

# Review of effects of joint protection education program for patients with rheumatoid arthritis

## Abstract

**Objectives:** this study was conducted to review the evidence available regarding the effects and benefits of Joint Protection (JP) education program for patients with Rheumatoid Arthritis (RA).

**Results:** reviewed evidence reported that the subjects benefited out of the JP program and presented less pain and disability and thus an enhanced health status. Therefore, this approach may efficiently compliment drug therapy. We also found significant improvements for those who attended JP program in the use and knowledge of JP principles, adherence, reduced early morning stiffness, and improved Activities of Daily Living (ADL) functional ability.

**Conclusion:** our review supported JP principles and summarized that subjects with RA benefited with JP, resulting in pain reduction, better joint adherence, and reduction in stiffness and better ADL functional ability.

**Keywords:** joint protection, rheumatoid arthritis, functional ability, energy conservation, rehabilitation, occupational therapy

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## Introduction

“Rheumatoid Arthritis (RA) is a chronic disabling disease characterized by chronic inflammation of joints that, in most patients, results in progressive joint destruction with deformities and various degrees of limitation in activities of daily living.”<sup>1</sup> RA has many adverse effects on health and social well being due to its exacerbation’s and remissions. These courses are influenced by different drugs and other factors.<sup>2</sup> Treatments of RA include: drug therapy, intensive exercise,<sup>3</sup> and educational- behavioral programs. A variety of well established education programs like the Joint Protection (JP) program can be helpful as a part of the treatment.<sup>1</sup>

“Joint protection is widely provided as a part of the management of people with rheumatoid arthritis.”<sup>4</sup> JP education program includes exercises along with proper joint positioning techniques, energy conservation, use of orthoses and assistive device and other ergonomic measures. JP helps to reduce joint inflammation, pain, and preserve joint integrity.<sup>5</sup> Joint protection education mainly includes educating the patient about the disease, effects of RA on joints, factors influencing development of deformities, a brief about joint protection principles and its demonstration.<sup>6</sup>

Attending a JP program and following its principles will improve patient’s joint adherence and maintain functional ability.<sup>7</sup> A study reported that “Patient education should become part of other team – related efforts and thus an integrated part of total management of RA”<sup>8</sup> Besides, another study by Hammond, Lincoln and Sutcliffe<sup>6</sup> concluded that JP is an effective program to be widely adopted in clinical practice. However, to make joint protection educational programs more beneficial to the patients, a positive behavioral change should occur along with increasing their knowledge about the disease itself.<sup>9</sup>

The purpose of this study was to review the evidence provided by various authors regarding the effects and benefits of Joint Protection

education program for patients with Rheumatoid Arthritis. The PICO question (population, intervention, comparison, and outcome) formed for the purpose of our study is as follows:

- (P) For patients with Rheumatoid arthritis
- (I) Do programs focused on Joint Protection (JP)
- (C) Compared to arthritis education program studies that include JP, a pharmaceutical control group, or no control group
- (O) Enhance use of JP principles, knowledge of JP principles, functional ability and decrease pain.

## Methods

### Review of literature and search strategy

A research has been made in the following databases: Ovid (MEDLINE, PsychINFO, and Global Health), and CINAHL. Keywords and Search items used to search articles for our study were rheumatoid arthritis, Joint protection education, arthritis education program, joint protection principles. By combining the search results we found many articles on rheumatoid arthritis and joint protection. Based on the format of PICO question, three most relevant articles were selected for our study. Studies cited in the reference of the three articles along with other articles were also used to collect important information.

## Results

The three selected articles were related to effects of joint protection program on people with rheumatoid arthritis, which is in co-ordination with our PICO question. A summary of the 3 selected articles based on the most recent article published first is as follows.

The first study by Masiero et al.,<sup>1</sup> level II Randomized controlled trial study, investigated the effects of joint protection education program on people with RA. Out of 91 eligible subjects diagnosed

with RA, 85 remained for the study and were randomly assigned to Control Group (CG) and Experimental Group (EG). CG consisted of 39 subjects who received only anti TNF drugs (infliximab) and no occupational therapy or other additional treatment. EG consisted of 46 subjects who received drug treatment as well as educational behavioral JP program. The EG group had three hour sessions of the JP program which was developed by an interdisciplinary team of rheumatologist, occupational therapist and physiotherapist. The sessions included pathophysiology of RA, mechanisms and control of pain and stress and home exercise program. Evaluation was conducted at baseline and after 8 months. The authors reported significant difference in pain reduction ( $p=0.001$ ) which was measured using the 100mm Visual Analogue Scale (VAS) in the EG compared to the CG. The authors also reported significant improvement in the EG in the Arthritis impact measurement Scale 2 (AIMS2) in the physical ( $p=0.000$ ), symptoms (0.049), and social interaction (0.045) subscales but not in the work and psychological dimension subscale. They also reported that the EG did better than the CG in the Health Assessment Questionnaire (HAQ), ( $p=0.000$ ). 75% of the EG population were satisfied by the education program. However the authors did not find any significant difference in the Ritchie Articular Index (RAI) between both the groups. The authors concluded that the subjects benefited out of the JP program and “presented less pain and disability and thus an enhanced health status. This approach may efficiently compliment drug therapy”. (p. 2043).<sup>1</sup>

The objectives of the second study by Hammond et al.,<sup>4</sup> a level II Randomized controlled trial study, was to “evaluate whether joint protection can reduce pain and local inflammation and maintain the integrity of joint structures and functional ability of people with RA 1yr after attending an educational –behavioural joint protection programme” (p.1045). Subjects diagnosed with RA were randomly assigned in two groups: The Standard Education Program (SP) and the Educational- behavioural joint protection program group (JP). The SP included 8 hours of education program with 2.5 hours of joint protection education, alternative therapies, drug treatment, and exercise, methods to control pain, relaxation techniques and assistive devices. The JP group included 8 hours of educational behavioural joint protection, self efficacy strategies, motor learning, methods to increase adherence to joint protection program, booklets and pictorial representations of joint protection techniques and information related to RA. The evaluations were performed at baseline, at 6 months and after 12 months. The authors reported significant reduction in pain in the JP group as compared to the SP ( $p=0.02$ ) in VAS. They also reported significant use of joint protection in the JP group in the Joint Protection Behavior assessment (JPBA) measure ( $p=0.001$ ). In the Assessor’s global disease status, the JP group did significantly better than the SP at 12 months, ( $p=0.03$ ). The JP group did significantly better than the SP in AIMS2, ( $p=0.03$ ). The SP did not show any significant improvement. However the authors did not report any significance difference in the disease activity, hand status (the grip strength and joint alignment and motion) between both the groups, but the authors mention a significant improvement in all scales at the end of 12 months within the JP group. The authors concluded that JP group improved at the end of 12 months where as the SP group maintained or slowly worsened. The authors found “significant improvements for those who attended JP programme in the use of JP principles, adherence, reduced pain, reduced early morning stiffness, improved ADL functional ability and assessor patient ratings of the disease status” (p.1049).

The aim of the third study article by Hammond et al.<sup>5</sup> Level III repeated measures design/ pre post cohort study, was “to evaluate the effects of an education programme in improving adherence with joint protection by people with RA” (p.392). Subjects diagnosed with RA were included in 2 sessions of joint protection education program for 2 hours. The sessions included information of the disease, the anatomy of hand joints, significance of RA on hand joints, energy conservation, problem solving, demonstration of techniques in kitchen activities and practicing the joint protection techniques. Evaluations were made 6 weeks before, 1 week before, at baseline, 6 weeks after, and 12 weeks after. The authors reported no major significant improvement in pain or functional status in the JPBA ( $p=0.28$ ), tender hand joint counts ( $p=0.63$ ), VAS ( $p=0.29$ ), HAQ questionnaire ( $p=0.49$ ), and pain scale ( $p=0.74$ ), and interviews ( $p=0.82$ ), before and after education. They noted a significant difference in the 20-item multiple choice joint protection item questionnaire after education ( $p=0.01$ ). The authors concluded that “the joint protection education program improved knowledge, but not use of taught methods” (p.398) (Table 1).

## Discussion

Two articles were level II articles, and one was level III. After reviewing the level of evidence, and the number of subjects, the Hammond et al.,<sup>4</sup> article was chosen for the study as the strongest evidence. It has the largest number of subjects and better group interactions. The article supported JP principles and summarized that subjects with RA benefited with JP, resulting in pain reduction, better joint adherence, and reduction in stiffness and better ADL functional ability. Thus clinical guidelines, recommendations, a plan and audit tool have been developed in our study to implement JP principles in clinics. The clinical guidelines for recommended intervention, the plan, and the audit tool recommend therapists to use joint protection education and techniques with patients with Rheumatoid arthritis (Appendices A and B).

## Conclusion

Our review supported JP principles and summarized that subjects with RA benefited with JP, resulting in pain reduction, better joint adherence, and reduction in stiffness and better ADL functional ability. Thus clinical guidelines, recommendations, a plan and audit tool have been created in our study to implement JP principles in clinics. The clinical guidelines for recommended intervention, the plan, and the audit tool recommend therapists to use JP education and techniques with patients with RA.

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## Conflict of interest

The author declares no conflict of interest.

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## Appendix A

### Clinical Guidelines and Recommendations for Use of Joint Protection Techniques in Patients with Rheumatoid Arthritis

The effects of JP on RA were supported by the evidence article by Hammond et al.<sup>4</sup> Thus JP intervention techniques can be recommended in clinics based on the health belief model, self management, and the theories of social learning. Target population should include patients diagnosed with RA. All occupational therapists should be certified by attending programs and workshops on joint protection technique. After therapists prove their competency in JP educational program, they can include JP as a part of treatment program with patients diagnosed with RA.

Evidence in support of the above clinical guidelines is as follows:

#### Intervention technique

Joint Protection (JP) education program that can apply a variety of educational, behavioral, and motor learning methods for the convenience of the different learning styles of group members and in order to increase the adherence to the program.

#### Evidence article:

Hammond A, Freeman K.<sup>4</sup> One-year outcomes of a randomized controlled trial of an educational-behavioural joint protection programme for people with rheumatoid arthritis. *Rheumatology*. 2001;40:1044–1051.

#### Level of significance

Level II Randomized Control Trial (RCT)

#### Target population

Subjects diagnosed with mild to moderate Rheumatoid Arthritis. These patients should be able to follow verbal instructions, pictorial instruction on JP techniques.

#### Inclusion criteria

Subjects between 18 and 65years old diagnosed with mild to moderate RA, experiencing hand pain during any activity, and a history of metacarpophalangeal (MCP) or wrist joint pain and inflammation.

#### Exclusion criteria

Other diagnoses affecting hand function.

#### Intervention

A certified occupational therapist will receive training in use of JP techniques, and implement these techniques to patients with RA.

#### Tasks should include:

- Information about RA (knowledge about the disease, pathophysiology, disease process including the joint damage and deformity, possible outcomes of RA, drug therapy)
- Information pack and workbook with photographs on joint protection principles
- Demonstration of some hand-joint protection methods applied to make a cup of tea
- Practice the joint protection principles with blocked repetition of single action, succeeding to activities requiring several joint protection methods and mental rehearsal
- Home exercises which include homework tasks to identify problem activities; finding solutions to common household gardening and work difficulties, using the principles taught; repetition of principles.
- Practice activity in groups with the opportunity to try assistive kitchen devices
- The intervention can be divided in two parts. Part one includes information about RA, principles of JP, energy conservation, and home work tasks including identification of problems and finding solution. Part two includes discussion of the homework tasks, finding solutions to other household difficulties like gardening and work related difficulties, repetition, demonstration of techniques, group practice. A variety of methods for performing tasks can be used for patient's convenience. Patients should be encouraged to maintain a workbook and write goals and feedback should be given on the goals.

#### Schedule

Subjects will be seen for a total of 8hours, 4 sessions of 2hours during the outpatient rehabilitation.

#### Outcome measures

Patients will be evaluated for hand pain using the VAS. Adherence with joint protection will be measured using the JPBA. The grip strength will be measured using the Jamar dynamometer. Range of motion of hand was evaluated using the Joint Alignment Motion scale (JAM).

**Recommendations**

The recommendations were selected from our strongest evidence. Additionally, other recommendations were taken from the two other articles.

*Recommendations from the strongest evidence (Hammond & Freeman, 2001)<sup>4</sup>*

- A certified occupational therapist can attend workshop on JP, and should show competence in JP techniques
- The authors in the evidence article recommend use of video tapes
- Another suggestion is to provide a brief introduction to joint protection supported by a booklet
- In addition, one hour education about JP can be conducted with motivated patients
- *Recommendations from the other two articles*
- The use of a diary was recommended for feedback and support during the follow-up period. A group participation was also recommended<sup>1</sup>
- Therapists can use a variety of teaching methods including greater time allocation, repeated demonstration, supervised practice, simplifications, & feedback about methods taught. Besides, they recommended using the JP principles as a preventative measure, and not only when experiencing pain<sup>5</sup>

**Appendix B**

**Implementation of joint protection education program (Plan/Audit Tool)**

In order to implement the proposed intervention properly, the following plan should be applied. A summary of recommendations, plan, and audit is provided in Table 1.

1. An occupational therapist will attend workshops on JP education principles and practice the principles before applying it to the patients. In order to establish competency, the occupational therapist will answer a questionnaire on JP and obtain a certificate to practice JP.

2. Physicians referring a patient with RA will be given a brief knowledge (hand-outs) about the intervention plan based on the evidence article. The physicians will be asked their opinion regarding the intervention
3. The department of OT should conduct presentations provided by the qualified therapist on JP for all new therapists, and should be affiliated with current JP principles. The therapists should answer questions related to JP and must score a minimum of 90%. They will have to re-attend the presentation if they get a score less than 90%.
4. The OT director should have a record of all the certificates of attendance of all therapists
5. The therapists must demonstrate each principle before educating the client. This can be done by asking the therapist to answer a quiz or a questionnaire on JP principles or demonstrate at least the basic principles, to the certified therapist. The OT manager must maintain a record of the therapist performance along with the certificate previously provided. The incompetent therapist must re attend the presentation along with the certified therapist, and should not practice JP until competence is proved.
6. The evaluating therapist will follow a check list to find out if patients met the following criteria: Inclusion: Subjects between 18 and 65years old diagnosed with mild to moderate RA, experiencing hand pain during any activity, and a history of metacarpophalangeal (MCP) or wrist joint pain and inflammation Exclusion: other conditions affecting the hand.
7. The department should also have an educational booklet with pictorial instructions on JP principles and their use should be mandated on all patients with RA. The clients will be provided an educational videotape along with a booklet on JP principles.
8. The therapist must document use of JP after each session with the client.
9. On completion of intervention, the therapist will administer the VAS and JPBA and also measure the grip strength to note the effects of intervention at the baseline, and at the end of 6months and 12months respectively. Improvement in pain scores and JPBA scores at the end of 12months will establish effectiveness of JP on RA patients.
10. The clients will be asked to maintain a diary on daily basis to write down practiced techniques and activities
11. The clients will be rescheduled for follow-up purposes after 6-12months
12. The clients will be interviewed and provided with a questionnaire to measure their behavioral change and level of satisfaction.

**Table 1** A summary of recommendations, plan, and audit tool

Recommendation	Implementation plan	Criteria	Audit method	Compliance plan
1. A qualified outpatient OT will attend a workshop on JP principles.	The OT manager can enroll the therapist to attend the workshop.	The workshop will be attended and the OT should pass and obtain a score of 100% and a certificate of competence.	The certificate should be provided to the OT manager within 1 week.	If the therapist does not provide a certificate within a week, the OT manager will make arrangements for the therapist to attend the workshop again.

Table Continued

Recommendation	Implementation plan	Criteria	Audit method	Compliance plan
2. Physicians will be given a brief knowledge about the intervention plan.	The therapist will provide hand out (brochure) including JP principles to the physician.	The physician will be asked to give their opinion about JP within 3days.	The therapist must maintain a file and document all comments and reviews obtained from physicians.	If the physician does not provide their feedback, the therapist will remind the physician again.
Recommendation	Implementation plan	Criteria	Audit method	Compliance plan
3. The qualified therapist will provide presentation to other therapists in the clinic.	The OT manager should conduct presentations (in house training) on JP in the OT department for all new therapists.	All therapists should answer a questionnaire provided after the presentation and have a minimum score of 90% to get a certificate.	The OT manager should maintain a certificate of attendance for all therapists.	If the certificate is not provided, the therapist/therapists must re attend further presentations related to JP education program.
4. The therapist will identify appropriate target population (clients with RA)	The therapist will follow a checklist for patients to meet a criterion.	All patients in the study must meet 100% of the inclusion and exclusion criteria presented in the evidence article by Hammond & Freeman, 2001.	The OT manager can review the checklist used by the therapist, in every scheduled meetings.	If the checklist does not meet the criteria, the OT manager will schedule meetings to identify problems and develop a strategy.
5. The therapist treating a client must demonstrate each principle before educating the client.	The therapist should demonstrate at least the basic principles to the certified therapist and the OT manager.	The therapist must perform the basic principles 100% accurately.	The OT manager must maintain a record of the therapist performance along with the certificate previously provided.	The incompetent therapist must re attend the presentation along with the certified therapist, and should not practice JP until competence is proved.
6. The therapist will demonstrate JP principles to the client as a part of intervention.	The clients will be provided with educational booklets with pictorial instructions, and video tapes demonstrating JP during the session. The intervention will be carried over in two parts. Part 1: includes information about RA, principles of JP, energy conservation, and home work tasks. Part 2: includes discussion of the homework tasks, finding solutions, repetition of techniques	The clients should be able to demonstrate the learnt principles with a minimum of 80% of accuracy, to the therapist. The outpatient therapist will conduct 4 sessions of 2 hours per session.	The therapist must document the therapy and materials provided to the client.	If the clients are unable to perform principles accurately, sessions could be extended or the number of sessions can be increased and principles must be demonstrated again by the therapist.
7. The effectiveness of JP will be assessed by the therapist.	The therapist will use VAS to evaluate hand pain, and JPBA to measure adherence with joint protection. Grip strength will be evaluated using the Jamar dynamometer. Range of motion will be evaluated using the JAM scale, at the baseline and it will be followed up at the end of 6months and 12months.	Based on the evidence article, at the end of 12months, 60% clients will show improvement by following the JP education program, Pain will significantly decrease. Adherence to JP and use of JP principles will increase significantly ( $p \leq 0.01$ ). The ranges at the wrist and MCP will approximately increase by 5degrees.	The therapist will document the changes and improvement at the end of 6months, and 12months. The OT manager will keep a record of improvement, and conduct a survey to measure the success of JP, on a yearly basis.	If the patients do not improve in the main outcome measures at the end of 12months, the evaluating therapist will be assessed for his competency, the clients will also be tested to see if they were using the principles accurately. If the patients fail to follow up at the end of 6months or 12months, their appointment will be rescheduled.

Table Continued

Recommendation	Implementation plan	Criteria	Audit method	Compliance plan
8. The client's level of satisfaction will be assessed.	The clients will be interviewed after their intervention or a questionnaire will be provided to describe their experience with JP education program.	At the end of 12months, the clients will be questioned about their experience with JP and also tested based on the outcome measures.	The clients will be asked to maintain a diary and write down principles and experiences with JP.	The diary will be reviewed by the therapist, experience of the patient will be documented and a record will be maintained by the OT manager in the patient's files.

OT, occupational therapy; JP, joint protection; VAS, visual analogue scale; JPBA, joint protection behavior assessment; JAM, joint alignment motion scale; MCP, metacarpophalangeal joints; RA, rheumatoid arthritis