

Review Article

A Systematic Review Of App-Based Rehabilitation For Back Pain.

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Abstract

Clinicians and patients alike routinely use smartphones and the apps that go along with them. Even though the technology is widely available, rehabilitation has not yet embraced its application. Given the challenges patients currently face in obtaining healthcare, the SARS CoV-2 pandemic has created an opportunity to accelerate their integration. This study's objective was to conduct a thorough literature evaluation on the application of smartphone rehabilitation apps in relation to traditional physiotherapy for back pain. In accordance with PRISMA recommendations, we searched the Medline/Pubmed and Google databases using the search phrases [APP] AND [[Orthopaedic] OR [Neurosurgery]]. In every study, the VAS-pain score was shown with no significant difference between the interventional and control groups ($p = 0.277$ after intervention and $p = 0.399$ before). Only one study group discovered a noticeably greater improvement in PROMs for the application group; the other groups' findings were comparable to those of the control group. For patients with back discomfort, application-based rehabilitation programs offer a convenient substitute or alternative to conventional physiotherapy. Given how common cellphones are in our daily lives, if patients are self-committed and cooperative, this will further improve recovery.

Keywords : back, spine, applications, pain, and rehabilitation.

INTRODUCTION

Both patients with chronic back pain and those in the post-operative phase following spine surgery frequently experience rehabilitation [1]. These rehabilitation services have often been provided by means of in-person patient consultations. The digitalization of healthcare delivery has rapidly increased since the emergence of SARS-CoV2 [2]. The benefits of remote rehabilitation programs conducted via smartphone devices have been brought to light by the pandemic.

In July 2022, there were more than 6 billion smartphone owners globally [3]. More over one-third of Americans' media consumption in 2021 took place on mobile devices, with smartphones accounting for 72.3% of that usage [4]. The widespread usage of smartphones and related applications offers a chance to incorporate them into clinical procedures and lessen the obstacles that patients have while trying to obtain medical care.

Apps are being utilized more and more in the healthcare industry to collect patient outcome data, streamline communication, and occasionally measure outcome data.

81% of patients (who had never had surgery before) who participated in a poll of 146 patients in a neurosurgical waiting room said they would be interested in utilizing a postoperative communication and monitoring app [5]. There is evidence to support telerehabilitation in general orthopaedics [7], but it is avoided when discussing app-based rehabilitation specifically for back pain and after spine surgery. The purpose of this systematic review is to compile the body of research and data documenting the results of app-based rehabilitation programs for back pain and after spine surgery.

MATERIALS AND TECHNIQUES

On July 30, 2022, a systematic review was conducted. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards were followed for searching the Pubmed/MEDLINE, Cochrane, and Google Scholar databases. [8]. The largest search phrases were believed to be [APP] AND[[Orthopaedic]OR[Neurosurgery]]. All papers analyzing the results of smartphone app-based rehabilitation for back pain patients and those recovering from spine surgery

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that reported their findings in English, German, or French were included. Letters to the editors, comments, and non-accessible full articles were disqualified, as were those that did not demonstrate a functional outcome after rehabilitation. Our goal, using the PICO approach, was to compare the control group to the interventional group (O,C) in patients with low back pain (P,I). We therefore anticipated that app-based rehabilitation is just as effective as traditional physiotherapy (C,O).

Both the risk of bias and the quality of publications were evaluated (Table 1). Population demographic information was gathered, including age, gender, back pain duration, body mass index (BMI), indication, follow-up, patient-reported outcome measures (PROM), and apps used. The visual analogue scale of pain (VAS), SF-36, Likert score, PHQ-9, Korff, and current symptoms score (CSS) were employed as functional outcomes. Additionally, by contrasting the control group with the intervention group, the significances found in the various research were highlighted.

FINDINGS

Of the 7636 individuals examined in the nine prospective investigations, 466 were placed in the control group. There were 7055 patients in the interventional group after Irvine AB et al. included an alternate group ($n = 199$). The average age was 44.2 ± 7.4 years, and 466 of the 7636 patients who were examined in the nine prospective investigations were placed in the control group. There were 7055 patients in the interventional group when Irvine AB et al. added an additional group ($n = 199$). The majority of patients were female (75.3%, $n = 5638/7487$), with a mean age of 44.2 ± 7.4 years. The mean, when BMI was taken into account, was 26.3 ± 2.2 kg/m², and the reported duration of pain was 19.6 ± 11.6 months. Table 2 presents all of the results. Back and neck discomfort [10], non-specific back pain [11], and chronic lower back pain were the topics of some authors' reports. There were issues with the aetiology of the aforementioned pain because none of the research had precise definitions. posing queries on the cause of the previously described ache.

Among the smartphone apps were FitBack [16], Snapcare [14], Fitbit [15], and Kaya [12,13]. The app utilized was not identified in the other investigations. The duration of follow-up ranged from four weeks [11] to six months [15]. In addition, the follow-up presentation varied throughout smartphone apps such as FitBack [16], Snapcare [14], Kaya [12,13], and Fitbit [15].

CONVERSATION

According to this comprehensive study, patients who have had back pain for an average of 19.6 ± 11.6 months do not

significantly differ between application-based rehabilitation and regular physiotherapy (control group). Despite the rehabilitation technique, the majority of trials showed a significant improvement in pain. A true meta-analysis could not be carried out because of the heterogeneity of the data.

Diabetes [19], weight loss [20], mental health [21], speech difficulties [22], and cardiovascular illnesses [23] are among the current applications in healthcare that require evaluation based on the quality of the content and comparison of the interventions with best practice recommendations. One of the main obstacles to effective app-based therapy is adherence to a postoperative rehabilitation program [24]. Up to 30% of students miss class, and compliance is usually low [25, 26]. To get a positive result, program participation must be consistent. An efficient method for reducing pain in self-motivated patients with high compliance is app-based rehabilitation. Instead than showing patients various exercises, a sensor might be utilized to provide real-time feedback, such as a measurement of the muscular strength used.

Various apps were employed in the studies under investigation. According to the authors, the Kaya App uses thorough evidence-based multidisciplinary pain therapy in accordance with international disease management recommendations. In 2016, Machado et al. conducted a search and discovered 61 apps in total. Most included a mix of yoga, biomechanical exercises, and stretching and strengthening.

A mix of biomechanical exercises, such as strengthening, stretching, core stability, or McKenzie exercises, were suggested by those with the highest point totals [27]. Since most of the evidence-based interventions had not been put to the test in a randomized controlled trial, this was one of the weaknesses mentioned. Furthermore, the scientists noted that there was no correlation between the app's quality and user ratings either online or within the app.

As a result, they came to the conclusion that user reviews are not reliable measures of app quality. This could be because a pre-exercise questionnaire evaluating preconditions like comorbidities or prior surgeries was absent. Additionally, the users' levels of experience could vary. This study has a number of drawbacks. We excluded [physical therapy] from the search parameters since we thought it might yield articles about general back discomfort or diet apps. Because of the variability of the data and the poor quality of the individual studies (range of bias scores 1–3/5), a meta-analysis was not carried out. Nonetheless, these research stand as the most significant illustrations in this area. The visual analogue pain scale was the constant element across the investigations. Furthermore, the follow-up period varied from four weeks to six months. Additionally, a variety of patient-reported outcome measures were employed, such as the Korff score, PHQ-9, the Oswestry Disability Index, the SF-36, Likert, and present symptoms.

FINAL THOUGHTS

Application-based rehabilitation is just as effective as traditional physiotherapy for back pain and after spine surgery. The incorporation of application-based rehabilitation into healthcare is promising, particularly for motivated patients who frequently participate in independent rehabilitation, even if no significant differences were observed between the two groups. Furthermore, this is a great strategy that could further reduce healthcare expenses for people who are unable to see physiotherapists, such as during pandemics or because they live in rural areas.

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