

Effects of therapeutic alliance on clinical outcomes in patients with symptomatic knee osteoarthritis undergoing an exercise program: A randomized clinical trial protocol

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Appendix 1

A1. Therapeutic script

The physical therapist must consider verbal and non-verbal aspects to foster the enhanced therapeutic alliance, which are detailed below. Components such as empathy, active listening, and a positive attitude and presence during the entire exercise protocol will be the basis of this therapeutic script.

Verbal content during the sessions:

- Session 1: The bond is established. Prescription of the exercise.
- Session 2: Explanation of the mechanisms of action of the exercise.
- Session 3: Reinforcement of the prescription and the mechanisms of action of the exercise.

Non-verbal language: The dialogue that the physical therapy must follow will be accompanied by a non-verbal language that facilitates the creation of an environment of trust, closeness and concern.

Table 1. Keys of non-verbal language for an enhanced therapeutic alliance.

Keys	Applicability
^a Eye contact	Frequent during interaction
^b Postural changes	Lean forward, symmetrical postures, and open hand/arms
^c Nodding	Cervical flexion-extension movement when listening
^d Gestures	Smiling

Therapeutic script: enhanced therapeutic alliance – day 1

Opening

- Good morning/good afternoon, Mr./Mrs. XXX, my name is XXX, I will be the physical therapist helping you during these three sessions.
- I am interested in how I can help you and for this I need to ask you some questions. To begin, I would like to know how are you doing today? What activities are more difficult for you due to the osteoarthritis in your knee? What reduces or makes your discomfort disappear?
- What are your expectations from these three exercise sessions?
- Perfect, we must both do our best in these three sessions to take advantage of this space.

Executing the therapeutic exercise

- Mr./Mrs. XXX, before starting, I need to mention that the exercises that we have included in the protocol are those that have been scientifically proven to be effective in reducing pain and improving the functional capacity of the knee in people with osteoarthritis. However, I should also mention that there is a percentage of people who do not respond to exercise therapy.
- We will do 4 different types of exercises and I will always be guiding you and accompanying you. We will also personalize the number of repetitions of each exercise according to your abilities to ensure it is safe for you.

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- The first exercise consists of cycling for 20 minutes at a moderate intensity, and we will control your heart rate with a device called a heart rate monitor. We will adjust the bicycle seat to your height and maintain a pedaling that keeps a heart rate between XXX and XXX beats per minute.
- Mr./Mrs. XXX, now we will do some mobility exercises, you will have to imitate my moves.
- To finish preparing your body to do the strength exercises, we will place a light weight on your ankle while seated and you will have to keep your knee straight for as long as possible, with a maximum of 5 minutes.
- We will do four strength exercises and they seek to improve the ability of your muscles to move in a better way. We will calculate how many repetitions you can do in each of the exercises and repeat three sets of each of them. To personalize the exercises, we will use a 0-10 effort perception scale, which tells us that “0” corresponds to no effort and “10” to maximum effort, in which case you would be unable to perform one more repetition. The key to personalizing the number of repetitions that you should and can perform is that, as you go through the exercise, you indicate when you perceive you have reached an effort of 6/10. This is the moderate intensity of exercise that has been shown to be safe for people with knee osteoarthritis.

Closing

- Excellent, Mr./Mrs. XXX, what do you think of the session?
- You have done a great job Mr./Mrs. XXX, for this reason, it is normal if you feel a little muscular pain due to the exercise. In any case, anything that happens until the next session, you can let me know. Do you have any questions?
- I hope we keep on improving in the next session. Have a nice day, Mr./Mrs. XXX.

Therapeutic script: enhanced therapeutic alliance – day 2

Opening

- Good morning/good afternoon, Mr./Mrs. XXX, nice to see you again, how are you doing today?
- Tell me, how have you been feeling after our last session?
- Perfect, today we should keep on working together to achieve better results. For this, we will replicate the training from the last session. Shall we begin?

Executing the therapeutic exercise

- Mr./Mrs. XXX, we will begin with 20 minutes of cycling, just like the last session. Remember we must keep a heart rate between XXX and XXX. The cycling exercise at a moderate intensity, like the one we are doing today, has proven to be effective in reducing knee pain. This is because repetitive movement stimulates the release of our body’s own painkillers that are found in our nervous system and that they closely resemble morphine. Different types of aerobic exercise, such as walking, jogging, swimming or elliptical training at the intensity we are working on today, can cause these effects.
- Now we will do a couple of mobility exercises, Mr./Mrs. XXX. You will have to imitate my movements as in the previous session. These movements allow our brain and body in general to prepare to be more efficient during exercise.
- Next, Mr./Mrs. XXX, we will do the exercise of keeping the knee extended for as long as possible. This exercise serves to stimulate ease the pain in the same way as the exercise we did on the bicycle.

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- Alright, Mr./Mrs. XXX, we will do the strength exercises. We will do the same exercises that we did the last session, however, we will recalculate the repetitions, since research indicates that our physical capacities vary from day to day. Remember we must reach an effort of 6/10 as we do the repetitions.
- Mr./Mrs. XXX, do you know why these strength exercises can be useful to you? It has been seen that many people with knee osteoarthritis have less force in certain muscle groups, and the interesting thing is that, when these muscles are strengthened, the symptoms decrease significantly, as well as it has also been observed that movement and the ability to perform activities with the knee improve in most cases. Besides, when strength increases, the perception of knee stability improves considerably, reducing fear and increasing the patient's confidence to move, which is precisely what the patient stops doing due to osteoarthritis. Regarding the latter, the most modern research indicates that exercise, contrary to what was thought, helps the cartilage of your knee by slowing the progress of the disease, even causing the total disappearance of symptoms in some cases. Mr./Mrs. XXX, what we have done these two sessions is to train the muscles that I mentioned, each of the exercises is designed for that.

Closing

- Excellent job today, Mr./Mrs. XXX. How did you feel? Today we went through all the exercises again in an incredibly good way and we talked about interesting things as well. That is what this is about, sharing information that can be useful while we improve your body. Just like the previous session, any detail of how you feel, we can discuss it in the next session. Have a nice day, Mr./Mrs. XXX, see you.

Therapeutic script: enhanced therapeutic alliance – day 3

Opening

- Good morning (good afternoon), how are you, Mr. (Mrs.) XXX?
- Regarding the last session and the treatment in general, how have you been feeling?
- That is good, Mr./Mrs. XXX, then let's get started. Today we have a lot of exercises to do and we need to make the most of it. Shall we begin?

Executing the therapeutic exercise

- Mr./Mrs. XXX, do you remember what was the first exercise? Yes, perfect, 20 minutes of cycling exercise, trying to keep a heart rate between XXX and XXX. Can you recall what was this exercise useful for?
- The second part consisted of mobility exercises. Can you show me the exercises we have been doing? I can help you remember if necessary.
- Mr./Mrs. XXX, we did an exercise of keeping your knee straight with a light weight on your ankle, do you remember what this was for? Shall we do it?
- Good, now we only have left the strength exercises. Mr./Mrs. XXX, can you calculate the repetitions that you need to do today of each set? I will help you if necessary. Excellent, remember that we need to reach an effort of 6/10 for each exercise.
- Mr./ Mrs. XXX, if you had to advice another person that has knee osteoarthritis, how would you explain that these exercises will help?

Closing

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- You have done a great job, Mr./Mrs. XXX. What do you think of the session you conducted today? What stands out the most about these exercise sessions that we have done? It has been a pleasure to meet you, Mr./Mrs. XXX, have a good day.

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Limited therapeutic alliance script

The physical therapist must consider verbal and non-verbal aspects. However, the objective of this script is to transmit a neutral message efficiently to apply the exercise protocol accordingly. Components such as empathy, active listening, a positive attitude and presence during the entire exercise protocol will not be part of this therapeutic script.

Verbal content during the sessions:

- Session 1: The bond is established. Prescription of the exercise.
- Session 2: Explanation of the mechanisms of action of the exercise.
- Session 3: Reinforcement of the prescription and the mechanisms of action of the exercise.

Non-verbal language: The dialogue that the kinesiologist must follow will be accompanied by a neutral non-verbal language.

Table 2. Keys of non-verbal language for a limited therapeutic alliance.

Keys	Applicability
^a Eye contact	Scarce during the interaction. Focus on writing a file
^b Postural changes	Lean back, asymmetrical postures, and hand/arms crossing (hands in pocket)
^c Nodding	Not done
^d Gestures	Not contextualized facial expression or scarce interaction

Therapeutic script: limited therapeutic alliance – day 1

Opening

- Good morning (good afternoon), my name is XXX, I will be the physical therapist applying the exercise protocol during these three sessions.
- How have you been feeling today? What activities are more difficult for you due to the osteoarthritis in your knee? What activities make your knee problem worse? What reduces or makes your discomfort disappear?
- Perfect, let's begin with the exercises.

Executing the therapeutic exercise

- Before starting, I need to mention that the exercises that we have included in the protocol are those that have been scientifically proven to be effective in reducing pain and improving the functional capacity of the knee in people with osteoarthritis. However, I should also mention that there is a percentage of people who do not respond to exercise therapy.
- You will do 4 different types of exercises. Besides, I will personalize the number of repetitions of each exercise to your abilities to ensure it is safe for you.
- The first exercise consists of cycling for 20 minutes at a moderate intensity, and you will use a heart rate monitor to control your heart rate. The bicycle seat will be adjusted to your height and you will need to maintain a pedaling that keeps a heart rate between XXX and XXX beats per minute.

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- Now you will do some mobility exercises. I will teach you the moves. The objective of this is to prepare you for the strength exercises.
- To finish preparing your body to do the strength exercises, I will place a light weight on your ankle while seated. You will have to keep your knee straight for as long as possible, with a maximum of 5 minutes.
- You will do four strength exercises and they seek to improve the ability of your muscles to move in a better way. To personalize the exercises, we will use a 0-10 effort perception scale, which tells us that “0” corresponds to no effort and “10” to maximum effort, in which case you would be unable to perform one more repetition. The key to personalizing the number of repetitions that you should perform is that, as you go through the exercise, you indicate when you perceive you have reached an effort of 6/10. This is a moderate intensity of exercise that has been shown to be safe for people with knee osteoarthritis.

Closing

- Good, you have done a great job, and for this reason, it is normal if you feel a little muscular pain due to the exercise. In any case, anything that happens, you can let me know in the next session.
- Have a good day.

Therapeutic script: limited therapeutic alliance – day 2

Opening

- Good morning (good afternoon), how are you?
- Perfect, today you will continue with the exercise protocol. For this, we will replicate the training of the last session. Let's start.

Executing the therapeutic exercise

- You will begin with 20 minutes of cycling, just like the last session. Remember you must keep a heart rate between XXX and XXX. The cycling exercise at a moderate intensity, like the one we are doing today, has proven to be effective in reducing knee pain. This is because repetitive movement stimulates the release of our body's own painkillers that are found in our nervous system and that they closely resemble morphine. Different types of aerobic exercise, such as walking, jogging, swimming or elliptical training at the intensity we are working on today, can cause these effects.
- Now you will do a couple of mobility exercises. These movements allow our brain and body in general to prepare to be more efficient during exercise.
- Alright, now you will do the same strength exercises that we did the last session, however, we will recalculate the repetitions, since research indicates that our physical capacities vary from day to day. Remember we must reach an effort of 6/10 as we do the repetitions.
- Why these strength exercises can be useful for people with osteoarthritis? It has been seen that many people with knee osteoarthritis have less force in certain muscle groups, and the interesting thing is that, when these muscles are strengthened, the symptoms decrease significantly, as well as it has also been observed that movement and the ability to perform activities with the knee improve in most cases. Besides, when strength increases, the perception of knee stability improves considerably, reducing fear and increasing the patient's confidence to move, which is precisely what the patient stops doing due to osteoarthritis. Regarding the latter, the most modern research indicates that exercise, contrary to what was thought, helps the cartilage of your knee

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by slowing the progress of the disease, even causing the total disappearance of symptoms in some cases. What we have done these two sessions is to train the muscles that I mentioned, each of the exercises is designed for that.

Closing

- How did you feel today? Today you went through all the exercises again in a good way, just like the last session. Any detail of how you feel, you can let me know. See you in the next session.

Therapeutic script: limited therapeutic alliance – day 3

Opening

- Good morning (good afternoon), how are you, Mr. (Mrs.) XXX?
- Regarding the last session and the treatment in general, how have you been feeling?
- We have some exercises to do today, so let's begin.

Executing the therapeutic exercise

- Do you remember what was the first exercise? Yes, 20 minutes of cycling exercise Try to keep a heart rate between XXX and XXX. Can you recall what was this exercise useful for?
- The second part consisted of mobility exercises. Show me the exercises you did the last session.
- We also did an exercise of keeping your knee straight with a light weight on your ankle, do you remember what this was for? Please repeat it.
- Now we only have left the strength exercises. Can you calculate the repetitions that you need to do today of each set? Remember that you need to reach an effort of 6/10 for each exercise.
- If you had to advice another person that has knee osteoarthritis, how would you explain that these exercises will help?

Closing

- What do you think of the session you conducted today?
- Have a good day.