

Variables Describing Individuals With Improved Pain and Function With a Primary Complaint of Low Back Pain: A Secondary Analysis

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ABSTRACT

Objectives: The purpose of this study was to identify descriptive factors in individuals with a primary complaint of low back pain (LBP) associated with improved pain and function after receiving physical therapy for LBP with or without manual therapy and exercise directed at the femoroacetabular joints.

Methods: Participants were enrolled in a randomized clinical trial investigating physical therapy interventions for their LBP, with or without interventions directed at the femoroacetabular joints (hips). A participant was deemed recovered if all of the following were met: Numeric Pain Rating Scale (NPRS) score of ≤ 2 points, $\leq 10\%$ on the modified Oswestry Disability Index at discharge, and a global rating of change score of +4 at both 2 weeks and discharge. Logistic regression modelling determined descriptor variables that best predicted treatment recovery.

Results: Data from 90 participants were included in the analysis, with 44% (n = 40) achieving recovery by discharge from physical therapy (average 7.95 [± 4.68] visits). The variables of concurrent hip problems, lower body mass index ≤ 25.4 , an irritable condition, and a baseline NPRS score of 4 points or less were retained in the final model ($R^2 = .384$). Having a concurrent hip problem had the highest odds of achieving recovery in the model (odds ratio: 5.34, 95 % confidence interval: 1.31-21.8).

Conclusions: The findings for the patients in this study suggest that those with a concurrent hip problem, a lower body mass index, irritable symptoms, and a baseline NPRS score of 4 points or less were associated with greater odds of achieving recovery with multimodal physical therapy interventions. Further research should continue to investigate the interplay between the lumbar spine and hip joints. (*J Manipulative Physiol Ther* 2018;xx:1-8)

Key Indexing Terms: *Low Back Pain; Rehabilitation*

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INTRODUCTION

Low back pain (LBP) is common among adults worldwide, with a global point prevalence of 9.4%.¹ Low back pain ranks highest for years lived with disability among all health conditions, and sixth for overall burden, according to the Global Burden of Disease study.¹ One possible contributor to LBP symptoms is the hip joint. In 1983, Offierski and MacNab coined the term “hip-spine syndrome” to describe the relationship between degenerative lumbar spinal stenosis and osteoarthritis of the femoroacetabular joints.² This association has been further supported by a study demonstrating a significant association between radiographic morphology of osteoarthritis of the femoroacetabular joints (hips) and degeneration of the lumbar spine.³ Intervention studies have shown that

patients who have a total hip arthroplasty for osteoarthritis experienced a significant reduction in LBP and disability⁴ and that nonsurgical physical therapy interventions targeting 1 or both hips for individuals with LBP may improve outcomes for LBP.⁵⁻⁷

Bade et al randomized participants with a primary complaint of LBP to receive either a pragmatic LBP treatment approach only vs pragmatic LBP treatment plus a prescriptive set of manual therapy and exercise specifically targeting 1 or both hips.⁷ The results of this trial demonstrated small to moderate effect sizes for LBP and disability favoring a multimodal physical therapy regimen that included intervention targeting the hips. The perceived global rate of improvement and patient satisfaction were higher in the group that received the hip intervention in addition to treatment targeting their LBP.

Given that there is emerging evidence indicating that intervention for the hips may be beneficial for some individuals with LBP, the authors aimed to investigate if there were any baseline characteristics that would assist with identifying which individuals with LBP may respond more favorably to physical therapy interventions targeting the hips. The purpose of this investigation, therefore, was to identify a set of potential descriptor baseline characteristics that assist in identifying individuals who are likely to achieve recovery after multimodal physical therapy interventions targeting their LBP with or without interventions targeting the hips.

METHODS

Participants

The study sample was from a previous randomized clinical trial investigating the effects of 2 different treatment regimens: pragmatic physical therapy for LBP only compared to pragmatic physical therapy for LBP with the addition of prescriptive hip manual therapy and exercise (NCT01900925).⁷ The present study utilized data from this previous trial that enrolled consecutive participants ($n = 90$) presenting to physical therapy clinics with a primary complaint of LBP from September 2013 to September 2015. All participants provided informed consent. The trial was approved by the Walsh University Institutional Review Board (protocol 13-41), while this secondary analysis was approved by the University of Newcastle's Human Research Ethics Committee (protocol H-201-0078).

The participants were recruited during routine clinical practice at multiple physical therapy sites, including hospital-based centers, outpatient private locations, and university locations. The locations of data collection included 5 within the United States and 1 at an international location in Santiago, Chile. Inclusion criteria were age ≥ 18 years, $\geq 20\%$ on the modified Oswestry Disability Index (ODI), baseline score on the Numeric Pain Rating Scale

(NPRS) ≥ 2 out of 10 points, and participants needed to demonstrate a within-session change (improvement) in pain or range of motion during the examination. Exclusion criteria were the presence of red flags (ie, metabolic disease, tumor, rheumatoid arthritis, osteoporosis, prolonged history of corticosteroid usage), signs of nerve root compression (straight leg raise $\leq 45^\circ$, myotome lower extremity muscle weakness, diminished sensation, and deep tendon reflexes), prior lumbar surgery, or current pregnancy.⁷

Study Design

Original Study. Background information on the original study is provided to give context to the current study. In the original study, eligible participants were randomized to receive pragmatic interventions targeting the LBP only or to receive a pragmatic LBP treatment plus a prescriptive set of manual therapy and therapeutic exercises targeting both hips.

Upon enrollment in the study, participants gave informed consent, completed baseline questionnaires and medical screening forms, and underwent a physical examination of their lumbar spine and hip regions. Participants completed a medical intake form and provided baseline measures for the modified ODI and NPRS. [Figure 1](#) depicts a flow diagram of the original study.

Each participant received a standardized history and physical examination by the physical therapist. Each physical therapist involved in data collection received training on the examination procedures prior to beginning data collection. Further details regarding the examination procedures can be found elsewhere.⁷ The primary outcome measures included the modified ODI and NPRS scales. These outcome measures were administered at each time point, including baseline, 2 weeks, and discharge. Secondary outcome measures, including global rating of change (GROC), were collected at 2 weeks and discharge (average 7.95 [± 4.68]). Full descriptions of these outcome measures can be found elsewhere.⁷

Participants who were enrolled in the original study were randomized to receive pragmatic LBP only interventions that were at the discretion of the treating physical therapist. Participants that were randomized to the pragmatic LBP plus hip manual therapy and exercise group received a pragmatic approach to the interventions for the LBP plus a series of therapeutic exercises and nonthrust passive joint mobilizations directed at the hips. The nonthrust mobilizations for the hip included 3 30-second bouts of grade III-IV oscillatory movements, including long axis distraction, anterior to posterior and posterior to anterior accessory movements in a combined position of flexion, abduction, and external rotation.⁸ The therapeutic exercises included side-lying resisted hip external rotation with hips and knees flexed ("clamshells"), quadruped unilateral hip extension, and hook-lying unilateral bridging.⁷

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