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Interventions to improve adherence to exercise for chronic musculoskeletal pain in adults

Background

This article is facilitated by the Australian Cochrane Musculoskeletal Group (CMSG) editorial base. The CMSG is one of the largest Cochrane review groups and produces reliable, up-to-date systematic reviews of interventions for the prevention, treatment or rehabilitation of musculoskeletal disorders.

Objective

Our aim is to place the findings of recent Cochrane musculoskeletal reviews in a context immediately relevant to general practitioners (GPs) by summarising the findings of a review of interventions to improve adherence to exercise for adults with chronic musculoskeletal pain (CMP).

Discussion

The findings indicate that there are various strategies that may be effective in increasing adherence to exercise and physical activity in patients suffering from CMP. These strategies are discussed in detail and general practice scenarios are presented to show how the results can be applied in practice.

Keywords

musculoskeletal pain; exercise; patient compliance

The Cochrane Collaboration is an international not-for-profit organisation with the aim of promoting evidence-informed health decision-making by producing high-quality, relevant, accessible, systematic reviews and other synthesised research evidence.¹ The Cochrane Musculoskeletal Group (CMSG) is one of the largest Cochrane review groups and has over 700 active researchers, healthcare professionals and consumer representatives from 26 countries.² The CMSG produces reliable, up-to-date systematic reviews of interventions for the prevention, treatment or rehabilitation of musculoskeletal disorders.

In 2005, an Australian satellite editorial office of the CMSG was established in Melbourne. An important aim of the Australian CMSG is to disseminate the results of Cochrane musculoskeletal reviews to clinicians in Australia. One way of doing this is through articles placing the findings of reviews in a context immediately relevant to GPs. Each article presents review results for a relevant topic and uses common general practice scenarios to show how the results can be applied in practice.

Chronic musculoskeletal pain (CMP) is a major health problem and affects approximately 30% of the general population.³ Data from a World Health Organization (WHO) survey⁴ suggest that pain is the most common reason for which patients seek medical care. Chronic pain can be defined as 'pain persisting beyond the expected time frame for healing or that occurs in disease processes in which healing may never occur'.⁵

The most common types of CMP include back pain and knee pain.^{6,7} Exercise and physical activity are beneficial for back and knee pain and are recommended by clinical guidelines.⁸⁻¹¹ However, poor adherence to exercise and physical activity has been shown to compromise their effectiveness in usual care.^{12,13} Therefore, interventions that improve adherence to exercise and physical activity are extremely important for optimising the clinical benefits of these interventions for people with CMP. This paper summarises the findings from a systematic review by Jordan et al¹⁴ of randomised controlled trials (RCTs) or quasi-RCTs, which assessed the effectiveness of different interventions to improve adherence to exercise therapy in people with CMP. The review results are summarised in *Table 1*. The cases discussed below show how these results might affect practice.

Table 1. Key results from systematic review by Jordan et al¹⁴

Summary of review

- This review assessed the effectiveness of different interventions to improve adherence to exercise therapy in people with chronic musculoskeletal pain.
- 42 trials with 8243 participants, mainly with osteoarthritis and back pain, were included.
- Interventions to improve adherence varied widely between trials, which differed in the types of exercise therapy, methods of delivery, exercise adherence-enhancing strategies, self-management programs and cognitive and/or behavioural therapy.
- Seven trials were judged to be high quality, 29 moderate quality, six poor quality.
- Most studies were not blinded.
- Given the differing study populations, interventions and measured outcomes, meta-analysis could not be performed so results were presented narratively.
- Overall, 18 of the 42 trials reported that the studied intervention improved adherence to exercise or physical activity.

Types of exercise

- Moderate-level* evidence from 17 trials suggests exercise type (eg aerobic versus resistance exercise, water-based versus land-based exercise, back-specific stabilisation versus general exercise, high- versus low-intensity exercise) does not affect adherence. Fifteen of the 17 trials that evaluated different types of exercise were unable to detect between-group differences in adherence.¹⁵

Delivery of exercise

- Five of the six trials that studied different methods of delivering exercise reported between-group differences in exercise adherence:
 - Supervised exercise was found to be more effective than unsupervised/home exercise at increasing exercise adherence (moderate-level evidence, two studies).
 - Individual-supervised exercise and group-supervised exercise reported positive effects on adherence; however, if session times are inflexible for group-based sessions then individual-supervised sessions may be more effective (moderate-level evidence, one study).
 - Accuracy of exercise performance (ie the extent to which participants perform the exercises correctly) and adherence may be improved by refresher or follow-up sessions and supplementing face-to-face instruction with other material such as an audiotape or videotape of the exercises (low-level evidence, two studies).

Exercise combined with a specific adherence-enhancing component

- Three of the four trials that evaluated exercise combined with a specific adherence-enhancing component reported a positive effect on exercise adherence, providing moderate-level evidence that these may be effective.
- Adherence-enhancing strategies that may be effective include educational and behavioural techniques such as positive reinforcement including reward and punishment strategies, goal setting, feedback, development of problem-solving skills to overcome barriers to adherence, and self-monitoring through use of an exercise plan, exercise contract and/or exercise logbook.

Self-management programs (SMPs)

- Six of the eight trials that studied SMPs reported improved adherence and all were based on SMPs for arthritis, providing moderate-quality evidence that SMPs are effective for adherence. SMPs in this context refer to a package of interventions specifically targeted at patient education and behaviour modification.
- Content of individual SMPs varied but some aspects that may increase adherence include education about pathology, how to manage/cope with symptoms, dealing with depression, nutrition, weight management, joint protection, relaxation, advice on how to increase physical activity levels, accessing community resources and social networks, effective communication, appropriate use of medication, goal setting, reinforcement and feedback, group discussion and problem solving, a personal contract, and self-monitoring via a diary.

Interventions based on cognitive and/or behavioural principles

- Two of the seven trials reported that including interventions based on cognitive and/or behavioural principles may have a positive effect on adherence.
- Behavioural-graded activity (which uses behavioural principles including positive reinforcement and withdrawal of attention towards pain behaviour to increase time spent in activity) may be effective at improving adherence to a home exercise program (moderate-level evidence, one study).
- The addition of cognitive behavioural therapy (CBT) to exercise programs may be effective for people with whiplash-associated disorder; however, adding CBT-based approaches to exercise programs was not reported to be effective in improving exercise adherence for other chronic musculoskeletal conditions (moderate-level evidence, one study).

Clinical outcomes and adherence

- The association between clinical outcomes and exercise adherence was conflicting. Of the 18 trials that showed improved adherence to exercise, only eight showed significant improvements in at least one clinical outcome, such as pain and function. The clinical effects were small-to-moderate in these studies. This may be due to variation in clinical outcome measures used in each trial and the fact that some did not report the effect of the intervention on clinical outcomes.

*Evidence defined as high level when further research is unlikely to change confidence in the estimate of effect; moderate level when further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate; low level if further research is very likely to have important impact or change the estimate and very low if any estimate of effect is very uncertain¹⁵

Putting evidence into practice

Case 1

Mrs Jones is 68 years of age, overweight, has borderline elevation of blood sugar levels and osteoarthritis of the right knee. She presents with frequent knee pain. You have previously advised her about improving her physical activity levels to better manage her musculoskeletal problems as well as her general health; however, she has not heeded your advice to date.

What options do you have?

First, a thorough assessment of Mrs Jones' physical capabilities, and of the barriers to and preferences for participation in physical activity is needed. From the perspective of adherence, there is no need to worry too much about the type of activity you prescribe (eg aerobic versus resistance exercise or water-based versus land-based exercise, etc). Choose one that has been shown to be effective for knee pain and one that she prefers. You can ask her what activities she likes to do and focus your advice on helping her to increase her participation in those.

Incorporating specific, adherence-enhancing strategies may help to keep Mrs Jones on track. Mrs Jones needs to identify her barriers to exercise and develop problem-solving skills to overcome them. Encourage her to set goals and self-monitor her progress using an exercise plan, logbook or exercise contract. Remind Mrs Jones that it is important to have rewards when she meets her exercise goals and these can be predetermined when the exercise contract is developed.

Another option is to suggest an arthritis self-management program if there is one in your area. Such programs may help with exercise adherence, although the evidence for other clinically important benefits of currently available self-management programs in managing osteoarthritis is lacking.¹⁶

After a discussion with Mrs Jones, you find that she enjoys walking but feels it is too difficult to attend a gym program and she is a poor swimmer. You decide to begin by developing a gently graded walking program for her. You start with a low-level program while you are working

on her pain relief. This program consists of a gentle walk of one lap around her local park each day (about 1 km on flat, even-surfaced paths), a plan to increase distance and speed, and adding inclines over the coming weeks and, initially, 2-weekly review to encourage adherence and to monitor her pain levels.

On review at the end of 2 months, Mrs Jones' knee pain is under better control and she is walking about 1.5 km most days, still on the level and relatively slowly. She feels better in herself and is happy with the program to date. You encourage her to work on the intensity of her walking by increasing her speed and adding inclines. You are hoping she reaches a goal of 30 minutes of moderate-level activity five times per week.

Case 2

Mr Peters, aged 53 years, presents with chronic intermittent low back pain. He is currently managing the pain with non-steroidal anti-inflammatory drugs (NSAIDs); however, he complains that these are now not working as well as they were previously. In the past he has tried home-based exercises prescribed by a physiotherapist, but he has not done them for over 1 year. On specific enquiry, you find that he saw the physiotherapist only three times, each 1 month apart. He was given no written instructions or other reminders to take away to explain how to do the exercises. He became discouraged at home as 'I was never sure I was doing them right'. He is moderately active but you still think he would benefit from increasing his general exercise, as well as some specific exercises for his low back pain.

What do you do?

You suspect that lack of supervision, reinforcement and monitoring contributed to his poor adherence to home exercises. You suggest that he recommence a home exercise program that has more supervision, and continual refresher and follow-up sessions. You send Mr Peters back to a physiotherapist with a written referral. You also take the time to make a phone call to the physiotherapist to ensure she has a good understanding of Mr Peters' adherence issues, and to suggest she, initially at least,

provides detailed training, regular monitoring and instructions for his exercise program.

You arrange to see Mr Peters 1 week after his first physiotherapist appointment to check on progress. At this review, you are happy to find that Mr Peters is pleased with his new supervised program. The physiotherapist has provided him with a written schedule of his various exercises, including detailed instructions on how to do each one. She has told him that as he progresses to other exercises, she will lend him some DVDs to use at home to help him with his exercise technique. Initially, he is having weekly physiotherapy appointments but there is a plan to reduce these depending on his progress. Mr Peters has also been advised of supervised, group-based exercise sessions he can join to complement what he is doing at home. You are happy with this progress and therefore make a plan to see him in another month to assess how well this program is helping him manage his back problems.

Discussion

The review by Jordan et al¹⁴ indicates that various strategies may be effective in increasing adherence to exercise and physical activity in patients with CMP. However, there are some significant limitations to be aware of when interpreting the results from this review. There was large heterogeneity in the study population, exercise programs and adherence interventions measured among studies included in this review. Adherence was measured in numerous ways, including as a continuous outcome (eg number/hours/minutes of exercise sessions attended) and as a dichotomous/categorical outcome (eg proportion attended sessions). Therefore, it was difficult to compare the effect size between studies and pool data, or determine whether reported effects on adherence were clinically significant. Additionally, neither participants nor healthcare providers were blinded, rendering the results at high risk of bias. Most studies were short term only and mean follow-up was <9 months. Given these limitations, no definitive conclusions can be made about which strategies may be best for improving adherence.

Nonetheless, from the review there are some key points worth considering in practice. The type of exercise prescribed (eg aerobic versus resistance exercise) does not influence levels

of exercise adherence. Therefore, decisions about the type of exercise to prescribe when motivating a patient to initiate and maintain a new exercise program should be based on patient preference and the current evidence regarding their effectiveness in relation to the patient's complaint.¹⁷

The way in which exercise is delivered may have an effect on adherence. For example, supplementing home exercise with a supervised group exercise program may improve overall physical activity levels; however, attendance at group sessions may be limited if session times are inflexible. In such situations, individual, supervised exercise therapy is an option. Incorporating specific adherence-enhancing strategies within an exercise program and self-monitoring may have a positive impact on adherence. There is some evidence for self-management programs to increase adherence to exercise and physical activity in patients with CMP. Translating these results into clinical practice has the potential to improve patient outcomes in this difficult clinical area.

Key points

- The type of exercise prescribed (eg aerobic versus resistance exercise) does not influence levels of adherence. Therefore, decisions about the type of exercise to prescribe when motivating a patient to initiate and maintain a new exercise program should be based on patient preference and the current evidence regarding their effectiveness in relation to the patient's complaint.
- Interventions such as supervised or individualised exercise therapy may enhance adherence.
- Incorporating specific adherence-enhancing strategies within an exercise program, such as positive reinforcement, goal setting, feedback, development of problem solving skills to overcome barriers to adherence and self-monitoring through use of an exercise plan, contract and/or logbook may have a positive impact on adherence.

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