

## Can Physical Therapists Deliver a Pain Coping Skills Program? An Examination of Training Processes and Outcomes

Christina Bryant, Prudence Lewis, Kim L. Bennell, Yasmin Ahamed, Denae Crough, Gwendolen A. Jull, Justin Kenardy, Michael K. Nicholas, Francis J. Keefe

**Background.** Physical therapists are well established as providers of treatments for common, painful, and disabling conditions, such as knee osteoarthritis (OA). Thus, they are well placed to deliver treatments that integrate physical and psychosocial elements. Attention is usually given to outcomes of such programs, but few studies have examined the processes and outcomes of training physical therapists to deliver such treatments.

**Objective.** The aim of this study was to describe the processes in training physical therapists: (1) to deliver a standardized pain coping skills treatment and (2) to evaluate the effectiveness of that training.

**Design.** This study was an analysis of data relating to therapist performance in a randomized clinical trial.

**Methods.** Eleven physical therapists were trained to deliver a 10-session pain coping skills training program for people with knee OA as part of a randomized controlled trial (N=222). The initial training was provided in a workshop format and included extensive, ongoing supervision by a psychologist and rigorous use of well-defined performance criteria to assess competence. Adherence to the program, ratings of performance, and use of advanced skills were all measured against these criteria in a sample (n=74, 10%) of the audio recordings of the intervention sessions.

**Results.** Overall, the physical therapists achieved a very high standard of treatment delivery, with 96.6% adherence to the program and mean performance ratings all in the satisfactory range. These results were maintained throughout the intervention and across all sessions.

**Limitations.** Only 10% of the delivered sessions were analyzed, and the physical therapists who took part in the study were a self-selected group.

**Conclusions.** This study demonstrated that a systematic approach to training and accrediting physical therapists to deliver a standardized pain coping skills program can result in high and sustained levels of adherence to the program. Training fidelity was achieved in this group of motivated clinicians, but the supervision provided was time intensive. The data provide a promising indicator of greater potential for psychologically informed practice to be a feature of effective health care.

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Dualistic models that emphasize the separation of mind and body have held sway in the treatment of physical illnesses for many years, with a consequent clear divide between “physical” and “psychological” treatments.<sup>1,2</sup> More recently, there has been a shift to a “biopsychosocial” model of health that integrates physical, psychological, and social factors.<sup>3</sup> Wade argued that rehabilitation must take into account the emotional factors and external stressors that contribute to impairment in “physical” functioning and explicitly called for dualism to be abandoned.<sup>2</sup> Knee osteoarthritis (OA) is a common, painful, and disabling condition in the treatment of which physical therapists play an important role.<sup>4</sup> Typically, the treatments they provide include exercise training without formal attention to psychological processes. Yet, there is ample evidence that painful chronic conditions, such as knee OA, are best managed by approaches that integrate both physical and psychosocial perspectives.<sup>3,5</sup>

By virtue of their substantial involvement with patient care, physical therapists have the potential to play a key role in applying a biopsychosocial model of health care. A series of articles in a special issue of this journal in 2011 called attention to the importance of *psychologically informed practice*, a term proposed by Main and George<sup>5</sup> to describe a midpoint between traditional biomedical physical therapy practices and specialized mental health treatment. Nicholas et al<sup>6</sup> highlighted the evidence that identifying psychoso-

cial risk factors for poor outcomes in low back pain leads to better outcomes. In a similar vein, Foster and Delitto<sup>7</sup> suggested that physical therapists can and should integrate psychosocial factors and principles into their work with patients with low back pain in a graded way. They proposed that all physical therapists would use simple psychological strategies such as enhancing patients’ expectations of treatment, but some physical therapists could be trained to provide more specialized interventions, such as motivational interviewing.

This call for physical therapists to use psychological strategies gives rise to the question of how physical therapists can best be trained to integrate psychological strategies into their work. Overmeer and colleagues<sup>8</sup> found that patient outcomes were not improved after physical therapists attended an 8-day training course that aimed to help practitioners identify and address psychological factors, such as unhelpful beliefs about pain and activity avoidance. The course consisted of both theoretical and practical elements, such as role playing, but no subsequent supervision of clinical practice. The authors suggested that the content of the course may have been too general, with too little emphasis on treatment skills; there was also no course manual.

Main and George<sup>5</sup> suggested that appropriate training is a key building block for developing a workforce that is able to deliver psychologically informed practice. It is also important that such treatment achieves *treatment fidelity*, a term that refers to the consistent and reliable delivery of interventions.<sup>9</sup> The recommendations from the National Institutes of Health Behavior Change Consortium<sup>9</sup> also make it clear that a key element in treatment fidelity (sometimes referred to as “treatment

integrity”) is first achieving training fidelity: a specific intervention cannot be delivered until those delivering it have learned to do so in a standardized way. Bellg et al<sup>9</sup> described 4 goals that should underpin training in order to enhance treatment fidelity and suggested a range of strategies that can be implemented to meet those goals. These goals were: to standardize training, to ensure provider skill acquisition, to minimize drift in provider skills, and to accommodate provider differences.

Despite suggestions that adequate training of physical therapists is a key to the provision of psychologically informed practice,<sup>5</sup> few studies have provided a detailed description and analysis of such training. Moreover, the principles of promoting training fidelity as an essential step in ensuring treatment fidelity have been recognized in the psychological literature<sup>9</sup> but applied much less in the physical therapy arena.

Therefore, the aim of this study was to examine whether physical therapists can be trained to deliver a standardized pain coping skills training (PCST) program<sup>10</sup> based on cognitive behavioral principles, designed to help patients manage their knee OA. The use of a standardized treatment protocol in conjunction with structured training, accreditation, and ongoing supervision processes enables us to comprehensively examine skill acquisition and maintenance of a psychologically informed intervention. We describe the processes we used to ensure training fidelity and provide quantitative data on the outcomes of the training. A separate article has reported a qualitative exploration of the physical therapists’ perspectives on their experiences with the PCST program,<sup>11</sup> and the results of the randomized controlled trial (RCT) from which the sample in the current



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- **eTable:** Description and Definition of Advanced Therapeutic Skills

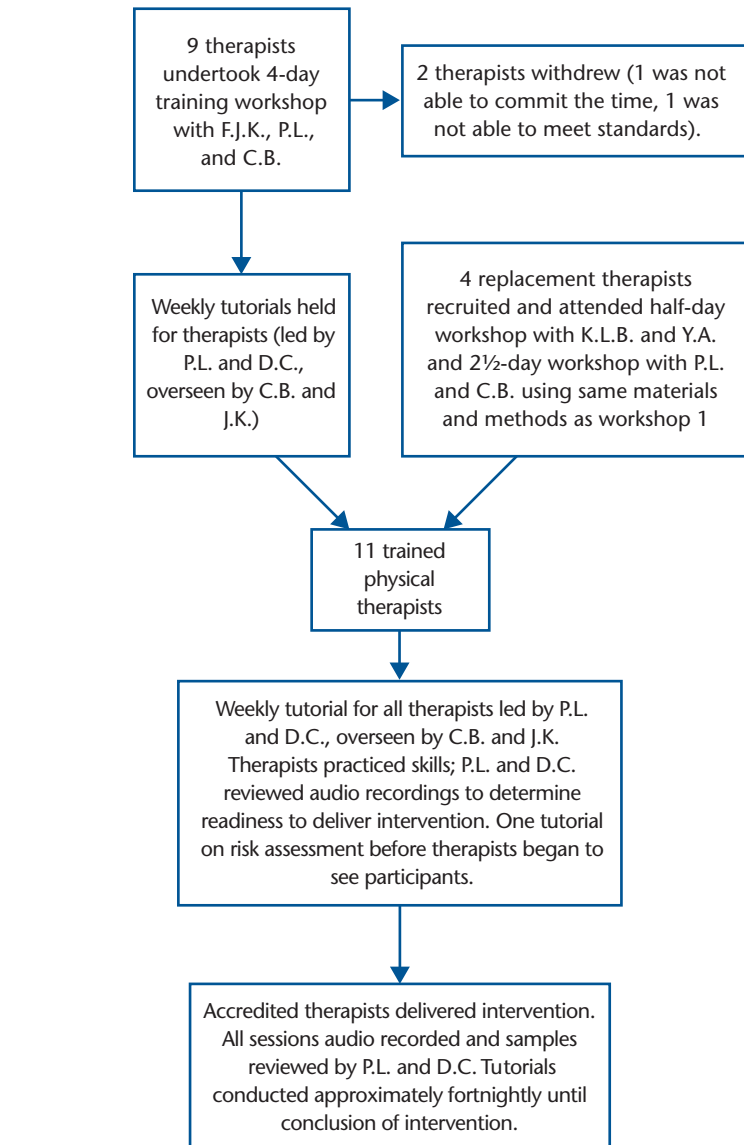
study was derived will be reported elsewhere.

## Method

### Study Design

The physical therapists were trained as part of a 3-arm RCT designed to investigate the effectiveness of a 10-session pain coping skills training intervention for people over the age of 50 years with knee OA recruited from the community.<sup>12</sup> In the RCT, participants with knee OA (N=222) were randomly allocated to 1 of 3 interventions, all delivered by physical therapists: strengthening exercise alone (n=75), PCST alone (n=74) and PCST with strengthening exercise (n=73). The study design, including details of participant recruitment and inclusion and exclusion criteria, has been reported in detail elsewhere.<sup>12</sup> The study was conducted at 2 sites, Melbourne and Brisbane, Australia, and the protocol conformed to Consolidated Standards of Reporting Trials (CONSORT) guidelines for reporting nonpharmacological interventions.<sup>13</sup>

Eleven experienced physical therapists, 6 in Melbourne and 5 in Brisbane, located at various metropolitan private practices, were trained to deliver the PCST intervention either on its own or combined with strengthening exercise. Although all therapists had more than 5 years of clinical experience in managing musculoskeletal pain disorders, only 2 had prior experience of the PCST intervention. Four clinical psychologists (2 at each of the Melbourne and Brisbane sites) were responsible for the ongoing PCST training and monitoring of the physical therapists following the formal intensive course. At each site, 1 senior psychology researcher (C.B. or J.K.) oversaw and supervised 1 site psychologist. Over the course of the study, the 2 site psychologists were responsible for the ongoing training and monitoring of the physical therapists' perfor-



**Figure 1.**

Flowchart demonstrating training and supervision procedures.

mance in delivering the treatment. Figure 1 shows the flow of recruitment and training of the therapists for the study.

### Pain Coping Skills Training Intervention

The PCST program was designed to teach people with chronic pain states to use behavioral and cognitive pain coping strategies to increase pain self-efficacy and the ability to carry out valued activities. The program, developed by Keefe

and colleagues,<sup>10</sup> is based on well-established cognitive-behavioral principles and has been extensively evaluated.<sup>10,14</sup> It involves 10 highly structured modules of 45 minutes' duration that were delivered over a 12-week period. Table 1 provides a summary and description of these sessions, which are all built around a structure that provides an educational rationale and then training in specific coping skills for managing pain. Topics include understanding pain, relaxation, pacing to achieve

## Pain Coping Skills Training

**Table 1.**  
Description of the Pain Coping Skills Training (PCST) Intervention

PCST Session	Content <sup>a</sup>	Description of Elements
<b>Session 1:</b> Introduction, overview of pain coping skills training, gate control theory, and rationale for pain coping skills, progressive muscle relaxation (PMR)	Introduction and overview of PCST — Goal setting — Introduce gate control theory of pain — Provide rationale for pain coping skills training — Train participants in PMR	Goal setting focuses on identifying valued activity and realistic goals. The gate control theory of pain is introduced in order to educate participants about the psychological factors that influence pain and to engage them in the self-management approach to living with chronic pain. It is related to the rationale for PCST, which emphasizes the role of thoughts, emotions, and behavior in reducing pain. PMR involves learning to tense and relax muscle groups in order to reduce tension and induce a feeling of relaxation.
<b>Session 2:</b> Mini-practices	— Train participants to perform mini-practices	A mini-practice is a brief relaxation technique involving slow breathing and muscle relaxation that can be used frequently throughout the day.
<b>Session 3:</b> Activity-rest cycling	— Train participants to apply activity-rest cycling to valued activities	Activity-rest cycling is a technique for pacing activity in order to encourage regular activity and avoid bursts of activity.
<b>Session 4:</b> Pleasant activity scheduling	— Assist participants to identify pleasant activities and to develop a plan	Pleasant activity scheduling encourages patients to identify enjoyable activities and to develop a realistic plan for engaging in these activities.
<b>Session 5:</b> Identifying negative thoughts, thought records	— Present cognitive model (ABC model) — Teach participants how to use thought records to monitor negative thoughts	The ABC model refers to identifying the links between events (A), thoughts (B), and feelings/actions (C) in order to learn more helpful ways of thinking.
<b>Session 6:</b> Challenging negative thoughts, calming self-statements	— Work with participants to challenge negative thoughts — Develop calming self-statements	Calming self-statements are thoughts that help an individual to cope with challenges.
<b>Session 7:</b> Problem solving, pleasant imagery	— Training in problem solving — Training in pleasant imagery	Problem solving is a structured 3-step technique for addressing a variety of problems: step 1=identify what is the problem, step 2=identify why this is a problem, and step 3=identify potential solutions and develop a specific plan of action. Pleasant imagery refers to using the imagination to generate a detailed pleasant scene to serve as a distraction from unpleasant thoughts or experience and as a means of relaxation.
<b>Session 8:</b> Distraction techniques, review of skills	— Training in counting backward — Training in use of focal points (visual/auditory) as distraction methods — Review skills from previous weeks	Distraction refers to diverting the attention away from an uncomfortable thought or sensation, such as pain, by focusing on an alternative, for example by counting backward. The participant's use of coping skills is discussed and skills needing revision are identified.
<b>Session 9:</b> Problem solving II: applying pain coping skills in problem situations	— Review problem solving model — Identify problem situations — Develop coping plans	Discussion and reflection on problem solving and generating coping plans for scenarios relevant to the participant, such as experiencing a pain increase or traveling. These might include scheduling the use of relaxation strategies or pacing.
<b>Session 10:</b> Coping skills maintenance: early warning signs/developing a coping plan	— Introduce principles of relapse prevention — Identify early warning signs of reduced coping — Develop plans to address lapses in coping	Educate participants about the likelihood of occasional minor setbacks in using coping skills (lapses). Help participants to identify early warning signs of lapses and develop plans in order to get back on track and avoid reverting to old ways of unhelpful coping (relapse).

<sup>a</sup> Sessions 2 to 10 included a session overview and review of home practice from previous sessions. Sessions 1 to 9 included home practice planning.

activity-rest cycling, pleasant activity scheduling, problem solving, goal setting, identifying and challenging negative thoughts, developing coping thoughts, pleasant imagery, and distraction. The emphasis is on assisting people to independently apply the coping skills to valued activities. They set goals for practice that are appropriate to the skill and keep a record of their home practice. For example, practicing progressive muscle relaxation twice per day and undertaking pleasant events 3 times per week is recommended. A manual was used to guide delivery of the program. The manual contained detailed information about each session, including the amount of time that should be allowed for each topic, rationale for the skill, and how to guide patients through skills practice. The manual also offers suggestions on how to deal with problems and issues that might arise during a session and suggests questions for eliciting information about homework activities and generating goals, together with handouts relating to each week's topic.

### Training Procedure

The training for physical therapists to provide the PCST intervention was delivered in a 4-day workshop, facilitated by the psychologist (F.J.K.) who developed the PCST program. The psychologists involved in the project also were present (C.B., J.K., P.L., and D.C.). This training procedure was similar to that used in other studies that have implemented the PCST program. For example, there was training of certified nursing assistants.<sup>14</sup> Prior to the workshop, the physical therapists were provided with a comprehensive training manual and were made aware of the time commitment involved. They also were made aware that they would be assessed for competence before being able to deliver the intervention. The workshop introduced the physical thera-

pists to key concepts in pain management and then systematically taught them how to deliver each of the 10 modules. This teaching involved initial didactic presentations, demonstrations of the skills by the facilitator and the site psychologists, and practice by the physical therapists. For example, when teaching the component of pacing, the facilitator first explained the rationale for this skill and then demonstrated how it would be explained to a person with knee OA by using 1 of the psychologists in a role play. Then the physical therapists worked in pairs to practice delivering this component of the program, receiving feedback from each other and from the workshop facilitators.

One physical therapist from each study site withdrew from the study prior to commencing with participants with knee OA. One withdrew due to the time demands of the accreditation and ongoing training program, and the other withdrew due to difficulties with delivering the protocol to an acceptable professional standard. Following this withdrawal, 2 additional physical therapists were recruited for each study site in order to provide a group for training purposes. These 4 therapists attended a half-day training session in Melbourne with the lead researcher (K.L.B.) and study coordinator (Y.A.). This training session was immediately followed by a 2½-day training program facilitated by the Melbourne study psychologist (C.B.) and site psychologist (P.L.). The same materials and methods used during the initial 4-day training program were able to be delivered in a shorter time because there were fewer participants. One of these physical therapists from Brisbane discontinued due to an unwillingness to follow the study protocol. This discontinuance was because this therapist was uncomfortable with the biopsychosocial approach and its

emphasis on self-management, preferring a more medical model that emphasized the role of physical pathology. An additional physical therapist, therefore, was recruited in Brisbane and trained by the Brisbane site psychologist using the same materials and methods described above. Thereafter, the procedures for accreditation and ongoing supervision were identical to those for therapists who underwent the earlier training process.

The workshop was followed up with weekly group tutorials with the site psychologists, the objective of which was to prepare the physical therapists for the accreditation process. This preparation was achieved by practicing the skills on a session-by-session basis through group discussion, role playing, and feedback from the psychologists. The tutorials were face to face, with some additional individual support via telephone when needed. The physical therapists also were required to attend a training session run by the site psychologist about identifying and responding to potentially suicidal participants prior to commencing sessions with participants.

Outside of the tutorials, and prior to delivering treatment with an actual patient, the physical therapists were required to practice the delivery of these skills with a person not associated with the study acting as a patient. When the physical therapists were confident that they had mastered the skills required for the first session, they made an audio recording of a first session using a digital recorder provided by the researchers. This audio recording was reviewed by the site psychologists against specified criteria for fidelity to the content and quality of its delivery (as indicated in the Appendix, using session 1 as an example). Extensive written feedback was provided directly to the

physical therapists between tutorial sessions, and aspects of the feedback thought to be relevant to the group as a whole were discussed at the tutorial sessions.

The physical therapists were accredited to deliver the treatment sessions once audio recording of each practice session had been reviewed by the site psychologist and found to meet the specified criteria. The criteria included objective assessment of whether each component of the treatment session had been covered and whether time guidelines had been adhered to, as well as more qualitative ratings of engagement with the participant (Appendix). In order to be accredited, the therapists had to have included all the treatment components for that session and had to have achieved a mean score of 3 (satisfactory) in the rating of performance. The physical therapists were able to take on participants for treatment in the trial after they had been accredited for the first 6 sessions while completing accreditation for the remaining sessions. Tutorial sessions continued to be held, generally fortnightly, after accreditation until the end of the intervention period. Thus, the physical therapists who attended the initial training attended tutorial sessions fortnightly for approximately 2 years.

All sessions conducted by the physical therapists with participants in the RCT were audio recorded. The sessions reviewed by the site psychologist were selected on the basis of physical therapist ability and complexity of the participant. Consistent with the suggestions of Waltz and colleagues,<sup>15</sup> priority was given during training to sessions conducted by the physical therapists with lower levels of ability in terms of protocol delivery. These physical therapists tended to be those with little or no prior knowledge and experience rel-

evant to the content of the protocol. Priority also was given to the sessions conducted by physical therapists with lower levels of interpersonal skills. High priority was given to listening to sessions involving patients who disclosed significant distress and to those experiencing possible mental health conditions.

### Evaluation of the Physical Therapists' Skills

In order to evaluate the quality of the PCST intervention delivered by the physical therapists, the site psychologist rated 10% of the sessions ( $n=74$ ) using randomly selected audio recordings from the 2 groups involving PCST. The Melbourne psychologist (P.L.) rated those from Brisbane (D.C.) and vice versa by listening to randomly selected audiotapes and rating them against standardized criteria developed by the last author (F.J.K.) and used in a previous study by Keefe et al.<sup>16</sup> Three measures of session quality were used. First, adherence to each specified element of the program was evaluated using a "yes/no" response format to indicate mean protocol adherence across all the sessions sampled. Adherence criteria for each of the 10 sessions were specified in the protocol (the number for each session ranging from 5 to 8)—for example, whether the physical therapist carried out a review of homework practice after the session outline had been given, as specified for session 2. Second, physical therapist competence (ie, the quality of performance) was assessed across all the sessions sampled for each of the following behaviors: establishes and maintains rapport, remains on schedule with the protocol or makes appropriate adjustments when indicated, applies PCST protocol to participant's situation and current challenges, encourages participant's active involvement in the session, uses time effectively with appropriate pacing, demonstrates good interpersonal skills,

demonstrates professionalism and clinical judgment, and overall effectiveness and skill of the physical therapist. Competence was evaluated on a scale of 1 to 5 (1=poor, 2=fair, 3=satisfactory, 4=very good, and 5=excellent). Third, sessions were evaluated for demonstrated use of higher-level therapeutic skills. Once again, therapist competence was evaluated on a 1 to 5 scale (1=poor, 2=fair, 3=satisfactory, 4=very good, and 5=excellent). These skills are listed and described in the eTable (available at [ptjournal.apta.org](http://ptjournal.apta.org)).

In order to examine longitudinal change in skills, we examined mean adherence, performance, and advanced skill use against time since treating the first participant. We used these indicators as a measure of experience in delivering the protocol.

### Data Analysis

Data were managed in Microsoft Excel (Microsoft Corp, Redmond, Washington). In order to evaluate adherence to the protocol, an adherence percentage was calculated by dividing the number of criteria met for each session by the total number of criteria for that session. Means and medians of the performance ratings were calculated to give an indication of the quality of therapist performance in their use of the basic and advanced therapeutic skills.

## Results

### Adherence to the Protocol

The overall adherence to the protocol was 96.6% ( $SD=3.6$ , range=87.2-100) (Brisbane 98.7%, Melbourne 94.6%), indicating that the physical therapists in this study carried out the intervention as it was intended. There were no observed differences between the therapists who had undertaken the 4-day training and those who had undertaken

the second training with a duration of 3 days.

### Physical Therapist Performance Ratings

Table 2 shows the mean and median scores achieved by the physical therapists after the completion of their training and during the actual conduct of the trial. All scores were above the midpoint, indicating that the specific skills required to implement to program had been acquired. The lowest median scores were for managing time (3.2) and remaining on schedule (3.4), which highlights the challenges of adhering to a strict protocol. The highest median scores were for demonstrating good interpersonal skills, encouraging patients' active involvement in sessions, and demonstrating professionalism (all 3.9).

Table 3 presents the mean and median scores achieved by the physical therapists in relation to advanced therapeutic skills. These scores were also all above the midpoint, indicating that the therapists were using high-level skills in their work with their patients. The lowest score was obtained for "roll with resistance," a complex skill that requires the therapist to both express empathy and encourage the client to remain engaged. Figure 2 shows the means for all the therapists with respect to adherence and performance, as well as advanced skill ratings, for each session. As shown in the figure, adherence ranged from 92% to 100%, with the lowest rating being for session 6, which is the session that deals with the skill of challenging thoughts. Basic and advanced skill ratings also were consistently in the range of 3 to 4, out of a possible score of 5, over all sessions.

Figure 3 shows the average scores for adherence and performance expressed at time points relative to

**Table 2.**  
Scores Obtained by Physical Therapists for Required Therapeutic Skills<sup>a</sup>

	$\bar{X}$ (SD)	Median
Establishes/maintains rapport	3.9 (0.5)	3.8
Remains on schedule with the protocol or makes appropriate adjustments when indicated	3.4 (0.4)	3.4
Applies program protocol to participant's situation and current challenges	3.6 (0.6)	3.5
Encourages participant's active involvement in the session	3.9 (0.5)	3.9
Uses time effectively/appropriate pacing	3.2 (0.4)	3.2
Demonstrates good interpersonal skills	4.0 (0.5)	3.9
Demonstrates professionalism and clinical judgment	3.9 (0.4)	3.9
Overall effectiveness/skill of the therapist	3.5 (0.3)	3.5
All skills	3.7 (0.4)	3.6
Range of means	3.2–4.0 (0.3)	

<sup>a</sup>1=poor, 2=fair, 3=satisfactory, 4=very good, 5=excellent.

the number of months since treating the first study patient. This figure shows that adherence to the protocol remained in the range from 95% to 100% throughout the trial, except for a small drop to 90% for sessions conducted 2 months after the start of the intervention. Similarly, the ratings of the therapists' performance on both basic and advanced therapeutic skills were stable across the length of the intervention and showed no decline or evidence of skill decay.

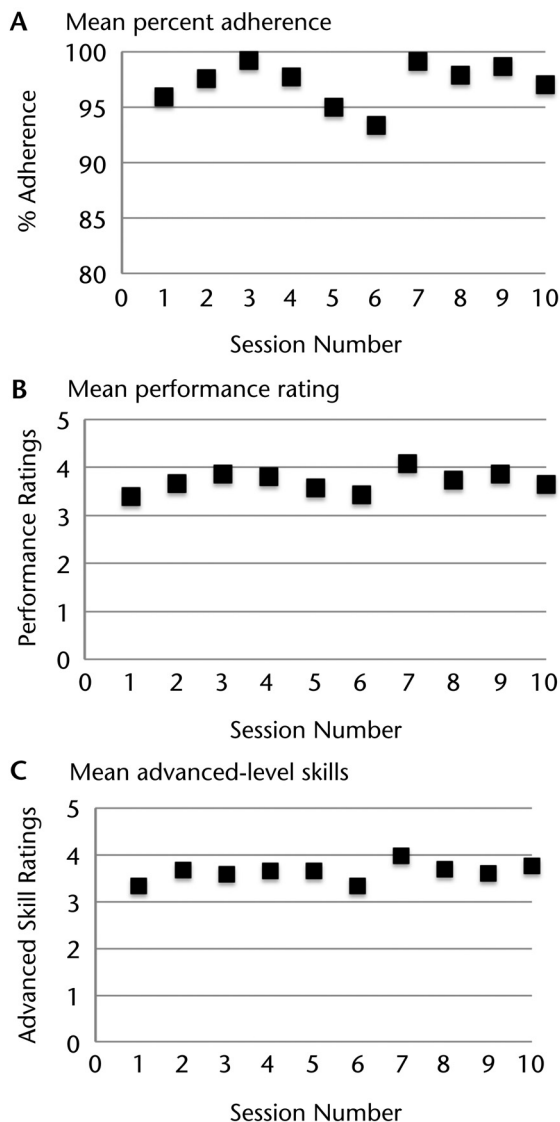
### Discussion

The aim of this study was to describe and evaluate the process involved in training a group of physical therapists to deliver an evidence-based, pain coping skills program based on cognitive-behavioral principles. Eleven physical therapists were trained as part of an RCT designed to investigate the effectiveness of a 10-session pain coping skills training intervention for people over the age of 50 years with knee OA. Training took place through several modali-

**Table 3.**  
Scores Obtained by Physical Therapists for Advanced Therapeutic Skills<sup>a</sup>

Inspire rating	$\bar{X}$ (SD)	Median
Open-ended	3.7 (0.7)	4
Affirming	3.7 (0.7)	4
Reflecting	3.6 (0.7)	4
Ongoing summary	3.0 (0.7)	3
Elicits talk	3.7 (0.7)	4
Supportive/accepting	3.9 (0.7)	4
Encourages change	3.6 (0.6)	4
Roll resistance	3.2 (0.6)	3
Self-efficacy	3.7 (0.6)	4
Total	3.6 (0.5)	3.5

<sup>a</sup>1=poor, 2=fair, 3=satisfactory, 4=very good, 5=excellent.



**Figure 2.** Means for all physical therapists (N=11) for each of the 10 sessions. The hashed line represents the mean across the sessions.

ties, including a training workshop, small-group tutorials and ongoing supervision sessions, and written individualized feedback. Our results indicate that the physical therapists achieved a very high level of adherence to the protocol for the intervention and a more than satisfactory level of skill with respect to specific therapeutic behaviors, as demonstrated by average scores across all skills of 3.7 (maximum=5). These skill levels were consistent across all sessions, with the exception of ses-

sion 6. Session 6 was concerned with teaching the patients to recognize and challenge unhelpful thinking and replace it with calming statements that help them to deal with challenges. This is a complex skill that requires considerable practice. Finally, the data show that these skills were maintained throughout the length of the intervention. Importantly, there was no evidence that skill levels declined or that the therapists became less careful in

their adherence to the protocol as the trial progressed.

These results are similar to those achieved by the direct care staff trained by Teri and colleagues<sup>17</sup> and the psychologists trained by Keefe and colleagues in their study of PCST for knee OA.<sup>18</sup> These results contrast, however, with those of the study by Overmeer et al,<sup>8</sup> where the training component was longer, not linked to a formal protocol, and without ongoing supervision of clinical practice. This finding highlights the crucial importance of the sustained use of criterion-based supervision to maintain skills that have been learned, a point that was emphasized in comments made by participants in the qualitative study related to this intervention.<sup>11</sup> Further evidence for the importance of the supervision component comes, indirectly, from the equivalent skill levels of the physical therapists who had undertaken the 4-day training and those who had undertaken the 3-day training. Direct evidence of the importance of this component comes from the longitudinal data that provide clear evidence of skill maintenance and consistent adherence to the protocol throughout the length of the intervention.

We found that scores on adherence and therapeutic skills (Fig. 2) showed little change from the time when the therapists first commenced sessions with patients until the end of the intervention period, with neither significant decline nor improvement in these scores. One explanation for this finding could be that this consistency reflects skill levels that the therapists possessed even before training; this explanation, however, is unlikely because 9 of the 11 therapists were new to PCST training. It is more likely that the consistency achieved reflects the quality of the training and ongoing supervision they received. These



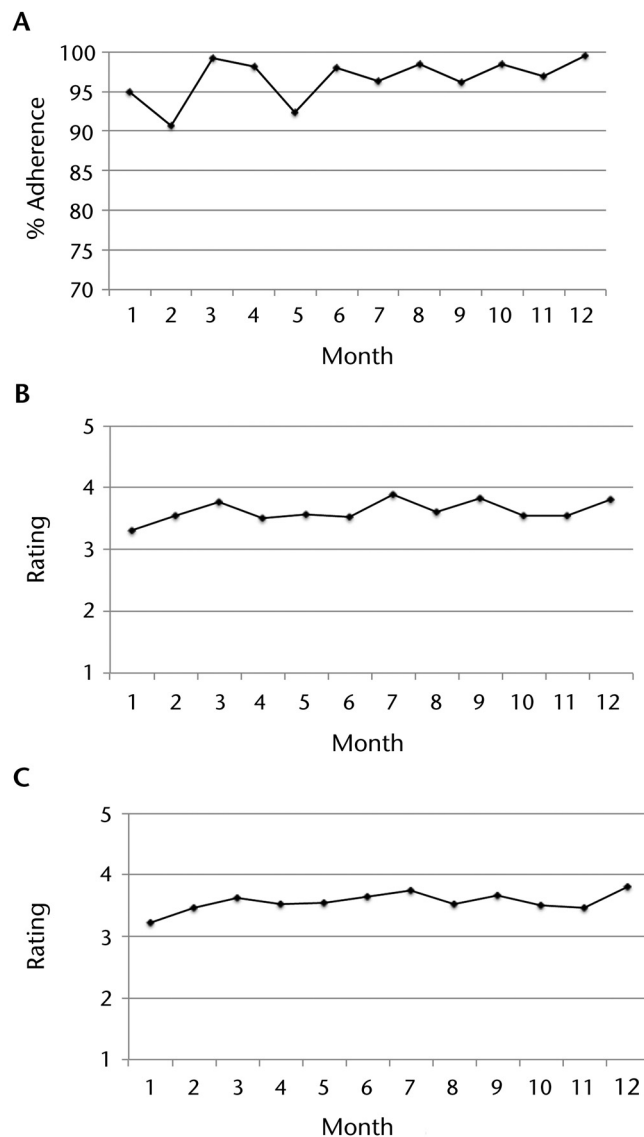
outcomes provide evidence that treatment fidelity was indeed achieved and underscore the quality of the intervention that was delivered. Physical therapists are not trained counselors, however, and arguably could not be expected to develop the highest levels of competence with respect to these skills. These reasons may be why these skills appear to plateau and why the hardest sessions to deliver were those involving skills most closely related to cognitive therapy.

A number of factors are likely to have contributed to the good outcome of the training in our study. In summary, we used a formal treatment protocol, standardized training procedures with criteria that were specified, and ensured that skill acquisition was achieved by accrediting the physical therapists on the basis of performance that was reviewed against specified criteria. We also provided long-term support, supervision, and review of the physical therapists, even after accreditation, to ensure that skill levels were maintained throughout the intervention period. These factors have all been identified as crucial to achieving training fidelity.<sup>9,15,16</sup>

Bell et al<sup>9</sup> have suggested a range of strategies that represent best practice in training people to deliver effective behavior change interventions. The strategies for standardizing training include: ensuring that providers meet a priori performance criteria, having providers train together, having training take into account different experience levels, using standardized training manuals and materials and structured practice and role plays, and observing implementation with pilot participants. The strategies for ensuring skill acquisition include: scoring therapist adherence according to an a priori checklist, providing written examinations, certifying interven-

### Figure 3.

(A) Average percent adherence by physical therapists to pain coping skills program protocol expressed as time points relative to the number of months since treating the first participant in the study. (B) Average total performance ratings of physical therapists expressed at time points relative to the number of months since treating the first participant in the study. (C) Average total advanced skill ratings of physical therapists expressed at time points relative to the number of months since treating the first participant in the study. 1=poor, 2=fair, 3=satisfactory, 4=very good, 5=excellent.



tion providers before the intervention, and providing multiple training sessions. In order to reduce drift away from skills that have been learned, Bell et al suggest strategies such as conducting weekly supervision sessions, allowing therapists access to project staff to answer questions, and having professional leaders

supervise lay group leaders. Our protocols embodied almost all of the recommendations, with some exceptions: We did not conduct any written examinations, as we deemed practical skill level to be a better indicator of learning in this instance, nor did we have professional leaders supervising lay therapists, as this rec-

ommendation was not applicable to our therapists.

Although we were able to demonstrate a high level of skill acquisition in the physical therapists involved in this trial, this was a time-intensive procedure. Including the initial workshop and subsequent tutorial and individual feedback sessions, and practicing skills prior to accreditation, we estimate that the physical therapists devoted around 150 hours to their preparation to deliver the intervention and ongoing review of their skills. The site psychologists spent approximately 1,500 hours reviewing the audio recordings, preparing written feedback for running the tutorials, and receiving supervision from the senior psychologists approximately monthly. Future research should evaluate whether the training process can be shortened in order to make this intervention less intensive to implement.

Given the prescriptive nature of the protocol and the intensive accreditation process, it is perhaps not surprising that 3 potential physical therapists were not eventually accredited. One therapist took part in the initial training but discontinued because of the time demands of the accreditation process. Another physical therapist was asked to withdraw from the study because that therapist was unable to follow the protocol and deliver the sessions as specified in the manual. The third dropout was as a result of that physical therapist not being able to embrace the self-management principles of the program; the therapist believed in a more biomedical approach to treatment. The reasons for not completing accreditation highlight 3 important considerations for training and treatment fidelity. The time demands are considerable, and not all physical therapists will be able to commit to the program described here. Furthermore, it does

not suit all therapists to embrace a biopsychosocial approach. These 2 factors indicate that therapists should be carefully selected for suitability to undertake this type of training. More importantly, treatment fidelity is most likely to be achieved if the physical therapists who do not have the required level of competence do not deliver the intervention.<sup>15</sup> Through the use of specified criteria and competence assessments, we were able to exclude therapists who would have compromised treatment fidelity.

Our results should be interpreted in the light of several limitations. First, only 10% of the delivered sessions were analyzed, raising the possibility that they may not have been representative of all the sessions. However, there is no reason to suppose that they would have been systematically different from the remaining sessions, and 74 can be considered an adequate sample. Second, although we were able to demonstrate that physical therapists can be trained to deliver a psychologically informed intervention to a high level of competence, we are not yet able to report any data on the efficacy of that intervention because this analysis is still in progress. Third, the physical therapists involved in this study were a self-selected group who chose to commit to a rigorous training, accreditation, and supervision process; we therefore cannot infer from the current study that this training can be generalized across all settings and to all physical therapists. Indeed, Hyer et al<sup>14</sup> found that the certified nursing assistants who were trained in their study were reluctant to practice the skills learned and did not participate in the intervention as actively or consistently as hoped at the outset of the study. In contrast, the physical therapists who completed the accreditation process and were then involved in our study adhered strongly to the protocol and

showed strong commitment to it throughout the intervention period. However, we cannot draw any conclusions about the maintenance of the skills learned within the training beyond the study protocol. This would be the subject of further study.

Nevertheless, the study has significant strengths, in particular the use of well-established treatment, training, review, and supervision processes that were acceptable to a group of 11 physical therapists. In addition, we were able to quantify adherence to the protocol and longitudinally evaluate the physical therapists on a range of therapeutic skills.

This study adds to a small body of literature examining the potential for physical therapists to practice in a way that integrates both physical and psychological elements. It demonstrates that physical therapists can learn to implement a pain coping skills program following a set protocol when adequately trained and supported and that these skills can be maintained. It also highlights the importance of paying attention to training fidelity as one aspect of treatment fidelity, something that is sometimes overlooked in reports of interventions.<sup>15,19</sup> Given the high level of involvement that physical therapists have in the care of people with conditions such as OA, our data provide a promising indicator of greater potential for psychologically informed practice to be a feature of effective health care.

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Bennell and Jull oversaw the recruitment of participants. Ms Ahamed, Dr Crough, and Professors Bennell, Jull, Kenardy, Nicholas, and Keefe provided consultation (including review of manuscript before submission).

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## Pain Coping Skills Training

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### Appendix.

Evaluation Criteria for Physical Therapist's Pain Coping Skills Training (PCST) Session

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#### Session 1

Patient ID: \_\_\_\_\_

Date of Session: \_\_\_\_\_

Therapist: \_\_\_\_\_

Rater: \_\_\_\_\_

**General Ratings of Therapist Adherence: Indicate below whether the item occurred ( ✓ ), did not occur ( 0 ), or cannot say ( ? )\* due to tape quality or other factors.**

- \_\_\_\_\_ Introductions
- \_\_\_\_\_ Discusses goals and focus of study
- \_\_\_\_\_ Presents gate control theory and rationale for coping skills training
- \_\_\_\_\_ Describes progressive muscle relaxation (PMR) and its benefits
- \_\_\_\_\_ Gives brief PMR demonstration
- \_\_\_\_\_ Guides participant through progressive muscle relaxation exercise
- \_\_\_\_\_ Post PMR review
- \_\_\_\_\_ Assigns home practice for coming week

**General Ratings of Therapist Performance: Rate each therapist's behavior on a 1–5 scale as follows:**

1=Poor | 2=Fair | 3=Satisfactory | 4=Very Good | 5=Excellent | (or ?=Cannot Rate)\*

- \_\_\_\_\_ Establishes/maintains rapport
- \_\_\_\_\_ Stays on schedule with the protocol or makes appropriate adjustments when indicated
- \_\_\_\_\_ Applies PCST protocol to participant's situation and current challenges (if applicable)
- \_\_\_\_\_ Encourages participant's active involvement in the session
- \_\_\_\_\_ Uses time effectively/appropriate pacing
- \_\_\_\_\_ Demonstrates good interpersonal skills (warmth, concern, confidence, genuineness)
- \_\_\_\_\_ Demonstrates professionalism and clinical judgment (eg, boundaries, role)
- \_\_\_\_\_ Overall effectiveness/skill of the therapist in this session

**General Rating of Patient Difficulty: Rate using 0–5 scale as follows:**

0=None | 1=Very Low | 2=Low | 3=Moderate | 4=High | 5=Very High

- \_\_\_\_\_ Level of interference today due to participant issues

Notes: \* \_\_\_\_\_

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