SUPPLEMENTARY MATERIAL 2

Description of the web application

The exercise application is a web-based video library hosted on a server connected to the Internet. There are two versions of the web application. The first version (hosted in http://rhbhombro.com/profesional) is aimed at health professionals, and it allows for personalization of the specific exercises to include in each program for a particular patient. The second version (hosted in http://rhbhombro.com/) is a reduced version that contains predefined exercise programs for the treatment of rotator cuff tendinopathy, supraspinatus tears, massive rotator cuff tears, and frozen shoulder. For this randomized controlled trial, six predefined programs for rotator cuff tendinopathy, contained in the second reduced version of the web application, will be used. All the videos and the information contained in the application are on Spanish language.

Software development

The web application has been developed with PHP 7.2.2 programming language (http://php.net/releases/7_2_2.php) and a MVC (Model - View - Controller) infrastructure Laravel Framework 5.6.3 (http://laravel.com). Furthermore, it integrates the API of the professional streaming platform Vimeo (http://vimeo.com) that allows the distribution of videos to professionals and patients for different devices. The application is hosted on a VPS with Debian 8 (Jessie) (64 bits) with Apache 2.4.10 and MySql 14.14 database engine.

Selection of the exercises and design of the videos

First, a search was conducted in Medline/Pubmed, Cochrane, PEDRO, and AMED databases regarding published randomized controlled trials evaluating exercise programs for the management of each one of the four abovementioned disorders. The trials with the lowest risk of bias, and the greatest content reporting of the exercise programs were selected.

Second, a multidisciplinary consensus meeting was conducted to reach consensus, based on the published literature, on the specific exercises to include for the treatment of each pathology, as well as the prescription parameters. For this purpose, the following points were considered: 1) proven effectiveness and detailed description in low risk-of-bias randomized controlled trials; 2) recommendations for exercise prescription parameters of The American College of Sports Medicine; and 3) adaptation of the abovementioned

literature to the patients' profile seen at the hospital in which the web application was meant to be implemented.

Finally, the group of healthcare professionals collaborated with a team of graphic designers to create the animated videos of the selected exercises.

Web application features

Prescribe an exercise program, choosing from a series of previously designed exercises, depending on the pathology and clinical characteristics of the patient.

The healthcare professional can select the specific exercise to prescribe to a given patient using the first abovementioned version of the web application, or the select one of the predefined programs within the second version of the application, that can also be tailored to patients' clinical characteristics (Figure 1).

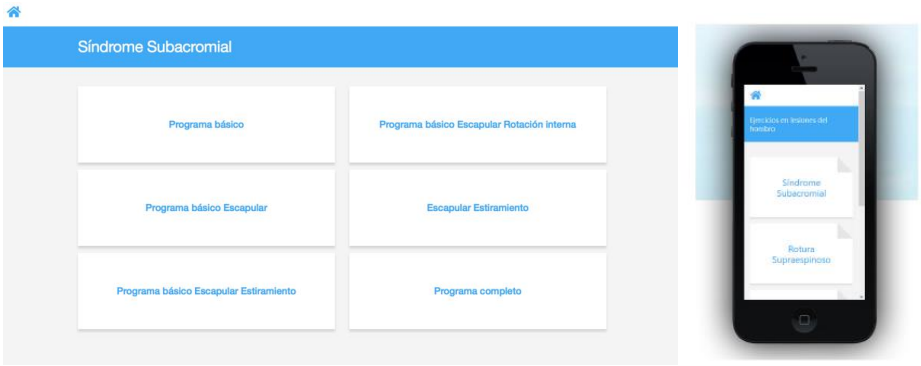

Figure 1. Screenshot of the web application. Left = laptop/tablet; right = smartphone.

For this randomized controlled trial, six predefined programs within the rotator cuff tendinopathy section of the second version of the web application will be used, namely: basic program, basic program plus scapular exercises, basic program plus scapular exercises and stretching, basic program plus scapular exercises and internal rotation, scapular exercise and stretching program, and full exercise program. Detailed description of the exercises are programs is presented in Supplementary Material 4.

View the videos included in the exercise program from different electronic devices (computer, tablet, or smartphone) without the need to install any specific software.

Each of the animated videos is composed of an animated person who performs the intended exercise, allowing the watcher to see the performance from different angles and planes. Furthermore, the video displays an audio-recorded explanation of the exercise performance, along with subtitles (Figure 2).

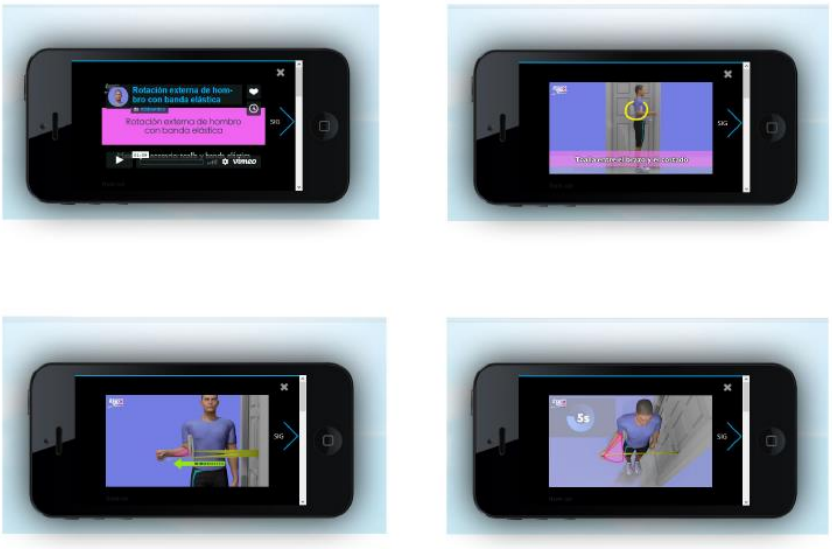

Figure 2. Example of an animated video from a smartphone device.

It allows the program chosen by the professional to be sent to the patient by means of a link generated.

The specific exercise program prescribed can be facilitated to the patient by means of a link generated, so the patient has only access to the prescribed exercises by the healthcare provider.