

REVIEW PAPER
ARTIGO DE REVISÃO**Effectiveness of nursing consultations in people with rheumatoid arthritis: systematic review**

Eficácia de consultas realizadas por enfermeiros em pessoas com artrite reumatóide: revisão sistemática

Eficacia de las consultas realizadas por enfermeros en pacientes con artritis reumatoide: revisión sistemática

Fabiana Isabel Moreira de Sousa*; Eduardo José Ferreira dos Santos**; Madalena Cunha***; Ricardo Jorge Oliveira Ferreira****; Andréa Ascensão Marques*****

Abstract**Background:** Traditionally, patients with rheumatoid arthritis are only monitored in medical consultations. However, several studies suggest that, with protocols, this follow-up can also be performed by nurses.**Objectives:** To determine the effectiveness of nursing consultations in controlling disease activity and other patient-reported outcomes compared to rheumatology consultations only, in patients with rheumatoid arthritis.**Review Method:** The Cochrane methodology was followed. Studies that had been conducted with adults with rheumatoid arthritis were included. Critical appraisal, data extraction, and data synthesis were performed by 2 independent reviewers.**Presentation and interpretation of results:** The 7 studies included reported better outcomes of nursing consultations in terms of pain, physical function, quality of life, self-efficacy, or overall satisfaction. Of these, 4 studies were included in the meta-analysis, which revealed no statistically significant differences in the control of disease activity between nursing and rheumatology consultations.**Conclusion:** Nursing consultations are effective in controlling disease activity, reducing disease impact, and improving satisfaction in people with rheumatoid arthritis.**Keywords:** arthritis, rheumatoid; nursing care; review literature as topic; outcome assessment (health care); meta-analysis**Resumo****Enquadramento:** Tradicionalmente, as pessoas com artrite reumatóide são monitorizadas apenas em consultas médicas. No entanto, vários estudos sugerem que este seguimento pode ser realizado também por enfermeiros, de forma protocolada.**Objetivos:** Determinar a eficácia das consultas de enfermagem no controlo da atividade da doença e de outros *outcomes* reportados em comparação com as consultas realizadas apenas por reumatologistas, em pessoas com artrite reumatóide.**Método de Revisão:** Seguiu-se a metodologia da Cochrane. Incluíram-se estudos em adultos com artrite reumatóide. Dois revisores independentes realizaram a avaliação crítica, extração e síntese dos dados.**Apresentação e interpretação dos resultados:** Os 7 estudos incluídos reportaram melhores resultados das consultas de enfermagem em termos de dor, capacidade funcional, qualidade de vida, autoeficácia, ou satisfação global. Destes estudos, 4 integraram a meta-análise que revelou não existir diferença estatisticamente significativa no controlo da atividade da doença entre enfermeiros e reumatologistas.**Conclusão:** As consultas de enfermagem são eficazes no controlo da atividade de doença, na redução do impacto sentido e na satisfação em pessoas com artrite reumatóide.**Palavras-chave:** artrite reumatóide; cuidados de enfermagem; literatura de revisão como assunto; avaliação de resultados (cuidados de saúde); metanálise**Resumen****Marco contextual:** Normalmente a las personas con artritis reumatoide solo se las monitoriza en consultas médicas. Sin embargo, varios estudios sugieren que este seguimiento lo pueden realizar también los enfermeros, de forma protocolaria.**Objetivos:** Determinar la eficacia de las consultas de enfermería para controlar la actividad de la enfermedad y de otros resultados en comparación con las consultas realizadas solo por reumatólogos en pacientes con artritis reumatoide.**Método de revisión:** Se siguió la metodología de Cochrane. Se incluyeron estudios en adultos con artritis reumatoide. Dos revisores independientes realizaron una evaluación crítica, extracción y síntesis de los datos.**Presentación e interpretación de los resultados:** Los 7 estudios incluidos registraron mejores resultados de las consultas de enfermería en relación al dolor, la capacidad funcional, la calidad de vida, la autoeficacia o la satisfacción global. De estos estudios, 4 formaron parte del metanálisis en el que se observó que no existía diferencia estadísticamente significativa en el control de la actividad de la enfermedad entre enfermeros y reumatólogos.**Conclusión:** Las consultas de enfermería son eficaces en el control de la actividad de la enfermedad, en la reducción del impacto sentido y en la satisfacción de los pacientes con artritis reumatoide.**Palabras clave:** artritis reumatoide; atención de enfermería; literatura de revisión como asunto; evaluación de resultado (atención de salud); metanálisis*MSc, Postgraduate student, IPIVSSN, RN, Coimbra Hospital and University Center, FPE – Neurosurgery Unit, Campus H.U.C., 3000475, Coimbra, Portugal (fabianaim@iportal.com). Contribution to the article: research design and identification of studies; methodological quality assessment of studies; data extraction; presentation and interpretation of results; conclusions; article writing; contribution to the study development.**MSc, Ph.D., Postgraduate student, ICBAS-UP, RN, Associate Researcher, Portugal Centre for Evidence-Based Practice: a Collaborating Centre of the Joanna Briggs Institute, Coimbra Hospital and University Center, FPE – Emergency Unit, Campus H.U.C., 3000475, Coimbra, Portugal (eduardo.j.ferreira@iportal.com). Contribution to the article: research design; methodological quality assessment of studies; data extraction and synthesis; presentation and interpretation of results; conclusions; article writing; contribution to the study development. Address for correspondence: Unidade de Investigação em Cuidados da Saúde-Enfermagem, 3016-851, Coimbra, Coimbra Portugal.***Ph.D., Adjunct Professor, School of Health and Researcher of the Center for the Study of Education, Technologies and Health (C3E/DETS), 3500-813, Viseu, Portugal (madal@iportal.com). Contribution to the article: research design; presentation and interpretation of results; conclusions; article writing.****MSc, Ph.D., Student, FMUC, RN, Coimbra Hospital and University Center, FPE – Rheumatology Unit, Campus H.U.C., 3000475, Coimbra, Portugal (ricardo.j.oliveira@iportal.com). Contribution to the article: research design and identification of studies; methodological quality assessment of studies; conclusions; article writing.*****Ph.D., Student, FMUC, RN, Coimbra Hospital and University Center, FPE – Rheumatology Unit, Campus H.U.C., 3000475, Coimbra, Portugal (andrea.marques@iportal.com). Contribution to the article: research design and identification of studies; methodological quality assessment of studies; conclusions; article writing.

Introduction

Rheumatoid arthritis (RA) is a chronic, progressive, autoimmune disease (Gabay, Nissen, & van Laar, 2015). In Portugal, it is estimated to affect 0.7% of the adult population (Branco et al., 2016). Its clinical presentation is very heterogeneous and systemic, and it is not limited to joint inflammation (Gabay et al., 2015). Symptoms such as pain, fatigue, morning stiffness, sleep disorders, or depression significantly affect patients' quality of life (Boonen & Severens, 2011; Ferreira et al., in press). For this reason, their follow-up is a constant challenge, requiring specialized, continuous, and systematic monitoring (Gabay et al., 2015). One of the key parameters in the evaluation of these patients is disease activity. The 28-joint Disease Activity Score (DAS28) is the most widely used tool for this purpose. It consists of an algorithm that takes into account the number of tender joints and swollen joints (out of 28 examined), the value of an inflammatory parameter (C-reactive protein or erythrocyte sedimentation rate) and may include a patient's overall assessment of disease activity (rated from 0 to 100mm). According to DAS28, a score < 2.6 indicates remission and a score \leq 3.2 indicates low disease activity (LDA; Smolen et al., 2014).

Traditionally, patients with RA are regularly monitored in specialized consultations, usually every 3 months, depending on whether disease activity is or is not controlled (Smolen et al., 2014). This follow-up is also influenced by the guidelines of the healthcare services in each country. However, recent studies have shown that in the case of patients with stable disease activity, that is, in remission or LDA, this follow-up can be performed by nurses with competencies in rheumatology whenever protocols are implemented and with the support of a rheumatologist, if necessary (Primdahl, Sorensen, Horn, Petersen, & Horslev-Petersen, 2014; Sorensen, Primdahl, Horn, & Horslev-Petersen, 2015). According to these protocols, the rheumatologist usually gives an annual consultation. One of these studies found that, after a 2-year follow-up, people who were followed every 3 months in nursing consultations (NCs) had their disease better controlled than people followed every 3-12

months in rheumatology consultations (RCs) and they also had shown better self-efficacy, confidence, and satisfaction (Primdahl, Wagner, Holst, & Horslev-Petersen, 2012). In this study, a third model of shared care between nurses and rheumatologists was also tested, in which people were followed-up by their general practitioner and rheumatology consultations (with the nurse and/or rheumatologist) were scheduled only when necessary. The level of satisfaction of this third group was only lower than the group followed-up in RCs (Primdahl et al., 2012).

In this context, the European League Against Rheumatism (EULAR) drew up recommendations for the role of the nurse in the management of chronic inflammatory diseases which emphasize the optimization of nurses' competencies and skills as part of an overall disease management (van Eijk-Hustings et al., 2012). Another consensus document from this organization strengthens the importance of promoting patient education and empowerment, namely for self-management, leading to improved therapeutic adherence (Zangi et al., 2015), which is an activity that is mostly performed by nurses and other healthcare professionals. This care model has also proved to contribute to reduce the costs associated with musculoskeletal diseases (Koksvik et al., 2013; Larsson, Fridlund, Arvidsson, Teleman, & Bergman, 2014; Larsson et al., 2015).

In several European countries, such as the United Kingdom, the Netherlands, Denmark, Sweden or Norway, NCs are perfectly implemented, particularly in this area, with results already published. However, their implementation has been difficult in several other countries due to various factors and differences in specialized training. This issue has been recently discussed by the clinical and academic community (Vliet Vlieland et al., 2016).

This systematic review aimed to compare the effectiveness of nursing consultations with the effectiveness of consultations performed only by a rheumatologist in people with RA. More specifically, this review focuses on the following question: What is the effectiveness of consultations performed by nurses in patients with RA regarding the control of disease activity (based on DAS28) and other patient-reported outcomes?

Systematic review method

This review followed the Cochrane guidelines (Higgins & Green, 2011). Selection criteria were established and applied according to the PICO methodology. Participants: Adults (≥ 18 years), with a definitive diagnosis of RA; Intervention: Consultations performed by nurses (NC); these are follow-up consultations, patients continue to have their usual annual consultations with the rheumatologist; Comparisons: Consultations performed exclusively by rheumatologists (RC); other shared care models, including unplanned consultations performed by nurses or rheumatologists (NC/RC); Outcomes - (Primary): disease activity; (Secondary): pain, fatigue, physical function, self-efficacy, therapy adherence, quality of life, and overall satisfaction.

Only studies with experimental designs,

including randomized controlled trials (RCTs), and cohort studies were selected.

Search strategy and study identification

A three-step search strategy was used, and only included published studies. Initially, a naturalistic search was conducted in the PubMed database, followed by an analysis of text words in titles, abstracts, and descriptors. Then, another search was carried out using all keywords and descriptors identified in all databases included (Table 1). Finally, the references of all identified articles were analyzed to identify additional studies. Studies written in English, Spanish, French, and Portuguese were considered for inclusion in this review. The database search was performed between 1 January 2005 (when studies on the topic started to emerge, based on several preliminary searches) and 31 August 2016.

Tabela 1

Fórmulas e limitadores da pesquisa aplicados por base de dados e os respectivos resultados

Database (results per database)	Boolean formula
Pubmed (71)	<p>("Arthritis, Rheumatoid"[Mesh] OR "Rheumatoid arthritis"[Title/Abstract]) AND ("Nurse's Role"[Mesh] OR "Nurse's role"[Title/Abstract] OR "Nursing consultations"[Title/Abstract] OR "shared care"[Title/Abstract] OR "Nurse-led rheumatology clinic"[Title/Abstract] OR "Multidisciplinary team-care"[Title/Abstract]) AND ("Education"[Mesh] OR "Patient Satisfaction"[Mesh] OR "Quality-Adjusted Life Years"[Mesh] OR "Quality of Life"[Mesh] OR "Pain"[Mesh] OR "Self Efficacy"[Mesh] OR "Fatigue"[Mesh] OR "Education"[Title/Abstract] OR "Patient satisfaction"[Title/Abstract] OR "Quality-Adjusted life years"[Title/Abstract] OR "Quality of life"[Title/Abstract] OR "Pain"[Title/Abstract] OR "Self-efficacy"[Title/Abstract] OR "Fatigue"[Title/Abstract] OR "Disease activity"[Title/Abstract] OR "Treatment Adherence"[Title/Abstract])</p> <p>After using filters: 46.</p>
EBSCO (CINAHL Complete; Cochrane Central Register of Controlled Trials; 52)	<p>(TX "Rheumatoid arthritis") AND (TX "Nurse's role" OR TX "Nursing consultations" OR TX "shared care" OR TX "Nurse-led rheumatology clinic" OR TX "Multidisciplinary team-care") AND (TX "Education" OR TX "Patient satisfaction" OR TX "Quality-Adjusted life years" OR TX "Quality of life" OR TX "Pain" OR TX "Self-efficacy" OR TX "Fatigue" OR TX "Disease activity" OR TX "Treatment Adherence")</p> <p>After using filters: 45.</p>
Embase (55)	<p>("rheumatoid arthritis"/exp OR "rheumatoid arthritis" AND ("multidisciplinary team-care" OR "nurse-led rheumatology clinic" OR "shared care" OR "nursing consultations" OR "nurse role")) AND ("education" OR "patient satisfaction" OR "quality-adjusted life years" OR "quality of life" OR "pain" OR "self-efficacy" OR "fatigue" OR "disease activity" OR "treatment adherence")</p> <p>Formula searched on the field [Title/Abstract].</p> <p>After using filters: 35.</p>

Methodological quality assessment of the studies

The methodological quality of the studies was assessed by two independent reviewers using three instruments: a grid for the critical appraisal of an article describing a prospective, randomized and controlled clinical trial, for RCTs, which considers quality studies as those with a score equal to or greater than 75% (Carneiro, 2008); the JBI Critical Appraisal Checklist for Cohort and Case-control studies for cohort studies (Joanna Briggs Institute, 2014), which considers *quality studies* as those that obtained up to two negative answers (set after consensus prior to the researchers' analysis as to preserve a score equal to or greater than 75% of positive answers, while maintaining the criterion of the previous instrument); and the Cochrane Collaboration's standardized critical appraisal instrument using the Cochrane Collaboration's software (RevMan 5.2.8) to create a summary table for the risk of bias.

Data extraction

Data were extracted by the same two reviewers, using the Joanna Briggs Institute data extraction form for systematic review of experimental/ observational studies. Data included information on the participants' characteristics, the intervention's characteristics, the study methods, and the relevant results of the outcomes assessed.

Data synthesis

The impact of monitoring disease activity, as measured by the Disease Activity Score (DAS28), after a 1-year follow-up (standard available period), was grouped into a meta-analysis using the software RevMan 5.2.8. All results were entered twice (double entry). Results were expressed as mean differences (MD), with 95% confidence intervals, using the inverse-variance method and the random effects model. As these were continuous data, whenever it was not reported in the studies, the standard deviation (SD) was calculated based on the following formula: $SD = \sqrt{N \times (\text{upper limit} - \text{lower limit}) / 3.92}$ (Higgins & Green, 2011; Santos, Ferreira, & Marques, 2016). All other outcomes were described in narrative format.

Presentation of results

The search identified 181 potentially relevant studies, as shown in Figure 1. Of these, 52 were excluded after the search limiters were applied and 26 after the removal of duplicates; of the remaining 103 studies, 78 were excluded after assessing the title and abstract; 18 of the remaining 25 articles were excluded because they did not meet the inclusion criteria after full-text reading. The methodological quality of the remaining 7 studies was assessed and they were included in this review. Only four studies were included in the meta-analysis.

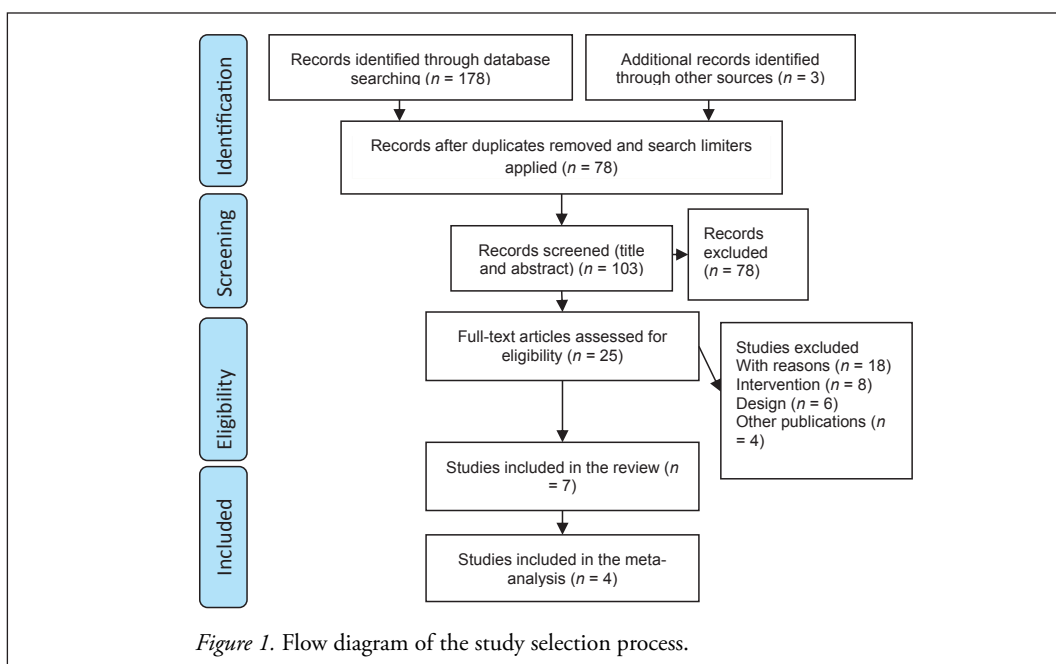
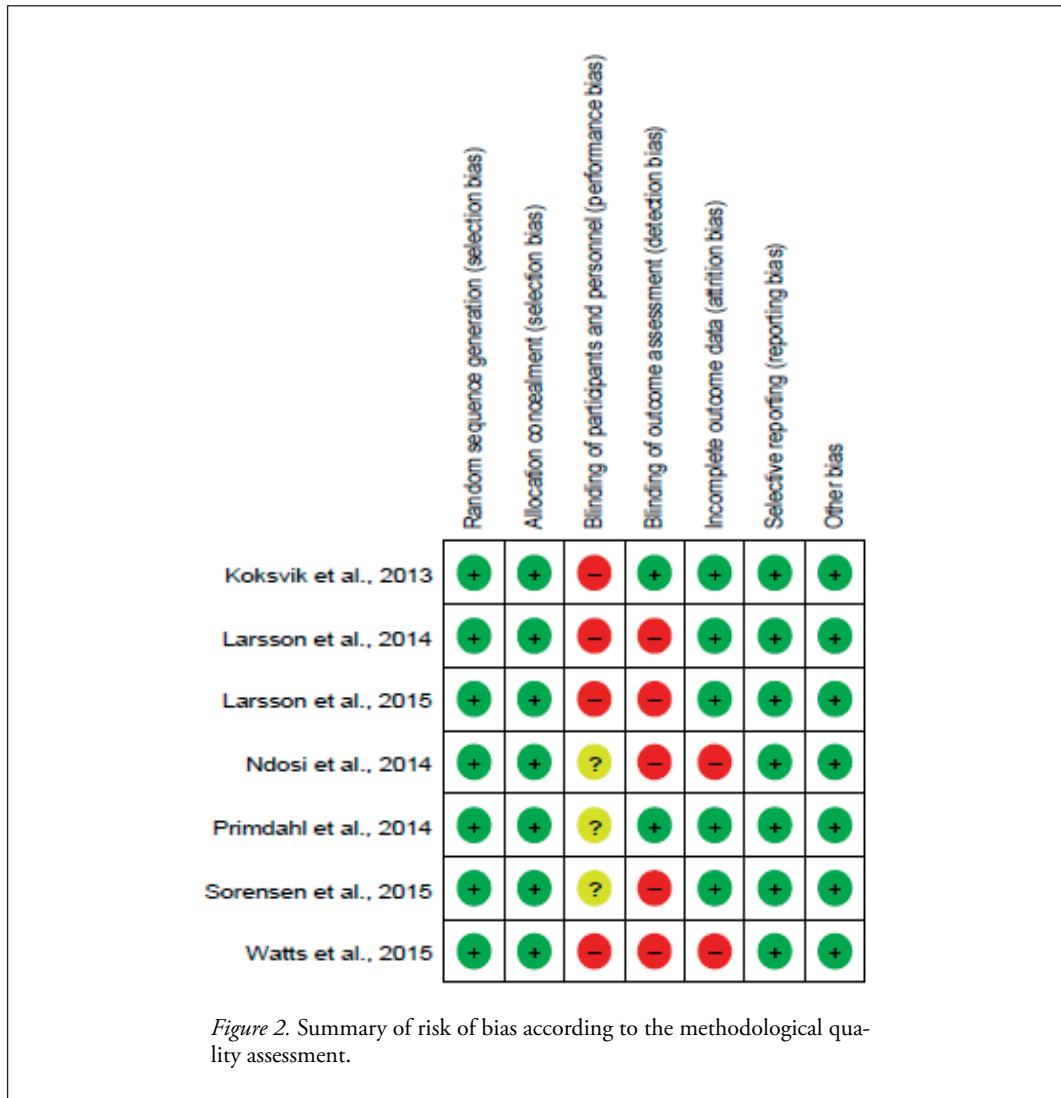


Figure 1. Flow diagram of the study selection process.

Figure 2 shows the results of the consensus on the methodological quality, in which interrater agreement of 87.75% was obtained. In most studies, neither the participants nor the

outcomes were blinded. However, we consider that blinding would be impossible due to the nature of the study object, thus there is no risk of bias in the analysis performed.



The included studies were conducted in one, two, or more centers (up to 10) in the same European country and were published between 2013 and 2015. The majority of studies (Larsson et al., 2014; Primdahl et al., 2014; Sorensen et al., 2015) set a DAS28 ≤ 3.2, that is, patients in remission or low disease activity, as one of the inclusion criteria, among others.

The size of the samples included in this review ranged between 68 and 349 participants. Additional information was requested on statistical data to the authors of an included study (Primdahl et al., 2014). Table 2 shows the methods, participants' characteristics, interventions, and conclusions of the included studies, as well as the final score of the critical quality appraisal.

Table 2
Characteristics of the included studies

Author, Year (Country)	Study design/ Population	Interventions	Outcomes	Conclusions	Critical quality appraisal
Koksvik et al., 2013 (Norway)	RCT/68 patients with chronic inflammatory arthritis, of whom 35 people (53%) had RA	Experimental: NC ($n = 35$), of whom 19 patients had RA Control: RC ($n = 33$), of whom 17 patients had RA	Statistically significant differences in patient satisfaction (LSQ; $p < 0.05$); Improved disease activity (DAS28; $p = 0.03$) and patient global assessment (PGA; $p = 0.05$) at 9 months; The control group was poorly satisfied with the provision of information and with the access and continuity of care ($p < 0.01$).	Patients being followed in NC improved their knowledge of the disease process, treatment strategies, and self-management strategies.	85%
Larsson et al., 2014 (Sweden)	RCT /107 patients with chronic inflammatory arthritis, of whom 60 (56%) had RA	Experimental: NC ($n = 47$), of whom 25 patients had RA Control: RC ($n = 50$), of whom 35 patients had RA	No statistically significant differences in disease activity (DAS28), physical function (HAQ), pain (VAS), satisfaction and confidence (NRS).	NC are as safe and effective as RC.	80%
Larsson et al., 2015 (Sweden) ^a	RCT / 107 patients with chronic inflammatory arthritis, of whom 60 (56%) had RA	Experimental: NC ($n = 47$), of whom 25 patients had RA Control: RC ($n = 50$), of whom 35 patients had RA	Statistically significant differences in the reduction of resources used and costs ($p = 0.004$).	Patients with RA can be monitored by nurses, with reduced costs and resource use, with no difference in clinical outcomes.	80%
Ndosi et al., 2014 (United Kingdom)	RCT / 181 patients with RA	Experimental: NC ($n = 91$) Control: RC ($n = 90$)	Improved disease activity (DAS28; $p < 0.002$); improved pain management and physical function (HAQ; $p < 0.001$), being more cost-effective ($p < 0.001$); Slight worsening in fatigue (VAS), morning stiffness, anxiety ($p < 0.05$), and depression ($p < 0.01$).	Nurses can provide care without loss of efficacy and with increased satisfaction.	80%

Primdahl et al., 2014 (Denmark)	RCT / 287 patients with RA	Experimental: NC (<i>n</i> = 94) Experimental 2: NC/RC (<i>n</i> = 96) Control: RC (<i>n</i> = 97)	No statistically significant differences in disease activity (DAS28); Experimental group 2 showed low disease activity (<i>p</i> = 0.049), increased self-efficacy (<i>p</i> = 0.001), and increased satisfaction (<i>p</i> < 0.001).	Shared care can be safely implemented and follow-up care in patients with RA can be performed by nurses.	90%
Sorensen et al., 2015 (Denmark) ^b	RCT / 287 patients with RA	Experimental: NC (<i>n</i> = 94) Experimental 2: NC/RC (<i>n</i> = 96) Control: RC (<i>n</i> = 97)	Both experimental groups had higher quality of life scores (EQ-5D).	NC and NC/RC are less expensive and provide similar health outcomes when compared to those obtained with classical monitoring (RC).	85%
Watts et al., 2015 (United Kingdom)	Cohort study / 349 patients with RA	Experimental: NC in primary health care (<i>n</i> = 195) Control: RC at the hospital (<i>n</i> = 154)	Physical function (HAQ) and quality of life (EQ-5D) have lower scores when compared to the control group, but the differences are not statistically significant.	Community care is associated with higher costs, suggesting a low cost-effectiveness.	9 points

LSQ = Leeds Satisfaction Questionnaire; DAS28 = Disease Activity Score 28; PGA = Patient Overall Assessment; HAQ = Health Assessment Questionnaire; VAS = Visual Analogue Scale; NRS = Numerical Rating Scale; EQ-5D = EuroQol five dimensions health questionnaire; NC = nursing consultations; RC = rheumatology consultations; NC/RC = unscheduled consultations given by nurses or rheumatologists; RA = rheumatoid arthritis; RCT = randomized controlled trial; ^a Publication derived from the study by Larson et al. (2014). ^b Publication derived from the study by Primdahl et al. (2014).

Meta-analysis of the results

Only four of the seven studies included in data synthesis were eligible for meta-analysis, resulting in a total of 528 patients.

The meta-analysis and forest plot analysis (Figure 3) show that, after a 1-year follow-up, the patients in the NC group improved their

control of disease activity (DAS28), which, despite not being significant, is corroborated by the meta-analytical score (MD = -0.13; 95% CI = -0.30-0.05; *p* = 0.15). The heterogeneity study showed that it is not statistically significant (Tau² = 0.00, χ^2 = 0.85, *df* = 3, *p* = 0.84; *I*² = 0%).

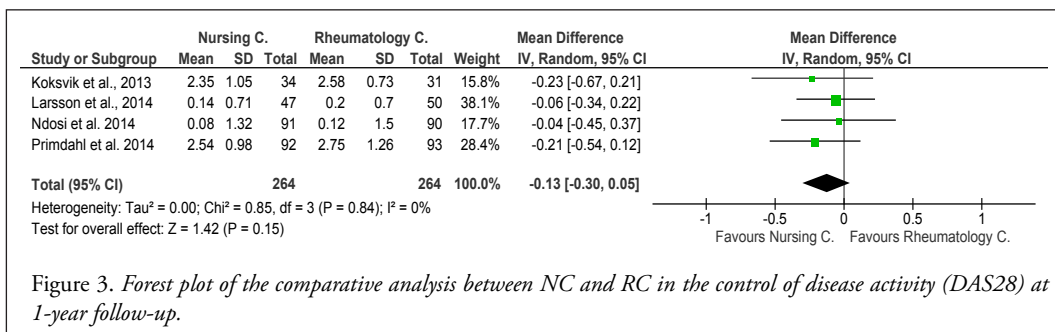


Figure 3. Forest plot of the comparative analysis between NC and RC in the control of disease activity (DAS28) at 1-year follow-up.

Interpretation of results

Although patients with RA are traditionally monitored in regular physician consultations (Primdahl et al., 2014; Sorensen et al., 2015), several studies and the narrative synthesis have shown positive effects when this follow-up is also performed by nurses, particularly in physical function, quality of life, pain (Ndosi et al., 2014), and overall satisfaction (Koksvik et al., 2013; Ndosi et al., 2014; Primdahl et al., 2014). In addition to these results, *non-inferiority* is still evident (the differences are not statistically significant) in NC when compared to RN regarding, for example, the outcomes: disease activity, physical function (Larsson et al., 2014; Primdahl et al., 2014; Sorensen et al., 2015), fatigue (Koksvik et al., 2013; Primdahl et al., 2014), quality of life (Koksvik et al., 2013; Primdahl et al., 2014; Sorensen et al., 2015), and pain (Koksvik et al., 2013; Larsson et al., 2014; Primdahl et al., 2014). The results of the narrative synthesis suggest no significant differences in the control of disease activity (DAS28) when comparing NC with RC or unplanned shared consultations (NC/RC), and even showed benefits, although without reaching statistical significance level. The results also suggest that people are more *satisfied* with NC. Unfavorable results were reported only for the outcomes *physical function* (Watts et al., 2015) and *fatigue* (Ndosi et al., 2014) in the NC group. It should be noted that most outcomes were not grouped into a meta-analysis due to high levels of statistical, clinical, and methodological heterogeneity. Therefore, in what concerns the meta-analysis, it was only possible to compare NC and RC on the control of disease activity (DAS28) after a 1-year follow-up. With regard to the limitations, we found

incomplete data because the researchers of some of the included studies did not use blinding and did not always follow the statistical recommendations. However, all studies were considered having quality studies (inclusion criteria) and subjected to the above-mentioned instruments.

This review also has limitations such as the no inclusion of unpublished studies, the limited number (although specific, taking into account the topic under analysis) of searched databases, and, finally, the fact that two of the included studies were conducted with people with inflammatory arthritis other than RA. These latter studies were, nonetheless, included because (i) all of these diseases have an inflammatory joint component, and are even collectively considered in several recommendations, such as van Eijk-Hustings et al. (2015) and Sar et al. (2015); (ii) people with RA represented more than half of the samples; (iii) these studies had the smallest samples and, consequently, less impact on the analyses; and (iv) the inclusion of these studies did not affect the sensitivity analysis or the levels of heterogeneity obtained (there was no statistically significant heterogeneity).

Conclusion

The analysis of all included studies and the meta-analysis results show that there is no significant difference in the control of disease activity (DAS28) in people with RA who were followed-up by a nurse vs. a rheumatologist. Indeed, there is even an increasing trend to focus on the benefits of NC in this and in other dimensions (pain, physical function, quality of life, self-efficacy, or overall satisfaction).

This evidence supports the understanding that, with the rheumatologists' collaboration, nurses are effective in monitoring people with RA, especially those with low disease activity. These nurses should also possess specialized rheumatology skills. This practice is already advocated internationally.

Implications for practice

NC are as effective as RC in the control of disease activity (DAS 28) in people with RA (Level of evidence 1.b - Systematic review of randomized clinical trials and with other study designs).

The quality of the body of evidence was analyzed based on the Grading of Recommendations Assessment, Development and Evaluation approach (<http://www.gradeworkinggroup.org>), decreasing the quality rating by one level (moderate quality) due to the analysis of the following factors: i) Limitations in the design and implementation – Possibly, in the practical implementation of the consultations, the different levels of nurses' specialized training in the different European countries should be taken into account; (ii) Indirectness of evidence – Possibly, the intervention was implemented by experts and highly trained experts in specialized centers; (iii) Heterogeneity and inconsistency – Not observed; iv) Imprecision of results – Not observed; v) Publication bias – Not observed (due to the number of studies, the funnel plot is not recommended). In addition, no quality increasing factors were found (confounding factors, dose-response gradient, and large magnitude of effect).

Thus, based on these notions, we can say that healthcare professionals can implement these interventions in the treatment of adults (Grade B Recommendation).

We emphasize that the Summary of Findings Table is not included here due to the nature of this publication.

Implications for research

More high-quality RCTs are needed to support the existing evidence and update the meta-analyses on nursing-sensitive outcomes. Future studies should describe patient-reported outcomes in a standardized way to facilitate their integration into meta-analyses.

Further studies with long-term outcomes are also needed.

In addition, we recommend the performance of meta-analysis on cost-effectiveness and safety (side effects) because we found some primary studies in this area which, in a preliminary analysis, showed that NC and NC/RC are less expensive than RC and have similar safeness.

Acknowledgements

The authors would like to thank Joana Fonseca Ferreira, a rheumatologist in the Local Health Unit of Guarda, E.P.E., and Mariana Galante Santiago, a rheumatologist in the Coimbra Hospital and University Center, E.P.E., for their critical revision of the article and constructive comments.

References

- Boonen, A., & Severens, J. L. (2011). The burden of illness of rheumatoid arthritis. *Clinical Rheumatology*, *30*(sup.1), S3-8. doi:10.1007/s10067-010-1634-9
- Branco, J. C., Rodrigues, A. M., Gouveia, N., Eusébio, M., Ramiro, S., Machado, P. M., ... EpiReumaPt Study Group. (2016). Prevalence of rheumatic and musculoskeletal diseases and their impact on health-related quality of life, physical function and mental health in Portugal: Results from EpiReumaPt— a national health survey. *RMD Open*, *2*(1), e000166. doi:10.1136/rmdopen-2015-000166
- Carneiro, A. V. (2008). Como avaliar a investigação clínica: O exemplo da avaliação crítica de um ensaio clínico. *Journal Portuguese Gastroenterology*, *15*, 30-36. Retrieved from <http://www.scielo.mec.pt/pdf/ge/v15n1/v15n1a07.pdf>
- Ferreira, R. J., Dougados, M., Kirwan, J., Duarte, C., de Wit, M., Soubrier, M., ... Gossec, L. (in press). Drivers of patient global assessment in patients with rheumatoid arthritis who are close to remission: An analysis of 1588 patients. *Rheumatology* doi:10.1093/rheumatology/kex211
- Gabay, C., Nissen, M. J., & van Laar, J. M. (2015). Rheumatoid arthritis: Pathogenesis and clinical features. In J. W. J. Bijlsma & E. Hachula (Eds.), *Textbook on rheumatic diseases* (2nd ed., pp. 229-264). London, England: BMJ Publishing Group.
- Higgins, J., & Green, S. (2011). *Cochrane handbook for systematic reviews of interventions: Version 5.1.0*. Retrieved from <http://handbook.cochrane.org/>
- Joanna Briggs Institute. (2014). *Joanna Briggs Institute reviewers' manual: 2014 edition*. Adelaide, Australia:

Author.

- Koksvik, H. S., Hagen, K. B., Rodevand, E., Mowinkel, P., Kvien, T. K., & Zangi, H. A. (2013). Patient satisfaction with nursing consultations in a rheumatology outpatient clinic: A 21-month randomised controlled trial in patients with inflammatory arthritides. *Annals Rheumatic Diseases*, 72(6), 836-843. doi:10.1136/annrheumdis-2012-202296
- Larsson, I., Fridlund, B., Arvidsson, B., Teleman, A., & Bergman, S. (2014). Randomized controlled trial of a nurse-led rheumatology clinic for monitoring biological therapy. *Journal of Advanced Nursing*, 70(1), 164-175. doi:10.1111/jan.12183
- Larsson, I., Fridlund, B., Arvidsson, B., Teleman, A., Svedberg, P., & Bergman, S. (2015). A nurse-led rheumatology clinic versus rheumatologist-led clinic in monitoring of patients with chronic inflammatory arthritis undergoing biological therapy: A cost comparison study in a randomised controlled trial. *BMC Musculoskeletal Disord*, 16, 354. doi:10.1186/s12891-015-0817-6
- Ndosi, M., Lewis, M., Hale, C., Quinn, H., Ryan, S., Emery, P., ... Hill, J. (2014). The outcome and cost-effectiveness of nurse-led care in people with rheumatoid arthritis: A multicentre randomised controlled trial. *Annals Rheumatic Diseases*, 73(11), 1975-1982. doi:10.1136/annrheumdis-2013-203403
- Primdahl, J., Sorensen, J., Horn, H. C., Petersen, R., & Horslev-Petersen, K. (2014). Shared care or nursing consultations as an alternative to rheumatologist follow-up for rheumatoid arthritis outpatients with low disease activity-patient outcomes from a 2-year, randomised controlled trial. *Annals Rheumatic Diseases*, 73(2), 357-364. doi:10.1136/annrheumdis-2012-202695
- Primdahl, J., Wagner, L., Holst, R., & Horslev-Petersen, K. (2012). The impact on self-efficacy of different types of follow-up care and disease status in patients with rheumatoid arthritis--a randomized trial. *Patient Education Counseling*, 88(1), 121-128. doi:10.1016/j.pec.2012.01.012
- Santos, E. J., Ferreira, R. J., & Marques, A. A. (2016). How to perform and interpret a network meta-analysis for indirect and mixed comparisons: Key methodological strategies. *Revista Enfermagem Referência*, 4(8), 133-140. doi:10.12707/RIV15055
- Smolen, J. S., Landewe, R., Breedveld, F. C., Buch, M., Burmester, G., Dougados, M., ... van der Heijde, D. (2014). EULAR recommendations for the management of rheumatoid arthritis with synthetic and biological disease-modifying antirheumatic drugs: 2013 update. *Annals Rheumatic Diseases*, 73(3), 492-509. doi:10.1136/annrheumdis-2013-204573
- Sorensen, J., Primdahl, J., Horn, H. C., & Horslev-Petersen, K. (2015). Shared care or nurse consultations as an alternative to rheumatologist follow-up for rheumatoid arthritis (RA) outpatients with stable low disease-activity RA: Cost-effectiveness based on a 2-year randomized trial. *Scandinavian Journal of Rheumatology*, 44(1), 13-21. doi:10.3109/03009742.2014.928945
- van Eijk-Hustings, Y., van Tubergen, A., Boström, C., Braychenko, E., Buss, B., Felix, J., ... Hill, J. (2012). EULAR recommendations for the role of the nurse in the management of chronic inflammatory arthritis. *Annals of the Rheumatic Diseases*, 71(1), 13-19. doi:10.1136/annrheumdis-2011-200185
- Vliet Vlieland, T. P., van den Ende, C. H., Alliot-Lainois, F., Beauvais, C., Gobbo, M., Iagnocco, A., ... Wiek, D. (2016). Educational needs of health professionals working in rheumatology in Europe. *RMD Open*, 2(2), e000337. doi:10.1136/rmdopen-2016-000337
- Watts, R. A., Mooney, J., Barton, G., MacGregor, A. J., Shepstone, L., Irvine, L., & Scott, D. G. (2015). The outcome and cost-effectiveness of nurse-led care in the community for people with rheumatoid arthritis: A non-randomised pragmatic study. *BMJ Open*, 5(8). doi:10.1136/bmjopen-2015-007696
- Zangi, H. A., Ndosi, M., Adams, J., Andersen, L., Bode, C., Bostrom, C., ... Gossec, L. (2015). EULAR recommendations for patient education for people with inflammatory arthritis. *Annals of the Rheumatic Diseases*, 74(6), 954-962. doi:10.1136/annrheumdis-2014-206807