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The role of perceived injustice in the prediction of pain and function after total knee arthroplasty

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ABSTRACT

Emerging evidence suggests that the appraisal of pain and disability in terms of justice-related themes contributes to adverse pain outcomes. To date, however, research on the relation between perceived injustice and pain outcomes has focused primarily on individuals with musculoskeletal injuries. The primary aim of this study was to investigate the role of perceived injustice in the prediction of pain and disability after total knee arthroplasty (TKA). The study sample consisted of 116 individuals (71 women, 45 men) with osteoarthritis of the knee scheduled for TKA. Participants completed measures of pain severity, physical disability, perceptions of injustice, pain catastrophizing, and fear of movement before surgery, and measures of pain and disability 1 year after surgery. Prospective multivariate analyses revealed that perceived injustice contributed modest but significant unique variance to the prediction of postsurgical pain severity, beyond the variance accounted for by demographic variables, comorbid health conditions, presurgical pain severity, pain catastrophizing, and fear of movement. Pain catastrophizing contributed significant unique variance to the prediction of postsurgical disability. The current findings add to a growing body of evidence supporting the prognostic value of perceived injustice in the prediction of adverse pain outcomes. The results suggest that psychosocial interventions designed to target perceptions of injustice and pain catastrophizing before surgery might contribute to more positive recovery trajectories after TKA.

1. Introduction

Arthritis is the leading cause of disability in North America. Osteoarthritis (OA) is the most common form of arthritis, affecting approximately 27 million people in the United States and 4 million people in Canada [1,12,31]. In advanced stages of the disease, joint deterioration can lead to significant pain and limitations of function [19]. Patients with severe symptomatic OA of the knee may be considered candidates for knee replacement surgery (total knee arthroplasty; TKA). Although TKA yields significant benefit, research suggests that 20% of patients will have a problematic course of recovery characterized by prolonged and intense pain, mobility restriction, and reduced quality of life [3,8,30].

Research indicates that psychological factors are significant determinants of surgical outcomes after TKA. For example, presurgical scores on measures of pain catastrophizing have been shown to predict the severity of pain and disability after TKA [17,21,43,62]. High scores on presurgical measures of fear of movement and depression also have been shown to predict problematic recovery after TKA [9,10,62].

Recent research has drawn attention to another psychological predictor of problematic recovery outcomes. Individuals who interpret their health challenges in relation to themes of injustice seem to be particularly susceptible to prolonged and complicated trajectories of recovery [55]. In the context of debilitating injury and chronic pain, perceived injustice has been conceptualized as an appraisal process characterized by a tendency to construe one's losses as severe and irreparable, and to attribute blame to others

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for one's suffering [55]. Several investigations have shown that perceptions of injustice are associated with poor physical recovery and prolonged work disability in individuals who have sustained musculoskeletal injuries [49,55,63].

There is a basis for proposing that perceptions of injustice might also play a role in recovery from TKA. For many individuals, the severity of OA symptoms will peak as they approach their retirement years [1,40]. Thus, a time that was intended to allow for the realization of many life dreams becomes characterized by suffering and disability. Themes of loss and injustice are reflected in the accounts and narratives of individuals with OA [16,23,64]. The severity of suffering and the multitude of losses that accompany OA might set the stage for the emergence of injustice appraisals. In turn, injustice appraisals might trigger a cascade of psychological and physiological changes that ultimately compromise an individual's recovery potential [48,59]. To date, the relation between perceived injustice and postsurgical outcomes has not been systematically examined in individuals undergoing TKA.

The purpose of the present study was to determine the prognostic value of perceived injustice in predicting pain and disability outcomes after TKA. The identification of psychological risk factors for problematic TKA outcomes might contribute to the empirical foundation for the development of new avenues of intervention aimed at promoting successful recovery after TKA.

2. Methods

2.1. Participants

The study sample consisted of 116 (71 women and 45 men) individuals who were scheduled for TKA at 1 of 3 hospitals in eastern Canada. The mean age of the sample was 67 years, with a range of 50 to 85 years. Sixty-four patients had TKA of the right knee, and 52 had TKA of the left knee. The mean presurgical body mass index (BMI) was 30.9, with a range of 20 to 45.2. The average duration of illness was 7.6 years. The majority of participants were married (85%) and had completed at least 12 years of education (90%).

2.2. Measures

2.2.1. Perceived injustice

The Injustice Experiences Questionnaire (IEQ-chr) was used to assess illness-related perceptions on injustice. The IEQ-chr is a 12-item measure assessing individuals' appraisals of their illness in terms of the severity and irreparability of losses ("My life will never be the same"), unfairness ("It all seems so unfair"), and blame ("I am suffering because of someone else's negligence"). The IEQ-chr uses a 5-point Likert-type scale with responses ranging from 0 = never to 4 = all the time. To be appropriate for use with TKA patients, the instructional set of the original IEQ [55] was reworded to ask patients to assess the effects of their chronic condition on their life, as opposed to the effects of their injury. The suffix "chr" (for chronic) was added to the scale name to distinguish it from the original version. The psychometric properties of the IEQ-chr are similar to those that have been reported with the original version of the IEQ [55,66]. The IEQ yields 2 correlated factors, severity/irreparability and blame/unfairness [45,55,66]. In the current sample, the coefficient alpha for the IEQ-chr was .89.

2.2.2. Pain catastrophizing

The Pain Catastrophizing Scale (PCS) is a 13-item measure that assesses thoughts and feelings related to the experience of pain [58]. The PCS is composed of 3 subscales: rumination, magnification, and helplessness. Participants respond to items using a 5-point Likert-type scale with response options ranging from 0 = not at all to 4 = all the time. The scale has been shown to have high internal consistency (Cronbach's alpha [15] total = .87; rumination = .87, magnification = .66, helplessness = .78) and to be associated with heightened pain and disability in patients with various health conditions, including osteoarthritis [17,43,51,58,62].

2.2.3. Fear of movement/re-injury

The Tampa Scale for Kinesiophobia-13 (TSK-13) is a 13-item measure used to assess pain-related fear of movement or re-injury [14]. The TSK-13 contains 13 items from the original TSK-17 [32] and uses a 4-point Likert-type scale with response options ranging from 1 = strongly disagree to 4 = strongly agree. High scores on TSK-13 and TSK-17 have been associated with physical disability and pain in patients with various conditions, including OA [24,25,42,46,60]. The TSK-13 has been shown to have high internal reliability (Cronbach alpha = .86) [14].

2.2.4. Comorbidities

Hypertension, osteoarthritis of other joints, diabetes mellitus, and chronic obstructive pulmonary disease are among the common comorbid conditions that can affect TKA outcomes. Comorbidity was assessed with the Charlson Comorbidity Index [13]. Respondents were asked to indicate the presence and severity of 13 different health conditions. A total score is calculated by summing the presence of different conditions indicated by the respondent [13].

2.2.5. Pain and function

The Western Ontario and McMaster University Osteoarthritis Index (WOMAC) was used to evaluate pain and physical function [5]. The WOMAC is a self-administered questionnaire composed of 3 subscales: Pain, Stiffness, and Function. The WOMAC uses a 5-point Likert scale with responses ranging from 0 = none to 4 = extreme. In the current study, only the subscale scores for pain and function were utilized. Higher scores represent worse pain (ranging from 0 to 20) and function (ranging from 0 to 68). To allow for cross-study comparison, the scores of WOPAIN and WOFUNC were converted to 0–100 range [7,11]. The WOMAC has been shown to be a valid and a reliable instrument for assessing health functioning in OA patients, and has been shown to be sensitive to changes in health functioning in patients who underwent TKA [4–6].

3. Procedure

Patients in the current study were recruited at 1 of 3 hospitals where they were scheduled for TKA. They were invited to participate in the research and were informed that the study was concerned with the physical, psychological, and social determinants of recovery after surgery. All patients provided written informed consent as a condition of participation and received $25 as compensation for completing the questionnaires. The research was approved by the Research Ethics Boards of the McGill University Health Centre, the Hôpital Maisonneuve-Rosemont, and the Capital Health Authority of Nova Scotia. Participants completed questionnaires at the time of their presurgical evaluation (within 4 weeks of surgery) and at their 1-year postsurgical follow-up. Surgeries were performed by 11 surgeons from 3 different hospitals. By clinical standards, all patients in the study sample were considered surgical successes. Findings from cross-sectional analyses on a subsample of these data assessed before surgery have been reported in a previous article [66].

3.1. Data analysis

All variables used in hypothesis testing were normally distributed. Descriptive statistics were computed for all presurgical and postsurgical measures. Independent sample *t* tests were computed