

# Addressing rural and remote access disparities for patients with inflammatory arthritis through video-conferencing and innovative inter-professional care models

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## Abstract

- Objective:** The aim of the present study was to evaluate whether rheumatoid arthritis (RA) patients followed longitudinally using video-conferencing and inter-professional care support have comparable disease control to those followed in traditional in-person rheumatology clinics.
- Methods:** This was a randomized controlled trial for 85 RA patients allocated to either traditional in-person rheumatology follow-up or video-conferenced follow-up with urban-based rheumatologists and rural in-person physical therapist examiners. Follow-up was every 3 months for 9 months. Outcome measures included disease activity metrics (disease activity in 28 joints with CRP measure score [DAS28-CRP], and RA disease activity index [RADAI]), modified health assessment questionnaire (mHAQ), quality of life (EuroQOL five dimensions questionnaire [EQ5D]) and patient satisfaction (nine-item visit-specific satisfaction questionnaire [VSQ9]).
- Results:** Of 85 participants, 54 were randomized to the video-conferencing team model and 31 to the traditional clinic (control group). Dropout rates were high, with only 31 (57%) from the video-conferencing and 23 (74%) from the control group completing the study. The mean age for study participants was 56 years; 20% were male. Mean RA disease duration was 13.9 years. There were no significant between-group differences in DAS28-CRP, RADAI, mHAQ or EQ5D scores at baseline or over the study period. Satisfaction rates were high in both groups.
- Conclusions:** We found no evidence of a difference in effectiveness between inter-professional video-conferencing and traditional rheumatology clinic for both the provision of effective follow-up care and patient satisfaction for established RA patients. High dropout rates reinforce the need for consultation with patients' needs and preferences in developing models of care. While use of video-conferencing/telehealth technologies may be a distinct advantage for some patients, there may be loss of travel-related auxiliary benefits for others.

## Introduction

- Rheumatoid arthritis (RA) affects 1% of Canadian which permits regular follow-up, with more frequency dependent on their disease activity and severity.<sup>1</sup>
- Unfortunately, all the rheumatologists serving almost two-thirds of the province of Saskatchewan are located in the city of Saskatoon.
- Over half of Northern Saskatchewan's population resides in small communities or rural areas some of which are isolated and inaccessible by road.
- Telehealth distance technologies have been considered as an option to mitigate healthcare challenges or obstacles for people living in rural or remote locations. The use of this technology in addressing rural and remote disparities to healthcare access has welcomed positive reviews and acceptance by patients and health care professionals alike.<sup>2,3,4,5</sup>
- The objective of the present study was to evaluate whether RA patients followed longitudinally over a 9-month period using video-conferencing and inter-professional care support with physical therapists would have comparable disease control with those followed in traditional in-person rheumatology clinics over a 9-month time frame.

## Methods

- The study was approved by the University of Saskatchewan Biomedical Research Ethics Board and registered with ClinicalTrials.gov PRS, (identification number NCT02371915).
- A total of 318 people with RA were invited to participate, of whom 85 agreed and completed the informed consent process.
- A randomized block design will be utilized to randomly allocate participating patients to two arms, either to be followed by telehealth/VC in or near their home community (Intervention group) or to continue travelling to Saskatoon rheumatology clinic (Control group).
- All patients were followed up 3-monthly for a total of 9 months with disease outcome measures such as their disease activity score in 28 joints with CRP [DAS28-CRP], RA disease activity index [RADAI], modified health assessment questionnaire (mHAQ) taken at each clinic visit (either through telehealth or traditional out-patient clinics).
- Patient quality of life assessments using EuroQOL five dimensions questionnaire [EQ5D] and patient satisfaction with type of visit using a nine-item visit-specific satisfaction questionnaire [VSQ9] were also evaluated at each clinic visit through-out the 9-month time frame.

## Results

Table 1: Patient Demographic Characteristics

| Variable       | Levels              | N  | Control (%) | Intervention (%) |
|----------------|---------------------|----|-------------|------------------|
| All            |                     | 85 | 31          | 54               |
| Gender         | Male                | 17 | 6 (19%)     | 11 (20%)         |
|                | Female              | 68 | 25 (81%)    | 43 (80%)         |
| Marital Status | Married             | 58 | 19 (68%)    | 39 (76%)         |
|                | Not Married         | 21 | 9 (32%)     | 12 (24%)         |
| Education      | High School or less | 30 | 10 (36%)    | 20 (39%)         |
|                | Trade School        | 17 | 6 (21%)     | 11 (22%)         |
|                | Some University     | 12 | 5 (18%)     | 7 (14%)          |
|                | University Degree   | 20 | 7 (25%)     | 13 (25%)         |
| Income         | <\$30,000           | 19 | 5 (19%)     | 14 (29%)         |
|                | \$30,000 - \$59,999 | 19 | 8 (31%)     | 11 (22%)         |
|                | \$60,000 - 99,999   | 21 | 6 (23%)     | 15 (31%)         |
|                | >\$100,000          | 16 | 7 (27%)     | 9 (18%)          |
| Work           | Paid Work           | 40 | 15 (54%)    | 25 (49%)         |
|                | Unemployed          | 17 | 5 (18%)     | 12 (24%)         |
|                | Retired             | 22 | 8 (29%)     | 14 (27%)         |
| Smoker         | Smoker              | 18 | 9 (33%)     | 9 (18%)          |
|                | Former Smoker       | 39 | 10 (37%)    | 29 (57%)         |
|                | Non-smoker          | 21 | 8 (30%)     | 13 (25%)         |

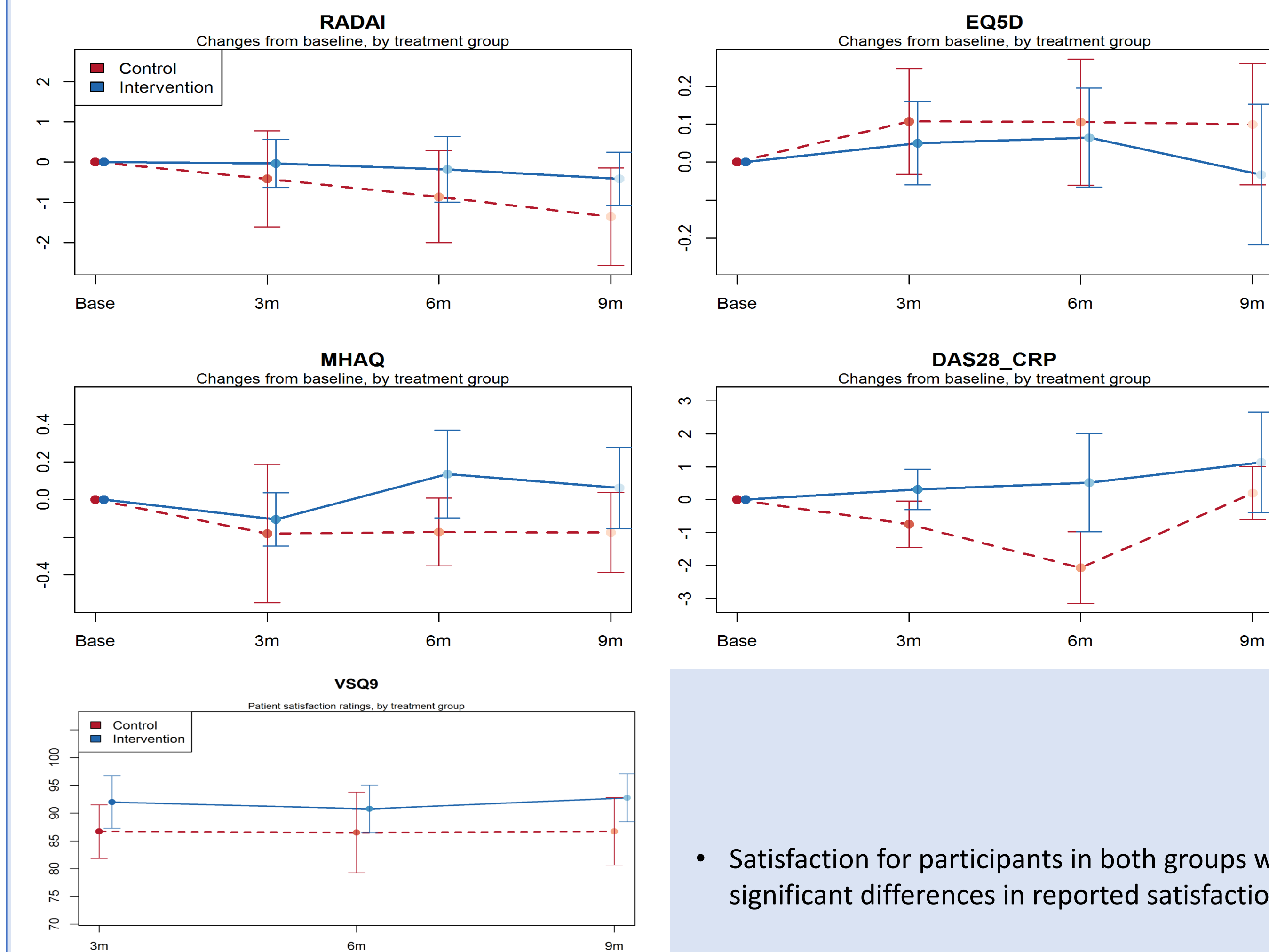
Table 2: Changes in disease activity and Quality of Life measures from baseline to 9 months

| Measure   | Control | Intervention | Difference | 95% CI      | P-Value |
|-----------|---------|--------------|------------|-------------|---------|
| RADAI     | -1.4    | -0.4         | 0.9        | [-2.4, 0.5] | 0.1926  |
| EQ-5D     | 0.1     | 0.0          | -0.1       | [-0.1, 0.4] | 0.2942  |
| mHAQ      | -0.2    | 0.1          | 0.2        | [-0.5, 0.1] | 0.1358  |
| DAS28-CRP | 0.2     | 1.1          | 0.9        | [-3.1, 1.2] | 0.3338  |

KEY: CI, confidence interval; DAS28-CRP, disease activity in 28 joints with CRP measure score; EQ5D, EuroQol five dimensions questionnaire; mHAQ, modified health assessment questionnaire; RADAI, rheumatoid arthritis disease activity index

## Results and Discussion

Figure 1: Disease activity (mHAQ, DAS28-CRP and RADAI) and quality of life (EQ5D) measures and Patient satisfaction (VSQ9 scores) over time for both study groups



KEY: DAS28-CRP, disease activity in 28 joints with CRP measure score; EQ5D, EuroQol five dimensions questionnaire; mHAQ, modified health assessment questionnaire; RADAI, rheumatoid arthritis disease activity index; VSQ9, nine-item visit-specific satisfaction questionnaire

- We incurred a huge drop-out rate during the study. A total of 31 participants dropped out over the course of the study. Several reasons provided for leaving the study related primarily to a preference to travel to the city for their rheumatology appointment, for various reasons, and, to a lesser extent, a disinclination to continue with the study and complete the study questionnaires.
- Using the DAS28-CRP as the primary outcome measure, we did not find any statistically significant difference between the two follow-up clinic models. Similarly, there were no significant differences in RADAI, mHAQ or EQ5D scores over the course of the study period. These results provide no evidence to suggest a difference between effectiveness of video-conferencing compared with traditional clinics in the provision of longitudinal follow-up care for patients with established RA.
- There were also no statistically significant differences in satisfaction scores between groups. It should be clearly noted that patient satisfaction scores were not lower for those who participated in the video-conferencing clinics. These findings are in keeping with the results reported in other RA patients in a similar population and rural setting

## Conclusions

- Based on the results from the current study, there was no evidence of a difference in effectiveness between video-conferencing follow-up and traditional in-clinic follow-up in terms of disease activity measures (DAS28-CRP, RADAI, mHAQ), quality of life (EQ5D) or patient satisfaction (VSQ9) over the study period of 9–10 months; however, given the relatively high dropout rate, these results should however be interpreted with caution.
- Video-conferencing in an inter-professional collaborative care model appears to be a feasible method for follow-up of stable long-term RA patients who live in rural/remote parts of the province.
- Strategies for the development of models of care need to involve consultation with the people they are being developed to serve. While distance technology may be a distinct improvement and advantage for some patients, there may be loss of auxiliary benefits for others which the travel facilitates/supports.

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