 years	1.12 (0.73 – 1.72)	0.599	0.99 (0.63 – 1.56)	0.978
>0 years	**1.73 (1.15 – 2.62)**	0.009	1.39 (0.88 – 2.19)	0.158
HAQ score	**1.21 (0.97 – 1.52)**	0.092	1.10 (0.84 – 1.43)	0.481
Comorbidity				
Hypertension	0.73 (0.46 – 1.15)	0.231		
High cholesterol	0.94 (0.51 – 1.71)	0.831		
Diabetes	1.45 (0.65 – 3.24)	0.369		
Migraines	0.77 (0.24 – 2.43)	0.415		
Depression	0.71 (0.32 – 1.60)	0.652		
Heart condition	1.37 (0.32 – 5.86)	0.674		

(Continued)

Table 2. (*Continued*)				
Characteristics	**Univariate analysis**		**Multivariate analysis**	
	ORs (95% CI)	***p*-value**	**ORs (95% CI)**	***p*-value**
Anxiety	0.84 (0.21 – 3.34)	0.806		
Current medication				
Pain killer (NSAIDs/oral pain med)	1.13 (0.71 – 1.82)	0.601		
Steroid	**1.49 (0.97 – 2.29)**	0.065	1.40 (0.88 – 2.22)	0.151
Depression condition (reference: no depression)				
Mild depression	**0.63 (042 – 0.94)**	0.025	0.62 (0.40 – 0.97)	0.034
Moderate to severe depression	**0.60 (0.35 – 1.04)**	0.068	0.54 (0.30 – 0.99)	0.040
RA-related medication (reference: DMARDs)				
DMARDs + biologic agent	**1.88 (1.22 – 2.90)**	0.004	1.69 (1.05 – 2.71)	0.030
Biologic agent	**2.50 (1.40 – 4.48)**	0.002	2.00 (1.09 – 3.69)	0.024

Notes: ORs: odds ratio, CI: confidence interval, NSAIDs: nonsteroidal anti-inflammatory drugs, M: million, HAQ: health assessment questionnaire DMARDs: disease-modifying anti-rheumatic drugs, Bold values indicate significance of 20% or better in the univariate analysis and of 5% or better in the multivariate analysis.

4. Discussion

SDM in medicine has become increasingly common in the United States and Europe. In the past, Japanese patients have demonstrated a preference for a more passive role in the medical decision-making process, by which the physician makes treatment decisions. However, some studies have suggested a temporal shift towards a greater preference for collaboration among Japanese patients. (Morishige, Nakajima, Yoshizawa, Mahlich, & Sruamsiri, 2016). Our results support this notion. In our sample, 93% of the RA patients found SDM either very or quite important, which reflects an ongoing cultural change in patient-physician interaction in Japan.

When it comes to the factors that are associated with a stronger preference for SDM, we found trend towards patients with a greater disease burden (as indicated by the HAQ score) being more likely to have a strong preference for SDM. A recent study on Japanese patients with prostate cancer also concluded that patients who are in a more severe condition prefer SDM (Schaede et al., 2017).

Our results demonstrate that SDM plays an important role in the treatment of female patients, which echoes results from other countries outside Japan (Mandelblatt, Kreling, Figeuriedo, & Feng, 2006; O'Donnell & Hunskaar, 2007a). The results also suggest a greater preference for treatment involvement among patients treated with biologics, although the reasons for this are not clear. The increased preference for SDM in patients treated with biologics may be due in some part to the significant increase in patient cost associated with use of biologics compared to conventional disease-modifying anti-rheumatic drugs (DMARDs). Patients in Japan may pay up to 30% co-payment for treatment, making the decision to use a biologic a potential financial burden that may trigger a desire for increased participation in treatment decisions. Further study to establish the relationship of patient cost and preference for collaborative decision-making in patients may result in useful innovations in treatment involvement and compliance.

The study did not find a significant difference between preferences among married patients and unmarried patients, although there was a clear tendency in the univariable regression for married patients to prefer SDM. Previous studies have demonstrated a significant preference for SDM among married patients compared to those who are not married (Gattellari & Ward, 2005).

There was no significant difference in patient preference for SDM by age groups. This was in contrast to earlier studies of patients in Western countries, which demonstrated a significant difference between age groups, with a clear patient preference for active participation among younger patients (Baars et al., 2010; Flynn et al., 1982). There did not appear to be a difference in preference due to level of education or occupation, in contrast to previous studies that found patients with lower skills were likely to prefer to delegate medical decisions (Gattellari & Ward, 2005; O'Donnell & Hunskaar, 2007a, 2007b; Shields et al., 2004).

Limitations of this study include its cross-sectional design, which captured patient perceptions at the time of the study. These perceptions may be fluid over time. A further area of study suggested by this research would be determination of the change in patient preferences for SDM over time and the factors that influence these changes. This was also an online survey which might not be representative of the overall Japanese population. Usually volunteers that are more familiar with the Internet take part in online surveys. This subpopulation might be more prone to collecting health-related information online and might express a stronger desire for SDM than the overall population.

5. Conclusion

Our study reveals a preference in the majority of Japanese patients with rheumatoid arthritis for collaborative decision-making with their physician. SDM allows for a collaborative process between patients and their physicians, by which clinical evidence is considered in light of patient preferences and values. SDM provides a framework for exploration of patient goals and imperatives, so that treatment decisions take into account the factors that are most important to the individual.

Author details
Jörg Mahlich[1,2]
E-mail: joerg.mahlich@gmail.com
Rosarin Sruamsiri[1,3]
E-mail: r.sruamsiri@gmail.com
[1] Department of Health Economics, Janssen Pharmaceutical KK, 5-2, Nishi-kanda 3-chome Chiyoda-ku, Tokyo 101-0065, Japan.
[2] Düsseldorf Institute for Competition Economics (DICE), University of Düsseldorf, Düsseldorf, Germany.
[3] Center of Pharmaceutical Outcomes Research, Naresuan University, Phitsanulok, Thailand.

References
Alden, D. L. M. M., & Akashi, J. (2012). Young adult preferences for physician decision-making style in Japan and the United States. *Asia Pacific Journal of Public Health, 24*, 173–184. https://doi.org/10.1177/1010539510365098
Aoki, A., Suda, A., Nagaoka, S., Takeno, M., Ishigatsubo, Y., Ashizawa, T., … Ohbu, S. (2013). Preferences of Japanese rheumatoid arthritis patients in treatment decision-making. *Modern Rheumatology, 23*, 891–896. https://doi.org/10.3109/s10165-012-0761-3
Baars, J. E., Markus, T., Kuipers, E. J., & van der Woude, C. J. (2010). Patients' preferences regarding shared decision-making in the treatment of inflammatory bowel disease: Results from a patient-empowerment study. *Digestion, 81*, 113–119. https://doi.org/10.1159/000253862
Bolge, S., Goren, A., Brown, D., Ginsberg, S., & Allen, I. (2016). Openness to and preference for attributes of biologic therapy prior to initiation among patients with rheumatoid arthritis: Patient and rheumatologist perspectives and implications for decision making. *Patient Prefer Adherence, 10*, 1079–1090.
Chan, C. M., & Ahmad, W. A. (2012). Differences in physician attitudes towards patient-centredness: Across four medical specialties. *International Journal of Clinical Practice, 66*, 16–20. https://doi.org/10.1111/ijcp.2011.66.issue-1
Coulter, A., Parsons, S., & Askham, J. (2008). *Where are the patients in decision-making about their own care?* Retrieved November 6, 2016, from: https://www.who.int/management/general/decisionmaking/WhereArePatientsinDecisionMaking.pdf

Counlter, A. (2007). When should you involve patients in treatment decisions? *British Journal of General Practice, 57*, 771–772.

Degner, L. F. S. J., & Venkatesh, P. (1997). The control preferences scale. *Canadian Journal of Nursing Research Archive, 29*, 21–43.

Flynn, K. E., Smith, M. A., & Vanness, D. (1982). A typology of preferences for participation in healthcare decision making. *Social Science & Medicine, 63*, 1158–1169.

Friedrichs, A., Spies, M., Harter, M., & Buchholz, A. (2006). Patient preferences and shared decision making in the treatment of substance use disorders: A systematic review of the literature. *PLoSOne, 11*(1), e0145817.

Furuya, H., Kasama, T., Isozaki, T., Umemura, M., Otsuka, K., Isojima, S., ... Takahashi, R. (2013). Effect of TNF antagonists on the productivity of daily work of patients with rheumatoid arthritis. *Journal of Multidisciplinary Healthcare, 6*, 25–30.

Gattellari, M., & Ward, J. E. (2005). Measuring men's preferences for involvement in medical care: Getting the question right. *Journal of Evaluation in Clinical Practice, 11*, 237–246. https://doi.org/10.1111/jep.2005.11.issue-3

Giordano, A., Mattarozzi, K., Pucci, E., Leone, M., Casini, F., Collimedaglia, L., & Solari, A. (2008). Participation in medical decision-making: Attitudes of Italians with multiple sclerosis. *Journal of the Neurological Sciences, 275*, 86–91. https://doi.org/10.1016/j.jns.2008.07.026

Kalkan, A., Roback, K., Hallert, E., & Carlsson, P. (2014). Factors influencing rheumatologists' prescription of biological treatment in rheumatoid arthritis: An interview study. *Implementation Science, 9*, 675. https://doi.org/10.1186/s13012-014-0153-5

Lindhiem, O., Bennett, C., Trentacosta, C., & McLear, C. (2014). Client preferences affect treatment satisfaction, completion, and clinical outcome: A meta-analysis. *Clinical Psychology Review, 34*, 506–517. https://doi.org/10.1016/j.cpr.2014.06.002

Mahlich, J., & Sruamsiri, R. (2016a). Treatment patterns of rheumatoid arthritis in Japanese hospitals and predictors of the initiation of biologic agent. *Current Medical Research and Opinion, 33*, 1–7.

Mahlich, J., & Sruamsiri, R. (2016b). Persistence with biologic agents for the treatment of rheumatoid arthritis in Japan. *Patient Preference and Adherence, 10*, 1509–1519. https://doi.org/10.2147/PPA

Mahlich, J., Matsuoka, S., & Sruamsiri, R. (2017). Shared decision making and treatment satisfaction in Japanese Patients with Inflammatory Bowel Disease (IBD). *Digestive Disease*. [Epub ahead of print]. doi:10.1159/000471795.

Mandelblatt, J., Kreling, B., Figeuriedo, M., & Feng, S. (2006). What is the impact of shared decision making on treatment and outcomes for older women with breast cancer? *Journal of Clinical Oncology, 24*, 4908–4913. https://doi.org/10.1200/JCO.2006.07.1159

Matsuda, Y., Singh, G., Yamanaka, H., Tanaka, E., Urano, W., Taniguchi, A., ... Kamatani, N. (2003). Validation of a Japanese version of the Stanford Health assessment questionnaire in 3,763 patients with rheumatoid arthritis. *Arthritis & Rheumatism, 49*, 784–788. https://doi.org/10.1002/(ISSN)1529-0131

Morishige, R., Nakajima, H., Yoshizawa, K., Mahlich, J., & Sruamsiri, R. (2016). Preferences regarding shared decision-making in Japanese inflammatory bowel disease patients. *Advances in Therapy, 33*, 2242–2256. https://doi.org/10.1007/s12325-016-0436-0

Narumi, J., Miyazawa, S., Miyata, H., Suzuki, A., Sugiura, T., Oshiumi, M., & Kosaka, S. (1998). Patients' understanding and opinion about informed consent for coronary angiography in a rural Japanese hospital. *Internal Medicine, 37*, 18–20. https://doi.org/10.2169/internalmedicine.37.18

O'Donnell, M., & Hunskaar, S. (2007a). Preferences for involvement in treatment decision-making among Norwegian women with urinary incontinence. *Acta Obstetricia et Gynecologica Scandinavica, 86*, 1370–1376. https://doi.org/10.1080/00016340701622310

O'Donnell, M., & Hunskaar, S. (2007b). Preferences for involvement in treatment decision-making generally and in hormone replacement and urinary incontinence treatment decision-making specifically. *Patient Education and Counseling, 68*, 243–251. https://doi.org/10.1016/j.pec.2007.06.009

Sakimoto, M., Asai, A., Ohnishi, M., Nishigaki, E., Tm, F., & Shimbo, T. I. Y. (2004). Patients' preferences for involvement in treatment decision making in Japan. *BMC Family Practice, 5*, 664–6641. https://doi.org/10.1186/1471-2296-5-1

Schaede, U., Mahlich, J., Nakayama, M., Kobayashi, H., Takahashi, Y., Saito, K., ... Yoshizawa, K. (2017). Shared decision-making in prostate cancer treatment in Japan: Patient preferences vs. physician perceptions. *Journal of Global Oncology, 1*, 1–1.

Shields, C. G., Morrow, G. R. G. J., Mallinger, J., Roscoe, J., Wade, J. L., Dakhil, S. R., ... Fitch, T. R. (2004). Decision-making role preferences of patients receiving adjuvant cancer treatment: A University of Rochester cancer center community clinical oncology program. *Supportive Cancer Therapy, 1*, 119–126. https://doi.org/10.3816/SCT.2004.n.005

Singh, J., Saag, K., Bridges, S., Akl, E., Bannuru, R., Sullivan, M., ... Curtis, J. R. (2016). American college of rheumatology guideline for the treatment of rheumatoid arthritis. *Arthritis Rheumatology, 68*(1), 1–26.

Smith, S., Pandit, A., Rush, S., Wolf, M., & Simon, C. (2016). The role of patient activation in preferences for shared decision making: Results from a national survey of U.S. adults. *Journal of Health Communication, 21*, 67–75. https://doi.org/10.1080/10810730.2015.1033115

Smolen, J. S., Landewe, R., Breedveld, F. C., Dougados, M., Emery, P., Gaujoux-Viala, C., ... Aletaha, D. (2010). EULAR recommendations for the management of rheumatoid arthritis with synthetic and biological disease-modifying antirheumatic drugs. *Annals of the Rheumatic Diseases, 69*, 964–975. https://doi.org/10.1136/ard.2009.126532

Smolen, J., Landewé, R., Breedveld, F. C., Buch, M., Burmester, G, Dougados, M., ... Ramiro, S. (2014). EULAR recommendations for the management of rheumatoid arthritis with synthetic and biological disease-modifying antirheumatic drugs: 2013 update. *Annals of the Rheumatic Diseases, 73*, 492–509. https://doi.org/10.1136/annrheumdis-2013-204573

Suzuki, K., Kumei, S., Ohhira, M., Nozu, T., & Okumura, T. (2015). Screening for major depressive disorder with the patient Health questionnaire (PHQ-9 and PHQ-2) in an outpatient clinic staffed by primary care physicians in Japan: A case control study. *PLOS One, 10*(3), e0119147. https://doi.org/10.1371/journal.pone.0119147

Tariman, J., Berry, D., Cochrane, B., Doorenbos, A., & Schepp, K. (2010). Preferred and actual participation roles during health care decision making in persons with cancer: A systematic review. *Annals of Oncology, 21*, 1145–1151. https://doi.org/10.1093/annonc/mdp534

cogent · medicine