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# Association between discontinuity of care and patient trust in the usual rheumatologist among patients with systemic lupus erythematosus: a cross-sectional study

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## Abstract

**Background** Patient trust plays a central role in the patient-physician relationship. This study aimed to determine whether the number of outpatient visits with a covering rheumatologist is associated with patient trust in their usual rheumatologist.

**Methods** Japanese adults with systemic lupus erythematosus (SLE) who met the 1997 revised classification criteria of the American College of Rheumatology and had outpatient visits with a covering rheumatologist in the past year were included.

We used the 11-item Japanese version of the modified Trust in Physician Scale (range 0–100) to assess patient trust. A general linear model with cluster-robust variance estimation was used to evaluate the association between the number of outpatient visits with covering rheumatologists and the patient's trust in their usual rheumatologist.

**Results** Of the 515 enrolled participants, 421 patients with SLE were included in our analyses. Patients were divided into groups according to the number of outpatient visits with a covering rheumatologist in the past year as follows: no visits (59.9%; reference group), one to three visits (24.2%; low-frequency group), and four or more visits (15.9%; high-frequency group). The median Trust in Physician Scale score was 81.8 (interquartile range: 72.7–93.2). Both the low-frequency group (mean difference: -3.03; 95% confidence interval [CI] -5.93 to -0.80) and high-frequency group (mean difference: -4.17; 95% CI -7.77 to -0.58) exhibited lower trust in their usual rheumatologist.

**Conclusion** This study revealed that the number of outpatient visits with a covering rheumatologist was associated with lower trust in a patient's usual rheumatologist.

**Keywords** Systemic lupus erythematosus, Patient-physician relationship, Outpatient visits, Patient trust, Discontinuity of care

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## Background

Discontinuity of care is a critical process with the potential to adversely affect the quality of patient care. For example, discontinuity of care has been associated with more avoidable hospitalizations and a higher number of procedures [1, 2]. Although significant attention has been directed toward inpatient handovers [3] and transitions related to year-end resident changeovers [4, 5], the effect of temporary outpatient physician coverage remains an understudied clinical question. The necessity of outpatient care coverage in the absence of the usual physician is a common and unavoidable occurrence [6] due to factors such as continuing medical education, maternity leave, or unexpected absenteeism caused by illness [7]. Acting as a surrogate during the usual physician's absence [8], the covering physician assumes identical responsibilities to those of the usual physician [9].

Systemic lupus erythematosus (SLE), which is characterized by multiple organ damage, requires life-long outpatient visits to mitigate functional disability and optimize quality of life. Maintaining a good physician–patient therapeutic relationship is important because outpatient rheumatologists are required to evaluate patients with SLE through laboratory testing and adjust complex medications based on changes in their disease activity. Trust in the usual rheumatologist is central to this therapeutic relationship [10]. Among patients with SLE, trust is associated with excellent medication adherence [11].

When a patient's visit requires coverage from another rheumatologist, the rheumatologist is expected to maintain the same quality of care. However, the progression of SLE may not be static, and the covering rheumatologist may be forced to make decisions about prescriptions and testing without an established relationship with the patient [12]. When a patient with SLE experiences an unsatisfactory visit with a covering rheumatologist, it may erode their trust in their usual rheumatologist. Although the association between trust and discontinuity of care has been examined primarily in European and US usual care settings, the results from quantitative studies have been inconsistent [13, 14], and few studies have focused on the discontinuity associated with outpatient physician coverage within the same department.

This study aimed to examine the association between the number of outpatient rheumatologist coverage by colleagues within the same department and patient trust in the usual rheumatologist among Japanese patients with SLE using data from a multicenter cross-sectional study of the Trust Measurement for Physicians and Patients with SLE (TRUMP<sup>2</sup>-SLE) project.

## Methods

### Study design and participants

This was a cross-sectional study using baseline data from the TRUMP<sup>2</sup>-SLE study, a multicenter cohort study currently conducted at five academic medical centers (Showa University Hospital, Okayama University Hospital, Shinshu University Hospital, Yokohama City University Hospital, and Yokohama City University Medical Centre). Patients aged  $\geq 20$  years who met the revised criteria in 1997 for SLE classification by the American College of Rheumatology (ACR) were included [15]. Patients seen by their usual rheumatologist for the first time were excluded from the study. All patients provided informed consent before enrolment. The patients were consecutively recruited between February 2020 and October 2021.

### Exposure

In this study, exposure was defined as the patient-reported number of outpatient visits with a covering rheumatologist (NVC) over the past years. A covering rheumatologist was defined as a rheumatologist in the same facility other than the usual rheumatologist. Based on frequency, the NVCs were classified into three categories: (1) no NVCs, (2) one to three NVCs (low-frequency group), and (3) four or more NVCs (high-frequency group).

### Outcome

The outcome of this study was trust in a patient's usual rheumatologist, using the Japanese version of the 11-item modified Trust in Physicians Scale by Thom [10, 16]. Each item was rated on a 5-point Likert scale ranging from 1 (totally disagree) to 5 (totally agree). The 4 negatively worded items were reverse coded, and the total score of all items was converted to a range of 0–100. This scale has demonstrated high internal consistency reliability (Cronbach's alpha coefficient = 0.91) and criterion-related validity [10].

### Covariates

Based on the literature and the clinical expertise of rheumatologists, the potential confounders were determined to be as follows: patient age [17], patient sex [17], physician age [18], physician sex [18], job title [19], duration of time since SLE diagnosis [19], disease activity, organ damage, emotional health, duration of the relationship with their usual rheumatologist (categorized as  $< 1$  year, 1–3 years, and  $\geq 3$  years), and the number of visits to their usual rheumatologist in the past years (categorized as 1–3 times, 4–6 times, and  $\geq 7$ ) [10, 18]. Given that there are only full professor and associate professor job titles in Japan that contain the Kanji character 'kyouju',

which means professor in English, and considering that health information from an authority figure is more likely to be trusted, the job titles were divided into two groups: associate professor or higher and lecturer or lower [19]. Disease activity was determined by the usual physician by using the SLE Disease Activity Index 2000 (SLEDAI-2 K). Organ damage was determined by the SLE International Cooperative Clinic/ACR Disability Index (SDI). Emotional health was determined by the LupusPRO domain and converted to a score of 0–100 points [20]. Higher emotional health scores indicated better emotional functioning and emotional roles.

**Statistical analysis**

Patient characteristics were summarized separately by NVCs, with continuous variables such as median and interquartile range (IQR), and categorical variables such as frequencies and percentages. A general linear model was fitted to examine the association between NVCs and the trust in the usual rheumatologist. All above-mentioned covariates were entered into the model. In addition, to investigate the possibility that the duration of the relationship with their usual physician may modify the association between NVCs and trust in the physician, their product terms were entered into the model. The presence of the interaction was assessed using the Wald

test. Next, a logistic regression model was fitted with all the above-mentioned covariates as explanatory variables to explore factors associated with high-frequency NVCs. In both models, cluster-robust variance estimation was used with each usual rheumatologist as a cluster unit to address the possibility of outcome similarity (that is, clustering) for the same usual rheumatologist [21]. Multiple imputations with chained equations were used to address missing data, assuming the data were randomly missing [22]. All missing values were multiply-imputed 100 times in the imputation process. These estimates were combined using Rubin's rule [22]. All analyses were performed using the Stata software (version 17.0; Stata Corp, College Station, TX, USA). Statistical significance was set at  $p < 0.05$ .

**Results**

**Patient and physician characteristics**

Of the 515 patients initially enrolled, 94 were excluded owing to missing or inadequate data on outcomes and exposures, and 421 were ultimately included in the usual analysis. The participant and physician characteristics are presented in Table 1. The median age of the patients was 47 years (IQR: 36–57), and 367 (87.2%) were female. The median duration of the disease was 12.6 years (IQR: 6.9–20.3), the median SLEDAI-2 K score was 4 (IQR: 1–6),

**Table 1** Patient and physician characteristics

Patient characteristics, N = 421	Total	NVC			Missing, n
		0 n = 252	1 to 3 n = 102	4 or more n = 67	
Patient age, median (IQR)	47.0 (36.0–57.0)	47.0 (36.0–59.0)	42.0 (34.8–50.0)	51.0 (41.0–63.0)	
Patient sex, female n (%)	367 (87.2%)	218 (86.5%)	95 (93.1%)	54 (80.6%)	
SLEDAI-2 K score, median (IQR)	4.0 (1.0–6.0)	4.0 (2.0–6.0)	4.0 (2.0–6.0)	2.0 (0.0–6.0)	
SDI score, median (IQR)	0.0 (0.0–1.0)	0.0 (0.0–1.0)	0.0 (0.0–1.0)	1.0 (0.0–2.0)	
Disease duration, year, median (IQR)	12.6 (6.9–20.3)	12.6 (7.3–18.6)	9.3 (6.3–18.6)	17.5 (9.7–29.2)	5
Emotional health domain score, median (IQR)	79.2 (54.2–91.7)	79.2 (62.5–91.7)	79.2 (54.2–87.5)	66.7 (33.3–91.7)	63
Duration of rheumatologist–patient relationship, n (%)					12
< 1 year	69 (16.4%)	36 (14.3%)	21 (20.6%)	12 (17.9%)	
1 to 3 years	76 (18.1%)	46 (18.3%)	15 (14.7%)	15 (22.4%)	
3 years or more	264 (62.7%)	163 (64.7%)	62 (60.8%)	39 (58.2%)	
Number of visits to usual rheumatologist, n (%)					9
1 to 3 times	52 (12.4%)	33 (13.1%)	15 (14.7%)	4 (6.0%)	
4 to 6 times	210 (49.9%)	132 (52.4%)	44 (43.1%)	34 (50.7%)	
7 times or more	150 (35.6%)	82 (32.5%)	41 (40.2%)	27 (40.3%)	
Rheumatologist characteristics, N = 39	Total				
Rheumatologist age, median (IQR)	43.0 (38.0–48.0)				
Rheumatologist sex, female, n (%)	9 (23.1%)				
Job title, n (%)					
Lecturer or lower	32 (82.1%)				
Associated professor or higher	7 (17.9%)				

and the median SDI was 0 (IQR: 0–1). Regarding NVCs, 252 (59.9%) had no visits, 102 (24.2%) had low-frequency visits (1–3), and 67 (15.9%) had high-frequency visits ( $\geq 4$ ). Patients were seen by 39 usual rheumatologists. The median age of the rheumatologists was 43 years (IQR: 38–48), and 9 (23.1%) were female. Seven (17.9%) rheumatologists were associate professors or higher in their job titles.

**Association between NVCs and trust in one’s usual physician**

The median Trust in Physician Scale score was 81.8 (IQR: 72.7–93.2), and the mean was 81.6 (standard deviation 13.3). The distribution of Trust in Physician Scale score is shown in Fig. 1. The association between NVCs and trust in the patient’s usual physician is presented in Table 2. In the adjusted model, compared with no NVCs, both low-frequency NVC (adjusted mean difference: -3.01; 95% confidence interval [CI] -5.93 to -0.80) and high-frequency NVC were associated with lower Trust in Physician Scale scores (adjusted mean difference: -4.17; 95% CI -7.77 to -0.58). We failed to demonstrate evidence of a global interaction between the association between NVCs and trust by the duration of

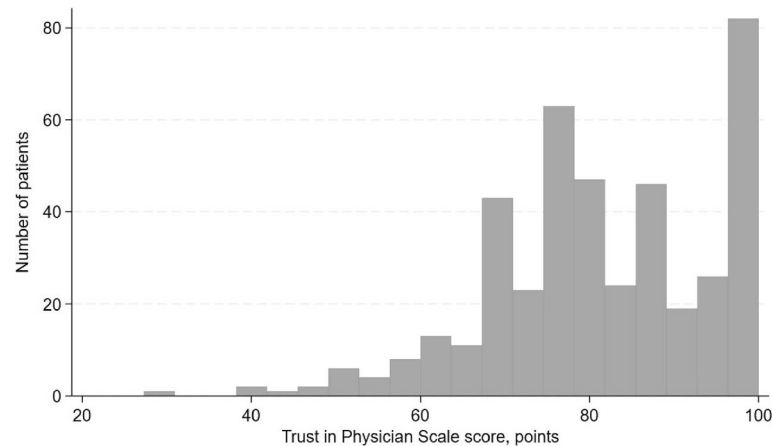
the relationship with the usual rheumatologist and NVCs ( $p$  for interaction = 0.138).

**Factors associated with highly frequent NVCs**

The exploratory associations between high-frequency NVCs and covariates are presented in Table 3. Greater organ damage (per 1-point higher SDI: adjusted odds ratio [aOR] 1.27, 95% CI 1.06–1.52) and more frequent visits to the usual physician (1–3 times vs. 4–6 times: aOR 3.94, 95% CI 1.48–10.48; 1 to 3 times vs.  $\geq 7$ : aOR 3.86, 95% CI 1.46–10.16) was positively associated with a high frequency of NVCs. In contrast, better emotional health (per point higher: aOR 0.98, 95% CI 0.97–0.99) and higher disease activity (per 1-point higher SLEDAI-2 K: aOR 0.90, 95% CI 0.84–0.97) were inversely associated with a high frequency of NVCs.

**Discussion**

This study showed that more frequent NVCs with a covering rheumatologist were associated with lower levels of trust in the usual rheumatologist among patients with SLE. The study found that a higher frequency of NVCs was associated with greater organ damage, lower



**Fig. 1** Distribution of Trust in Physician Scale Score. The median Trust in Physician Scale score was 81.8 (IQR 72.7–93.2), and the mean was 81.6 (standard deviation 13.3)

**Table 2** The association between NVCs and trust in one’s usual rheumatologist<sup>a,b</sup>

The number of visits to covering rheumatologist	Crude		Adjusted	
	β coefficient [95% CI]	P-value	β coefficient [95% CI]	P-value
No visits	Reference		Reference	
1 to 3 visits	-2.53 [-5.51 – 0.45]	0.094	-3.01 [-5.93 – -0.80]	0.044
4 visits or more	-5.84 [-9.54 – -2.14]	0.003	-4.17 [-7.77 – -0.58]	0.024

<sup>a</sup> General linear models with cluster-robust variance with usual rheumatologists as the units were fitted to address the clustering of outcomes by the rheumatologists  
<sup>b</sup> Adjusted models included patient age, sex, rheumatologist age, sex, job title, disease duration, SLEDAI-2 K, SDI, emotional health, duration of rheumatologist–patient relationship, and the number of visits to their usual rheumatologist

**Table 3** Patient and usual rheumatologist factors associated with a high number ( $\geq 4$  times/year) of outpatient visits<sup>a,b</sup>

	Odds ratio (95% CI)	P-value
Patient age, per 1-yr higher	1.01 (0.99–1.02)	0.551
Patient sex, female vs. male	0.55 (0.24–1.25)	0.153
Rheumatologist age, per 1-yr higher	1.03 (0.95–1.11)	0.512
Rheumatologist sex, female vs. male	0.77 (0.24–2.48)	0.660
<b>SLEDAI-2 K, per 1-pt higher</b>	<b>0.90 (0.84–0.97)</b>	<b>0.004</b>
<b>SDI, per 1-pt higher</b>	<b>1.27 (1.06–1.52)</b>	<b>0.008</b>
Disease duration, per 1-yr higher	1.03 (0.99–1.07)	0.081
Job title, associated professor or higher vs. lecturer or lower	1.34 (0.71–2.53)	0.366
<b>Emotional health, per 1-pt higher</b>	<b>0.98 (0.97–0.99)</b>	<b>0.004</b>
Duration of rheumatologist–patient relationship		
< 1 year	Reference	
1 to 3 years	0.63 (0.19–2.04)	0.436
3 years or more	0.41 (0.15–1.11)	0.081
Number of visits to usual rheumatologist		
1 to 3 times	Reference	
<b>4 to 6 times</b>	<b>3.94 (1.48–10.48)</b>	<b>0.006</b>
<b>7 times or more</b>	<b>3.86 (1.46–10.16)</b>	<b>0.006</b>

<sup>a</sup> Logistic regression model with cluster-robust variance with their usual rheumatologists as the unit was fit to address the clustering of outcomes by the rheumatologists

<sup>b</sup> All variables described in the table were entered into the model

emotional health, and a greater number of visits to the usual rheumatologist in the past year.

Few studies have investigated the effects of outpatient visits with a covering physician on the patient's relationship with their usual physician among patients with chronic disease. However, some studies have helped us to understand our study findings. First, rheumatologists can understand the possible mechanisms of the loss of trust with increased NVCs by revisiting the level of trust in their physicians. For example, if the usual rheumatologist's planned care (for example, performing laboratory tests and explaining their results or changing the dosage or class of medications) is not communicated to a covering rheumatologist, the patient may feel that the rheumatologist's words and actions are not credible [23]. On the other hand, a covering rheumatologist may be hesitant to change medications or order additional testing and may prefer to defer to the patient's usual rheumatologist; this could result in a delayed response to changes in the patient with SLE. In addition, if changes in care are not communicated clearly to their usual rheumatologist, the patient may feel that their usual rheumatologist is less informed and less capable of providing the best care. Patients with depression and/or anxiety who request visits more urgently that can be scheduled with their usual rheumatologist have lower emotional health.

The clinical implications of this study are noteworthy. First, rheumatologists need to be aware of the magnitude

and meaning of frequent NVCs on patients' trust in their usual rheumatologists. The magnitude of the 4.17-point lowering of trust scores associated with high frequency ( $\geq 4$  times/year) NVCs is equivalent to the magnitude (4.30 points) of the effect of past misdiagnosis experiences on trust lowering in current usual physicians [10]. Second, rheumatologists must establish preventive measures against loss of trust resulting from physician coverage. For example, in the case of computerized tools [24], medical facilities would be encouraged to implement a semi-automated system for handovers of planned laboratory testing, patient explanations, and prescriptions to a covering physician. Alternatively, they could also consider operating an electronic record or a card to be shared whenever any changes in patient care occur [6]. More fundamentally, a system that prevents physician coverage would be ideal. For example, if a rheumatologist takes a day off in advance, a patient scheduled to visit on that day should be notified beforehand to change their appointment date or accept an examination with a covering rheumatologist, thereby avoiding patient surprise or disappointment when they enter an examination room and meet an unfamiliar physician.

This study had several strengths worth mentioning. First, this was a multicenter study; therefore, the observed effects of rheumatologists' NVCs on patients' trust are generalizable to similar academic medical centers instead of reflecting the specific medical structure of

a particular institution's department. Second, we adjusted for the physician-level clustering of trust with appropriate multilevel analyses by merging data both from usual rheumatologists and from a large number of their patients [21]. Consequently, the observed association between rheumatologists' NVCs and trust did not reflect a particular rheumatologist's behavior [19]. Third, racial/ethnic homogeneity means that race/ethnicity is not a complicating factor [25].

However, this study had some limitations. First, the possibility of reverse causation cannot be excluded because of the cross-sectional study design. Some patients may have asked to see a covering rheumatologist because they had less trust in their usual rheumatologist. Second, we were unable to survey the reasons for the physician coverage. In addition to the usual rheumatologist's reasons for arranging coverage, patients may have visited another rheumatologist on a day other than the day of their appointments for patient-related reasons. For example, patients may have rescheduled their appointments when their rheumatologists were unavailable, or they may have visited another rheumatologist because of unexpected illness. Third, the generalizability of the findings of this study, which were conducted at academic medical centers affiliated with many rheumatologists, may be limited. For example, in the rheumatology departments of city hospitals or private clinics, where only one rheumatologist is often affiliated, rheumatologists must rely on non-rheumatology colleagues or locum tenens for their coverage [7, 26].

## Conclusions

Frequent outpatient NVCs by a covering rheumatologist were associated with lower trust in the usual rheumatologist among patients with SLE. Given that occasional time offs are sometimes required to sustain a medical practice without experiencing burnout, this study emphasizes the importance of preparing for possible adverse effects of unavoidable outpatient coverage.

### Abbreviations

ACR	American College of Rheumatology
aOR	Adjusted odds ratio
CI	Confidence interval
IQR	Interquartile range
NVC	Number of outpatient visits with a covering rheumatologist
SLE	Systemic lupus erythematosus
SLEDAI-2 K	SLE Disease Activity Index 2000
SDI	SLE International Cooperative Clinic/ACR Disability Index

### Acknowledgements

We would like to thank all collaborators in the TRUMP2-SLE project.

### Authors' contributions

Y.K. and N.K. had full access to all the data in the study and took responsibility for the integrity and accuracy of the data analysis. Concept and design: Y.K., Y.M., and N.K. Acquisition, analysis, or interpretation of data: Y.K., Y.M., S.N., Y.A., E.K., T.K., M.N., Y.M., N.O., N.Y., Y.I., N.S., C.H., R.Y., S.O., T.I., D.K., Y.S., K.S., J.W.,

D.T. and N.K. Drafting of the manuscript: Y.K., Y.M., and N.K. Critical revision of the manuscript for important intellectual content: Y.K., Y.M., K.S., S.N., Y.A., E.K., T.K., M.N., Y.M., N.O., N.Y., Y.I., N.S., C.H., R.Y., S.O., T.I., D.K., Y.S., K.S., J.W., D.T. and N.K. Statistical analysis: Y.K., Y.M., and N.K. Obtained funding: Y.M. and N.K. Administrative, technical, or material support: Y.K., Y.M., N.Y., R.Y., Y.S., K.S., and N.K. Supervision: Y.M., N.Y., R.Y., Y.S., K.S., D.T., and N.K.

### Funding

This study was supported by JSPS KAKENHI, grant numbers 19KT0021 (N. K.) and 22K19690 (N. K.).

### Data availability

The dataset analyzed in this paper is available from the corresponding author upon reasonable request.

## Declarations

### Ethics approval and consent to participate

This study was conducted in accordance with the Declaration of Helsinki, and the study protocol was approved by the Graduate School of Medical and Dental Sciences of Okayama University and the Okayama University Hospital Ethics Committee (approval number: 2204–020).

### Consent for publication

All patients provided informed consent before enrolment.

### Competing interests

Dr. Kurita reported receiving grants from the Japan Society for the Promotion of Science, consulting fees from GlaxoSmithKline K.K., and payments for speaking at and participating in educational events from Chugai Pharmaceutical Co., Ltd., Sanofi K.K., Mitsubishi Tanabe Pharma Corporation, and the Japan College of Rheumatology. Dr. Sada reported receiving a research grant from Pfizer, Inc. and a payment for speaking at and participating in educational events from GlaxoSmithKline K.K. Dr. Wada reported receiving speaker honoraria from Astra Zeneca, Bayer, Boehringer Ingelheim, Daiichi Sankyo, Kyowa Kirin, Novo Nordisk, and Mitsubishi Tanabe, and received grant support from Bayer, Chugai, Kyowa Kirin, Otsuka, Shionogi, Sumitomo, and Mitsubishi Tanabe. Dr. Matsumoto reported receiving grants from Asahi Kasei Pharma, Taisho, and AbbVie; received speaker honoraria from Astra Zeneca, Asahi Kasei Pharma, GlaxoSmithKline, and Pfizer, Inc.; and received a payment for participating in educational events from GlaxoSmithKline.

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Received: 20 August 2024 Accepted: 30 October 2024

Published online: 11 November 2024

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