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ORIGINAL RESEARCH

Health Behavior Change Counseling in Surgery for Degenerative Lumbar Spinal Stenosis. Part II: Patient Activation Mediates the Effects of Health Behavior Change Counseling on Rehabilitation Engagement

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Abstract

Objective: To determine the effect of health behavior change counseling (HBCC) on patient activation and the influence of patient activation on rehabilitation engagement, and to identify common barriers to engagement among individuals undergoing surgery for degenerative lumbar spinal stenosis.

Design: Prospective clinical trial.

Setting: Academic medical center.

Participants: Consecutive lumbar spine surgery patients (N = 122) defined in our companion article (Part I) were assigned to a control group (did not receive HBCC, n = 59) or HBCC group (received HBCC, n = 63).

Intervention: Brief motivational interviewing–based HBCC versus control (significance, $P<.05$).

Main Outcome Measures: We assessed patient activation before and after intervention. Rehabilitation engagement was assessed using the physical therapist–reported Hopkins Rehabilitation Engagement Rating Scale and by a ratio of self-reported physical therapy and home exercise completion. Common barriers to rehabilitation engagement were identified through thematic analysis.

Results: Patient activation predicted engagement (standardized regression weight, .682; $P<.001$). Postintervention patient activation was predicted by baseline patient activation (standardized regression weight, .808; $P<.001$) and receipt of HBCC (standardized regression weight, .444; $P<.001$). The effect of HBCC on rehabilitation engagement was mediated by patient activation (standardized regression weight, .079; $P = .395$). One-third of the HBCC group did not show improvement compared with the control group. Thematic analysis identified 3 common barriers to engagement: (1) low self-efficacy because of lack of knowledge and support (62%); (2) anxiety related to fear of movement (57%); and (3) concern about pain management (48%).

Conclusions: The influence of HBCC on rehabilitation engagement was mediated by patient activation. Despite improvements in patient activation, one-third of patients reported low rehabilitation engagement. Addressing these barriers should lead to greater improvements in rehabilitation engagement.

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Degenerative lumbar spine disorders are the leading cause of disability,[1] comprising a proportion larger than that of all other musculoskeletal conditions combined.[2] Surgery is indicated in the management of patients with severe neurogenic claudication caused by degenerative spinal stenosis when nonoperative treatment has failed.[3] Annual Medicare spending on spine surgery (one of the fastest growing inpatient procedures, especially among those aged >50y[4]) has increased to more than $1 billion,[5] similar to the per-patient costs associated with diabetes and cardiovascular disease.[6] The surgical technique for

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lumbar degenerative conditions is well established, and the benefits of surgical care have been documented.[7,8] The Spine Patient Outcomes Research Trial[9] found that surgery led to significant reduction in pain and disability and improvement in health status at 2 and 4 years after surgery. However, even with appropriate patient selection, up to 40% of patients treated surgically report persistent pain, disability, and poor quality of life, and approximately 20% of patients require reoperation.[10-13]

Although there is strong evidence for the benefits of post-surgical intensive exercise programs on short-term functional status and earlier return to work (see Part I of our companion article), such rehabilitative exercise programs require active participation and engagement on the part of the patient. The importance of individuals actively participating in their own health and recovery has been highlighted by recent research on the role of patient activation.[14-16] Patient activation measures an individual's propensity to engage in positive health behavior. Promoting patient activation is a core component to patient-centered care.[17] The goal of addressing patient activation and engagement is to overcome a major limitation in the treatment of persons undergoing lumbar spine surgery: the lack of effective methods to increase patient participation and responsibility in those who are at high risk for poor outcomes. It has been argued that empowering and engaging patients through increasing patient activation is critical to addressing this problem and is the central distinction between patient-centered care and other health care quality improvement initiatives.[18,19] Previous work has shown the relationship between high patient activation and high rehabilitation engagement[20] and better functional recovery.[21] Patients with low activation are less likely to attend prescribed physical therapy (PT) sessions and are rated as less engaged by their therapists than individuals with high activation. In addition, patients with high activation experience a greater reduction in disability and a greater improvement in physical function after surgery compared with individuals with low activation.[21]

Health behavior change counseling (HBCC) is a brief telephone-administered intervention, based on the principals and strategies of motivational interviewing (MI), to improve rehabilitation engagement among individuals undergoing spine surgery.[22] Interventions based on MI and delivered via telephone have been shown to lead to improved health and functional status among individuals with multiple sclerosis[23,24] and moderate to severe traumatic brain injury. In our companion article (Part I), we showed that persons who received the HBCC intervention had better rehabilitation engagement after undergoing lumbar spine surgery compared with those who did not receive the HBCC intervention.

Our objectives for the current analysis were to (1) determine whether changes in patient activation mediate the relationship between HBCC and rehabilitation engagement, and (2) use qualitative methods to identify the barriers to rehabilitation engagement.

List of abbreviations:

HBCC	**health behavior change counseling**
HEP	**home exercise program**
HRERS	**Hopkins Rehabilitation Engagement Rating Scale**
MI	**motivational interviewing**
PT	**physical therapy**

Methods

Our institutional review board approved this study. Informed consent was obtained from all participants. We conducted all research-related events in a private room to ensure confidentiality.

Study population

This study was conducted in 122 individuals undergoing lumbar spine surgery who were assigned to a control group (did not receive HBCC, n=59) or HBCC group (received HBCC, n=63). For additional details on the study population, see our companion article (Part I).

Participant assessment

Patients were assessed with the Patient Activation Measure, the Hopkins Rehabilitation Engagement Rating Scale (HRERS), and self-report of PT/home exercise program (HEP) completion.

Demographic and social information

We used a patient-completed questionnaire to gather sociodemographic information (eg, age, sex, race/ethnicity, education, household income; see Part I).

Patient activation

The Patient Activation Measure is a participant-completed 13-item questionnaire that addresses key psychological factors and personal competencies related to engagement in health behavior.[25] The validity of the scale has been established through correlation with key clinical indicators, such as overall self-efficacy to participate in PT[26] and self-management behaviors.[25] The Patient Activation Measure has been shown to be a reliable and valid assessment of patient activation in a cohort of individuals about to undergo surgery for low back pain.[26] In our study population, patient activation was assessed before and after the intervention.

Engagement in rehabilitation

Engagement in rehabilitation was measured with the physical therapist–reported HRERS[27] and self-reported attendance in PT and HEP based on assessments after 6 weeks of PT (see Part I). The HRERS allows the physical therapist to rate a patient's engagement across 5 items (attendance, need for additional prompts, positive attitude, acknowledged need for rehabilitative services, active participation) using a 6-point scale ranging from "never" to "always."

Statistical analyses

We based our analysis on our conceptual understanding of the role of patient activation in rehabilitation engagement and outcomes after spine surgery (fig 1). To estimate the mediation effect of patient activation on the relationship between HBCC and engagement in rehabilitation, we used structural equation modeling. Structural equation modeling provides estimates of the magnitude and significance of hypothesized connections between sets of variables. Compared with multiple regression, structural equation modeling has 2 major advantages: it allows (1) the specification and testing of multiple mediators in a single model, and (2) the use of multiple indicators to measure latent constructs—thereby increasing the reliability of parameter estimates