

Development of an exercise manual and guidelines for patients with plantar fasciitis

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ABSTRACT

Plantar fasciitis is a common cause of heel and foot pain. It affects approximately 2 million Americans annually. Physiotherapy is the first treatment prescribed, and its success depends on the patient's adherence to treatment. **Objective:** This study aimed to develop a manual with orientations and exercises for patients with plantar fasciitis and to assess its clarity, level of understanding, and satisfaction among patients and physiotherapists. **Method:** Thirty physiotherapists and thirty patients, who were literate and showed no cognitive deficit, participated in this study. They analyzed a manual that consists of 10 exercises and orientations for patients with plantar fasciitis. **Results:** All exercises and orientations were well understood (above 90%). The manual was considered excellent by the patients and great by physiotherapists. **Conclusion:** Demonstrating a relevant level of understanding and satisfaction among therapists and patients, the manual proved to be a supplementary tool in the treatment of patients with plantar fasciitis.

Keywords: Fasciitis, Plantar, Exercise Therapy, Physical Therapy Modalities, Practice Guideline

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INTRODUCTION

Plantar fasciitis or heel pain syndrome is a frequent cause of pain located in the calcaneal region or along the entire plantar fascia to its insertion, especially on the first steps of the day and after long periods without supporting the feet on the ground, and most times it leads to an important functional loss.^{1,2}

This affliction is suffered by approximately 2 million Americans a year and it is estimated that about 10% of the world population has already presented or will present some complaint of foot pain at some time in their lives.³⁻⁵ Until now, there have been no conclusive data on the incidence of this pathology in Brazil, due to the scarcity of epidemiological studies on the subject. Taunton et al.⁶ conducted a retrospective case-control study that analyzed 2,002 runners with acquired injuries and reported that plantar fasciitis was the most common affliction to their feet, representing 8% of all the injuries.

Its etiology is the involvement of intrinsic and extrinsic factors that can evolve to an acute inflammatory process and, consequently, to the degeneration of the plantar fascia.^{3,4} The related intrinsic factors are obesity, overload on the plantar fascia, reduction of dorsiflexion in the ankle joint^{4,5} and in the hallux due to shortening of the triceps surae,⁵⁻⁷ repetitive microtraumas, anatomical and biomechanical alterations of the plantar arch such as the type and size of the arch, discrepancy between limbs, alterations of the static and dynamic positioning of the foot, and, among extrinsic factors, the use of inappropriate shoes is highlighted.⁷⁻⁹

Plantar fasciitis is considered a self-limiting disease and it is usually treated in a conservative manner. The treatment can vary between 6-18 months and demands that the patient do exercises at home and follow the orientations of the physiotherapist relative to the exercises and to the use of appropriate shoes, among other things.¹⁰⁻¹⁴

The conservative treatment has a fundamental role in the rehabilitation of the patient with plantar fasciitis, for it contributes to correct functional alterations. There are many modalities of conservative treatments; however, until now there is no consensus in the literature on which modality of treatment is the most appropriate for these patients.¹⁵⁻¹⁸

As for the preparation of orientation manuals, they have been written to help patients during the entire period of rehabilitation and

afterwards, seeking to provide reeducation and support in the performance of the exercises done by the patient at home.

Considering that the manuals are written based only on the experience of the care given and not on evidence on the subject, they generate questions in patients about their specific problems. Therefore, it is necessary to have better evidence as a basis to prepare a manual, whose information provides efficacious results and, at the same time, transmits the objectives of the rehabilitation process clearly.¹⁹

Considering that plantar fasciitis is a disease that afflicts millions of people all over the world and that its clinical presentation generally causes limitation in the functional activities of an individual, a manual of exercises and orientations was prepared to help the patient during and after the treatment period so as to improve the quality of life of these patients, reducing the rehabilitation period and the cost to the health systems.

OBJECTIVE

The objectives of the present study were to analyze the level of understanding and satisfaction of the lay public and physiotherapists with a manual with orientations and therapeutic exercises for patients with plantar fasciitis.

METHOD

The present transversal study was approved by the Research Ethics Committee of the *Universidade Federal de São Paulo* in accordance with resolution CEP006828/2012 and was developed in the Physiotherapy department of the AACD - *Lar Escola São Francisco*. In this study 30 physiotherapists were included who were specialized in orthopedics and 30 patients of both genders, aged between 18 and 65 years, diagnosed with plantar fasciitis who received physiotherapy at the institution. Patients who were illiterate or who had some visual, auditory, or cognitive deficit were excluded from the study.

A manual with 10 exercises and orientations to patients with plantar fasciitis was prepared based on recent clinical evidence with good methodological quality.

All the individuals who agreed to participate in the study signed the free and informed consent form, where all the information relevant to the procedures performed in this study was contained.

After its preparation, the manual went to the pre-test phase, where it was analyzed by two physiotherapists, accompanied by those responsible for the project, in order to evaluate the level of understanding of the exercises and the difficulties found and the suggestions proposed by them. After the initial suggestions were given and adaptations were made, the manual was considered ready to be applied to the remaining participants. A minimum of 80% of understanding for each exercise/orientation was adopted. The exercises/orientations that did not reach that target were reviewed and reformulated in accordance with the suggestions proposed.

After the first phase (test), the adaptations necessary were made (all referring to the writing so as to make it less formal and more understandable to the patients) and the manual was applied to the remaining physiotherapists and patients selected for the study.

Each patient had only one examiner reading the instructions on how to use the manual and the participant, after reading the exercises contained in the manual, answered whether he or she had understood it or not. The patients were instructed to read and perform each exercise contained in the manual (following the recommendations contained in the manual relative to the number of series and repetitions) so that the examiner could verify whether the patient really understood how to perform the exercises of the manual. Each patient was evaluated in an isolated room, without the presence of the other participants, to avoid tendentious results.

The manual was given to the physiotherapists and each item was answered, with a space for suggestions. In addition, at the end of the questionnaire, the physiotherapists rated the degree of satisfaction with the manual in the following manner:

0 - terrible/1 - regular/2 - satisfactory/3 - good/4 - great/5 - excellent;

After analyzing the data, the exercises that did not reach the minimum of 80% understanding were either reformulated or excluded from the manual.

The data from this study were tabulated in Microsoft Office Excel® 2010 to characterize the sample in relation to age, gender, and schooling. The understanding of the items by the patients and by the professionals and the level of satisfaction with the manual were observed through a descriptive analysis of the data. A minimum of 80% of understanding necessary for each exercise/orientation was adopted.

RESULTS

The manual was developed to evaluate the level of understanding and satisfaction of the physiotherapists and patients/lay people; it contained information referring to plantar fasciitis and was composed of 10-muscle stretching and strengthening exercises, in addition to giving cautions to be taken during the rehabilitation process.

The demographic data of the participants of the study are shown in Table 1.

As for the field of work of the physiotherapists in the study, 100% (30) worked with orthopedics and their time since graduation varied from 12 months to nine years, with 50% (15) of the physiotherapists having graduated 12 months before.

In relation to the schooling of the lay participants, 15 (50%) had finished high school, five (16%) had finished college, and the remaining 11 (36%) had not finished high school. There was no sampling loss.

All the exercises obtained a level of understanding within the standards attributed to each one of them, as shown in Table 2.

All the exercises analyzed by the lay participants also obtained a satisfactory level of understanding within the standards attributed to them, as shown in Table 3.

At the end of the manual, each participant of the study could write a note about his or her understanding and level of satisfaction. The manual had a good level of approval,

since more than 60.3% of the physiotherapist classified it as excellent or great and 83.3% of the lay participants evaluated the manual as excellent or great (Figure 1).

From the analysis made in all the manuals applied to the participants of the study, it was observed that all the suggestions proposed by each individual certainly coincided with those of the remaining participants, that is, they showed the same focus of suggestion.

Among the suggestions proposed, those pertinent to the objectives proposed in the exercises and observed in almost all the manuals were about the reformulation of some technical terms used in the description of the exercises and the number of series and repetitions that were not described in the manual. It was also suggested that arrows be put in some drawings to facilitate the understanding of the movement being made. The most pertinent suggestions were incorporated into the manual.

DISCUSSION

Plantar fasciitis is a pathology that afflicts two million Americans per year and represents approximately 10% of all the foot pathologies, which makes physiotherapists face these patients frequently. In the literature, there is a lack of consensus on which modalities of physiotherapeutic treatment are more efficacious in the treatment of this pathology.

Thinking of that, a manual of exercises and orientations was prepared for plantar fasciitis patients so that they could have, in addition to the outpatient treatment, an illustrated guide that could be a supplement to the treatment being made, so as to minimize the symptoms of this pathology during and after the rehabilitation period.

According to Panobianco et al.¹⁹ the studies that used this approach presented an important point in the area of health, because they facilitate the communication between health professionals and patients through didactic materials in addition to reinforcing the verbal information offered. Also, a program of physiotherapeutic exercises done at home favors the minimization of public expenditure on health, making the patient understand that the activities proposed can facilitate function, optimize abilities, and maintain muscle flexibility.²⁰

Fransen & Mc Connel,²¹ in a systematic review that addressed exercise therapy for patients with knee osteoarthritis, points out the good results in relation to pain and function in patients who practiced exercises at home as a supplement to the supervised therapy that is done in clinics and offices, emphasizing the importance of the patient's adherence to the treatment, through the practice of exercises at home.

The manual developed was evaluated by two different groups composed of physiotherapists working in different areas and of lay participants with different levels of schooling, to analyze the level of understanding and satisfaction about the orientations and exercises proposed in the manual.

As for the choice of the public participating in the study, lay participants were chosen to include individuals with different levels of schooling and social class, who could evaluate the manual and expose their level of understanding and satisfaction so that the manual could be used by a diversified public and not be restricted only to a specific group of patients.

The level of schooling of the individuals can interfere directly with the understanding of the manual and in the absorption and reproduction of the information contained in it, which could directly influence the results.

As for the level of understanding of the manual, it was observed that each exercise proposed obtained a minimum percentage of 93.33% understanding in the physiotherapist group as well as in the lay participants, which corroborates the objectives proposed in the study.

Table 1. Characterization of the sample according to gender and age

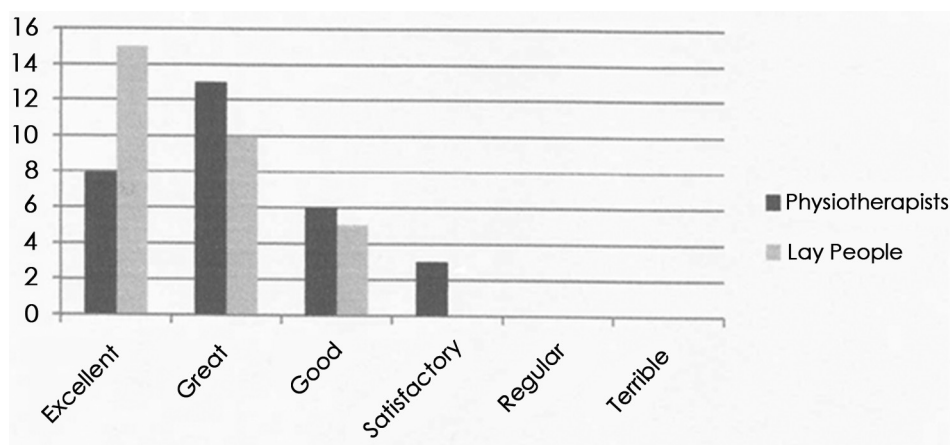
	Physiotherapists (n = 30)	Lay people (n = 30)
Age	21-32 average: 25.9 years	18-65 average: 39.3 years
Females	26 (87%)	17 (57%)
Males	4 (13%)	13 (43%)

Table 2. Understanding of the manual by the physiotherapists

	Muscle Stretching Exercises	
	Understood	Not understood
Exercise 1.1 (Fascia stretching)	28 (93.33%)	2 (6.66%)
Exercise 1.2 (Fascia stretching)	29 (96.66%)	1 (3.33%)
Exercise 2.1 (Calf stretching on a step)	28 (93.33%)	2 (6.66%)
Exercise 2.2 (Calf stretching on the wall)	29 (96.66%)	1 (3.33%)
Exercise 2.3 (Calf stretching with band)	30 (100%)	0
Exercise 2.4 (Calf stretching on a ramp)	30 (100%)	0
	Muscle Strengthening Exercises	
	Understood	Not understood
Exercise 3.1 (Strengthening with a towel/cloth)	30 (100%)	0
Exercise 3.2 (Strengthening with a pencil)	29 (96.66%)	1 (3.33%)
Exercise 3.3 (Strengthening with marbles)	30 (100%)	0

Table 3. Understanding of the manual by the patients

Muscle Stretching Exercises		
	Understood	Not understood
Exercise 1.1 (Fascia stretching)	30 (100%)	0
Exercise 1.2 (Fascia stretching)	30 (100%)	0
Exercise 2.1 (Calf stretching on a step)	29 (96.66%)	1 (3.33%)
Exercise 2.2 (Calf stretching on the wall)	30 (100%)	0
Exercise 2.3 (Calf stretching with band)	29 (96.66%)	1 (3.33%)
Exercise 2.4.2.4 (Calf stretching on a ramp)	30 (100%)	0
Muscle Strengthening Exercises		
	Understood	Not understood
Exercise 3.1 (Strengthening with a towel/cloth)	30 (100%)	0
Exercise 3.2 (Strengthening with a pencil)	28 (93.33%)	2 (6.66%)
Exercise 3.3 (Strengthening with marbles)	30 (100%)	0

**Figure 1.** Level of approval for the manual

The final evaluation of the manual showed that between the physiotherapists who participated in the study, most of them (43%) evaluated the manual as a great tool to help in the treatment of plantar fasciitis, while 50% of the lay participants evaluated the manual as excellent.

The physiotherapists who participated in the study also gave some suggestions on the exercises and orientations proposed in the manual. Some of the suggestions proposed initially were a better description of the positioning during all the exercises proposed, the number of series and repetitions suggested for the exercises, the naming of certain parts of the body, as well as the amount of information offered to show the exercise, and the demonstration of the exercises through the images, emphasizing the correct positioning

for the exercise. These suggestions were well accepted and incorporated into the manual.

If any exercise did not reach 80% understanding, it would be reformulated or removed from the manual, which did not occur, since the minimum level of understanding obtained was 93.33%.

Despite the various studies and diverse methods of treatment, there is still a scarcity of studies with methodological rigor to determine the most efficacious physiotherapeutic treatment for patients with plantar fasciitis, which was the main difficulty found in the preparation of the present study.

It is necessary to develop more studies that confirm the effects of the techniques used in the treatment of plantar fasciitis. We suggest the application of this manual to plantar fasciitis patients to verify its effectiveness.

CONCLUSION

From this study, it can be concluded that the manual prepared showed a relevant level of understanding and satisfaction among the physiotherapists and lay participants/patients and can thus be used as a supplementary resource in the treatment of plantar fasciitis.

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