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# Patient satisfaction after nurse-led care in Chinese patients with rheumatoid arthritis: A China study.

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## Abstract

**Objective: This study designed to evaluate the patient's satisfaction in patients managed by nurse and rheumatologist in Chinese rheumatoid arthritis patients attending rheumatology outpatient clinic.**
**Methods: In this single center randomized study, RA patients (≥ 18 year) who satisfied criteria of American College of Rheumatology visited at Department of orthopedic surgery, Weihai Central Hospital, Weihai, China between January 2010-December 2015 were analysed. Primary objective of study was to evaluate satisfaction of patients using Leeds Satisfaction Questionnaire (LSQ). Secondary objective of study was to evaluate DAS 28 score, VAS score for pain, fatigue and morning stiffness before and after each consultation over the period of 12 months.**
**Results: A total of 220 RA patients in two groups (n=110 in each group) were analysed. Demographic and baseline characteristic were comparable. Overall patient satisfaction was significantly higher in patients who were assigned in nurse care group as compared to rheumatologist throughout the study period (P<0.001). Improvement in disease activity (reduction in DAS20 score) over 12 months of follow period was significantly greater in nurse-led care group when compared to rheumatologist-led care (P<0.001). Also there was significantly greater improvement in pain, fatigue and duration of morning stiffness associated with RA over 12 months of follow period in nurse-led care group when compared to rheumatologist-led care (P<0.001).**
**Conclusion: Our preliminary finding suggested that the RA patients managed by NLC had significantly higher patient satisfaction, and had significantly greater improvement in disease symptoms than rheumatologist-led care.**

**Keywords:** Rheumatologist led care, Nurse led care, Patient's satisfaction, Rheumatoid arthritis.

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## Introduction

Rheumatoid Arthritis (RA) is associated with progressive joint destruction, which results in significant reduction of quality of life [1]. It also significantly impact patient's mental health and impair daily physical activities. Most of the RA patients taking immunosuppressant and/or other anti-RA drugs throughout their life which increases the financial burden on patients and their family [2].

Management of RA has improved substantially in recent years. The current focus on arresting disease activity results from an understanding that persistent joint inflammation leads to progressive joint destruction manifested by cartilage loss, erosive damage to juxta-articular bone, and resultant functional impairment [3]. Despite a variety of approved agents for RA, complete or sustained disease remission is unusual. Traditionally, the follow up of all RA patients in hospitals was performed by rheumatologists, but based on recent National Health Service (NHS) policy, the management of RA is moving from hospital to the community care, preferably by nurse led care. Currently, nurse led care or specialists nurse in rheumatology department are becoming important part of multidisciplinary RA management team and able to perform the entire routine task which was conducted by rheumatologists which includes administration of joint injections and prescribing [4-8].

Patient satisfaction is one of the key parameter to measure the quality of care [9-13]. In NLC model, patients are referred to NLC after diagnosis and treatment plan as introduced by the rheumatologist. The role of NLC in rheumatology clinic is to evaluate severity of disease, and to observe the effects of prescribed anti- RA medications, educate their patients and provide mental care, and sometimes even suggests the correct usage of medication or prescribes medications in clinical practice based on their knowledge and previous experience after consulting with rheumatologist. Several line of clinical evidences suggest that patients who were attended rheumatology clinics under NLC model had greater improvement in their RA symptoms and quality of life, and

had good clinical outcomes. In few developed countries, the concept of nurse care in rheumatology clinics is well established, whereas in other countries, it is in its beginning stage [14-18].

Nurse Led Care (NLC) model in rheumatology setting have already been established in Canada, USA, Australia and Europe (UK) in rheumatology services in management of chronic disorders, and was found effective. However, the concept of NLC was not well established in China, and there was no study evaluating the patient's satisfaction of nurse-led care versus rheumatologist-led care in Chinese patients with Rheumatoid Arthritis (RA). This is a first study in China designed to evaluate patient's satisfaction after nurse-led care versus rheumatologist-led care in Chinese patients with RA. The objective of this study was to check whether the concept of NLC is associated with higher patient satisfaction than rheumatologist-led care among Chinese patients with RA.

## Materials and Methods

Rheumatoid arthritis patients of either gender with age more than 18 year were enrolled. Data of RA patients visited at Department of orthopedic surgery, Weihai Central Hospital, Weihai, China between January 2010-December 2015 and scheduled to undergo routine follow-up. The patients who recently diagnosed (not more than 1 year) or had severe disability and having unstable diseases were not included.

At screening visit, individual participants who are willing to participate in this study were randomized to either experimental group (Nurse led care) or active control (rheumatologist led care) in allocation ration of 1:1. An independent assessor was appointed to record demography and disease activity. Rheumatologist and nurse had similar level of experience in managing outpatients of RA were selected. The independent assessor was health care professional and trained to counts joints, and calculates score based on Leeds Satisfaction Questionnaire and DAS 28. Independent assessor was also trained to record pain, fatigueness on VAS score. Duration of rigorousness during patients' first visit at clinic was also recorded. Also independent assessor counts joints, and calculated DAS 28 score for baseline. All the randomized patients were given LSQ before consultation to their assigned practitioner to measure satisfaction level. Rheumatologist or clinical nurse specialist were not participated in any kind of training as rheumatologist and clinical nurse specialist were expected to undertake their routine practice. At baseline, and post baseline visits (at months 3, 6, 9 and 12), each patient consulted to their corresponding practitioners. Clinical nurse specialist was usually given 30 min time to complete their assessment, clinical nurse specialist recorded medical and disease history, performed physical examination, evaluates severity of disease, and monitor the effects of prescribed anti-RA medications, educate their patients and provide mental care, and even instruct the correct usage of prescribed medication or prescribes medications. Clinical nurse specialist also involved in guiding correct laboratory investigations including X-ray examination as required. If required, patients were referred for admission or to the rheumatologist or any other health care professional. Rheumatologist was also provided the same time slot to evaluate the RA patients assigned to them. All interventions suggested by clinical nurse specialist and rheumatologist, and consultation duration of each of them were also recorded. The patients with additional visit were also recorded.

Primary objective of study was to evaluate satisfaction of patients using LSQ. This questionnaire was administered to each RA patients assigned to specialist nurse and rheumatologist to assess satisfaction. All the randomized patients were given questionnaires before consultation to their assigned practitioner, and were instructed to complete questionnaire before and after 3, 6 and 12 months of consultation. Each patient was instructed to specify their agreement by responding total of 45 questions in LSQ. Each question/statement has score based on agreement level based on five point scale range from 1 to 5 where 1 indicates (intensely agree) to 5 (intensely disagree). This questionnaire encompasses 6 sub-questionnaires which includes in-general satisfaction, providing information/Facts, responsiveness, capability, approach, admittance and stability of care and overall satisfaction scale.

Secondary objective of study was to evaluate DAS 28 score, VAS score for pain, fatigue and morning stiffness before and after each consultation over the period of 12 months. Also both the groups were compared in terms of effectiveness by measuring DSA 28 score and VAS score pertaining to pain, fatigue and morning stiffness.

In this study, we planned to include at least 100 patients in each group. Since this was a pilot randomized study designed to develop preliminary evidence of patient's satisfaction after visiting nurse led clinic and rheumatologist-led clinic. Therefore, there was no formal sample size calculation was performed. Quantitative variable was presented as mean ± standard deviation, and data were compared using parametric/ non-parametric statistical test based number of comparison group and distribution of data, using 2 sided statistical tests. A categorical variable was presented as absolute number and/or percentage of subjects in each category, and were compared using appropriate 2 sided statistical tests. Data from each patient was coded and analysed using Graph Pad Prism for statistical analysis (version 6.0).

## Results

In this study, total 220 RA patients who met eligibility criteria were enrolled in two groups (110 in each group). Of these enrolled patients, none of patients were drop out. Demographic and baseline characteristic between both the groups were comparable except the number of patients received biological anti-RA drugs (Table 1). At baseline, patients of both the group had comparable morning stiffness.

We observed that 96% of patients (106/110) in nurse group attended all visits, whereas 89% patients (98/110) in rheumatologist group. The mean consultation time was greater

in nurse group as compared to rheumatologist group (mean consultation time for all five visits including baseline: 134 min *vs.* 61 min, respectively). We also observed that the patients of nurse-led care group had extensive consultation (median consultation time: 38 min) as compared to the patients of rheumatologist-led care group (median consultation time: 12 min). On comparison to consultation outcome, we observed that lesser number of steroids injection, laboratory tests and radiological examinations were suggested in patients who were assigned to nurse care group when compared with rheumatologist care. Moreover, there was fewer changes made in dosage of their existing study medication, and significantly reduce the number of prescription for medications in nurse care group when compared to rheumatologist care group. We also observed that greater attention was given on patient education and mental support in nurse care group as compared to rheumatologist care group. Lesser unexpected hospitalization was observed in nurse care group when compared to rheumatologist care group.

We observed that overall patient satisfaction score at baseline (before consultation) comparable in nurse groups and rheumatologist care group. After consultations, we observed that the overall patient satisfaction was significantly greater in patients who were assigned in nurse care group as compared to rheumatologist throughout the study period ($p<0.001$). Similar trend was observed when comparison was made between both the groups for all sub-scales of patient's satisfaction questionnaire ($p<0.001$). In nurse groups, patients had increased satisfaction in all sub-scales from baseline, and the difference was statistically significant for all sub-scales. In rheumatologist care group, patients' satisfaction was greatly reduced mainly in two sub-scales: providing of information and admittance and stability of care. Overall patient's satisfaction was greater in patients who were assigned in nurse group as compared to rheumatologist care group. Significantly greater reduction in DAS20 score from baseline was observed in patients who were assigned in nurse care group than rheumatologist throughout the study period (Table 2). Reduction in VAS score for pain and fatigueness were significantly greater in patients of nurse care group than rheumatologist group during study period (Table 3). Similar trend was observed for duration of morning stiffness.

***Table 1.*** *Demography and baseline characteristic.*

| Parameters | Nurse-led care group (N=110) | Rheumatologist-led care group (N=110) | P value |
|---|---|---|---|
| Age, years | | | |
| mean (SD) | 44.5 (4.9) | 46 (4.8) | 0.023* |
| Female, n (%) | 90 (84%) | 94 (88%) | 0.58** |
| Duration of RA[a], years mean (SD) | 9.1 (3.2) | 8.4 (2.3) | 0.064* |
| Concomitant diseases, n (%) | | | |
| High BP | 29 | 19 | |
| OA of knee | 28 | 39 | 0.0406** |
| Bronchial asthma | 19 | 27 | |
| Thyroid disorder | 34 | 21 | |
| RA medications | | | |
| Mtx | 23 | 16 | 0.750** |
| bDMARD | 16 | 19 | |
| Chloroquine and its derivative | 21 | 20 | |
| Sulfasalzine | 15 | 18 | |
| Costicosteriods (prednisolone) | 17 | 19 | |
| Leflunomide | 18 | 18 | |
| Baseline score of outcome, mean (SD) | | | |
| DAS 28 | 4.41 (2.24) | 4.32 (1.51) | 0.73* |
| Pain (VAS score) | 41.12 (9.32) | 40.13 (8.13) | 0.40* |
| Fatigue (VAS score) | 42.13 (16.24) | 44.14 (21.14) | 0.43* |
| Stiffness (duration of stiffness) | 47.24 (18.32) | 48.72 (64.31) | 0.82* |

Values are reported as number and proportions, or mean values and SD. Abbreviation: DAS-28: Disease Activity Score 28 joint count; VAS: Visual Analogue Scale; bDMARD: Biological Disease-modifying anti-rheumatic drug. Difference between groups was analysed by Unpaired "t" test* for quantitative/numerical variable, and Chi-square test** for categorical variable.

***Table 2.*** *Comparison of patient satisfaction between Nurse-led care vs. rheumatologist-led care.*

| Parameters | Nurse-led care group (N=110) | Rheumatologist-led care group (N=110) | P value* |
|---|---|---|---|
| In-general contentment | | | |
| Baseline | 3.65 (0.36) | 3.75 (0.16) | <0.001 |
| 6 month | 3.98 (0.75) | 3.28 (0.45) | <0.001 |
| 9 month | 4.63 (0.61) | 4.02 (0.31) | <0.001 |
| 12 month | 4.82 (0.92) | 4.12 (0.22) | <0.001 |
| Providing information/Facts | | | |
| Baseline | 3.55 (0.36) | 3.65 (0.16) | <0.001 |
| 6 month | 3.99 (0.72) | 3.18 (0.15) | <0.001 |
| 9 month | 4.59 (0.21) | 4.01 (0.12) | <0.001 |
| 12 month | 4.82 (0.92) | 4.12 (0.22) | <0.001 |
| Responsiveness | | | |
| Baseline | 3.75 (0.36) | 3.55 (0.36) | <0.001 |
| 6 month | 3.98 (0.75) | 3.99 (0.72) | <0.001 |
| 9 month | 4.75 (0.61) | 4.94 (0.92) | <0.001 |
| 12 month | 4.89 (0.92) | 3.98 (0.75) | <0.001 |
| Capability | | | |
| Baseline | 3.45 (0.36) | 3.63 (0.21) | <0.001 |
| 6 month | 3.92 (0.75) | 4.82 (0.82) | <0.001 |
| 9 month | 4.91 (0.61) | 3.92 (0.55) | <0.001 |
| 12 month | 4.94 (0.92) | 3.73 (0.31) | <0.001 |
| Approach | | | |
| Baseline | 3.54 (0.36) | 3.88 (0.35) | <0.001 |
| 6 month | 3.98 (0.35) | 4.58 (0.35) | <0.001 |
| 9 month | 4.75 (0.31) | 4.89 (0.72) | <0.001 |
| 12 month | 4.89 (0.52) | 4.59 (0.21) | <0.001 |
| Admittance and stability of care | | | |
| Baseline | 3.55 (0.36) | 3.99 (0.72) | <0.001 |
| 6 month | 3.99 (0.72) | 4.59 (0.21) | <0.001 |
| 9 month | 4.75 (0.61) | 4.63 (0.61) | <0.001 |
| 12 month | 3.98 (0.35) | 4.82 (0.92) | <0.001 |
| Overall contentment | | | |
| Baseline | 3.63 (0.61) | 3.55 (0.36) | <0.001 |
| 6 month | 4.82 (0.92) | 3.67 (0.75) | <0.001 |

| | | | |
|---|---|---|---|
| 9 month | 3.98 (0.75) | 3.98 (0.35) | <0.001 |
| 12 month | 4.75 (0.61) | 4.75 (0.31) | <0.001 |

Values are reported as mean values and SD. Abbreviation: DAS-28: Disease Activity Score 28 joint count; VAS: Visual Analogue Scale. *Difference between groups was analysed by independent samples t test.

***Table 3.*** *Change in DAS20 (primary outcome) and VAS score (secondary outcome) over the period of 12 months.*

| Parameters | Nurse-led care group (N=107) | Rheumatologist-led care group (N=107) | P value* |
|---|---|---|---|
| DAS28 Score | | | |
| 3 month | 3.21 (1.21) | 4.23 (1.01) | <0.001 |
| 6 month | 2.21 (0.87) | 2.11 (1.32) | <0.001 |
| 9 month | 1.13 (1.26) | 1.83 (1.22) | <0.001 |
| 12 month | 1.02 (1.32) | 0.98 (1.06) | <0.001 |
| Pain (VAS score) | | | |
| 3 month | 39.13 | 33.03 | <0.001 |
| 6 month | 35.08 | 32.12 | <0.001 |
| 9 month | 30.03 | 27.06 | <0.001 |
| 12 month | 29.21 | 26.03 | <0.001 |
| Fatigue (VAS score) | | | |
| 3 month | 49.13 | 43.03 | <0.001 |
| 6 month | 45.48 | 41.12 | <0.001 |
| 9 month | 40.23 | 43.06 | <0.001 |
| 12 month | 49.41 | 44.03 | <0.001 |
| Stiffness (duration of stiffness, in Minutes) | | | |
| 3 month | 59.23 | 53.23 | <0.001 |
| 6 month | 55.23 | 51.32 | <0.001 |
| 9 month | 50.21 | 53.46 | <0.001 |
| 12 month | 59.42 | 54.53 | <0.001 |

Values are reported as mean values and SD. Abbreviation: DAS-28: Disease Activity Score 28 joint count; VAS: Visual Analogue Scale. *Difference between groups was analysed by independent samples t test.

## Discussion

This was the first clinical study in China which evaluated patient satisfaction among Chinese RA patients managed by nurse and rheumatologist. In this study, patient satisfaction and clinical effectiveness related to RA treatment was compared between among Chinese RA patients who were managed by rheumatologist and clinical specialist nurse. We observed that the patients who were managed by clinical specialist nurse (patients of nurse-led care group) had greater satisfaction and more favorable clinical outcome in terms of diseases activity. Demography and baseline characteristic were comparable in both the groups. Statistical results favor the nurse-led care over rheumatologist-led care in RA patients for primary endpoints (patient satisfaction). The reason could be nurse-led consultation was longer and extensive which could make patient more satisfied than the patients of rheumatologist-led care group [9-12]. Overall, the patients of nurse-led consultation were more satisfied in terms cost associated with RA as lesser number of steroids injection, laboratory tests and radiological examinations were suggested in patients who were assigned to nurse care group when compared with rheumatologist care. Also there was fewer changes made in dosage of their existing study medication, and significantly reduce the number of prescription for medications in nurse care group when compared to rheumatologist care group. Statistical significance results in primary endpoint was observed might be because the patients of nurse-led care group had received greater attention on patient education and mental support as compared to rheumatologist care group. This could be one of

the reasons for less number of unexpected hospitalization or unplanned visit to the site in nurse care group as compared to rheumatologist care group. We noticed that the patient's complain about the pain, fatigue and duration of morning stiffness associated with RA over 12 months of follow period was gradually decreasing in nurse-led care group, and overall the improvement in pain, fatigue and duration of morning stiffness associated with RA was greater in patients of nurse-led group than rheumatologist care group.

In rheumatologist care group, we observed the patients were not satisfied in two subscale of Leeds Satisfaction Questionnaire (LSQ): "providing information" and "admittance and stability of care" over the period of 12 months. In nurse-led care group, all patients had increased satisfaction in all sub-scale of LSQ. Patient care and education is one of most important and key role of nurses working in rheumatology clinic. Nurses of rheumatology clinic promote patient education about the diseases and its management to their patients which allows their patients to make well-informed decisions and take care of their illness by adopting self-management strategies for management of RA. Several lines of clinical evidences confirmed that the nurse of rheumatology outpatient clinic offers effective patient education which leads to increase satisfaction level of their patient, which is also declared in recent EULAR recommendation as key role in management of RA patients. We observed that the patients had greater understanding of diseases, its treatment, and self-management strategies that were managed by nurses in rheumatology outpatients clinic. It has been observed that nurses are more likely to be available for patients, and continue to provide care which establishes a good relationship. In our study, mean consultation time was significantly longer in nurse-led care group (median consultation time: 38 min) as compared to rheumatologist-led care group (median consultation time: 12 min). Our finding related to patient satisfaction comparison between both the groups was in consistent with previous studies of American patients. Overall patient satisfaction was significantly greater in nurse care group when compared to rheumatologist ($p<0.001$).

Since this was designed as pilot study, the interpretation based on result of this study could not generalize. Based on finding our paper, we encourage for conducting a randomized, multicentric, pivotal longitudinal study to evaluate the patient satisfaction of NLC versus rheumatologist-led care in Chinese patients with RA in order to confirm our finding. Our study will serve the basis for conducting large multi-centric randomized clinical study to establish the concept of NLC in Chinese patients with RA.

## Conclusion

Our preliminary finding suggested that the RA patients managed by NLC had significantly higher patient satisfaction, and had significantly greater improvement in disease symptoms than rheumatologist-led care.

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## Statement of Competing Interests

Authors' declare no conflict of interest.

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