**Supplemental Digital Content**

**Table 2. Quality Appraisal & Data Extraction of Studies that Examined the Impact of Bias on Musculoskeletal Pain Outcomes**

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| **Authors** | **Purpose** | **Study Design and Sample** | **Study Measures** | **Main Findings** |
| Anastas et al., 2020  QAS 9/13 | Examine the effects of patient race and socioeconomic status on providers’ chronic pain decisions and the extent of providers’ implicit and explicit attitudes about race and socioeconomic were related to these decisions. | Secondary analysis of baseline data from an RCT testing a virtual perspective-taking intervention among providers with 12 computer-simulated patients with chronic low back pain (n=436 physician residents/fellows) | Implicit Association Tests (race and SES)  Feeling Thermometer Scale (explicit attitudes)  Marlow-Crowne Social Desirability Scale  Workplace accommodation [O]  Opioid prescription [O]  Opioid contract [O] | Three significant race x SES interactions were identified: (1) among high SES patients, pain interference was rated higher for Black v White patients, with the opposite finding for low SES patients; (2) among high SES patients, distress was rated higher for Black v White patients; (3) for low SES patients, White v Black patients were more likely to be recommended workplace accommodations; Black v White patients were more likely to be prescribed opioids, and all low v high SES patients were more likely to have the physician initiate an opioid contract. |
| Anderson, Gianola, Perry, & Reynolds Losin, 2020  QAS 6/8 | Examine effects of clinician-patient sociocultural group concordance on pain report using lab-created groups and simulated clinical interactions. | Prospective, cross-sectional; 13 participants played role of clinician (6 female, 5 Black, 4 Hispanic, 4 White) and 107 adults played role of patient (47 female, 37 Black, 34 Hispanic, 36 White) | Perceived Similarities Measure Similarity Visual Analog Scale  Pain numeric rating scale [O]  Skin Conductance Response [O]  Experience of Discrimination Scale  Medical Mistrust Survey  Barratt Simplified Measure of Social Status  Multigroup Ethnic Identity Measure | Clinician-patient racial/ethnic concordance reduced self-reported and physiological indicators of pain for Black patients, did not influence pain for White patients, and increased pain report in Hispanic patients. The influence of concordance was largest for patient who reported prior experiences with or current worry about racial/ethnic discrimination. |
| Dugan et al., 2017  QAS: N/A | Examine how chronic discrimination contributes to pain within multiple racial/ethnic groups over time. | Retrospective, Longitudinal; 3,056 African American, White, Chinese, Hispanic and Japanese women from the Study of Women’s Health Across the Nation | Everyday Discrimination Scale  SF-36 [O] | Chronic everyday discrimination was associated with more bodily pain in all ethnic groups. In fully-adjusted models, discrimination remained a significant predictor of pain for African American, Chinese and Hispanic women. |
| Grant et al., 2020  QAS: 8/13 | To determine how White providers’ trait-level intergroup anxiety and state-level discomfort impact their pain treatment recommendations for Black patients. | Secondary analysis of baseline data from an RCT testing a virtual perspective-taking intervention among providers with 12 computer-simulated patients with chronic low back pain (n=297 White physician residents/fellows) | Intergroup Anxiety Scale  Provider state-level comfort level [O] (VAS for providing care, prescribing oral opioids, referral to pain specialist, physical therapy or non-opioid analgesics) | White providers with higher trait-level intergroup anxiety reported lower state-level comfort treating Black patients, were more likely to recommend opioids and referral to pain specialist, but less likely to recommend non-opioid analgesics. |
| Guillermo & Barre-Hemingway, 2020  QAS: 10/13 | Test assessment of adolescent pain and treatment recommendations in vignette cases that reflected patient-provider racial concordance or discordance. | Prospective cross-sectional design with medical professionals (n=89), who identified as Black (n=34) or White (n=55) | Medical vignettes of a lower extremity injury and asthma case with patients of different races; participants were asked to provide treatment recommendation scored as optimal or adequate treatment [O] | No race-based differences in pain estimates or agreement with treatment were found. However, opioid analgesic treatment for acute pain was more strongly associated with racially concordant v discordant scenarios. |
| Hirsh et al., 2020  QAS: 8/8 | Examine how patient race and previous opioid misuse behaviors impact providers’ risk assessments for future prescription opioid-related problems using patient videos and vignettes. | Prospective lens model design (n=135 physician residents/fellows) | Race Implicit Association Test  Race/Ethnicity Expectations of Pain Questionnaire  Risk perceptions (study specific) [O] | Providers rated Black patients and patients with previous misuse as having greater risk for future misuse/abuse of prescription opioids; patients with previous misuse were perceived to be at greater risk of addiction; Black patients without previous misuse were perceived to be at greater risk for future adverse events, or diversion when previous misuse was present. |
| Miller et al., 2021  QAS: 8/8 | Examine pain-related injustice and catastrophizing appraisals as candidate mediators of the relationship between baseline pain intensity and 3-month functional outcomes in adolescents with chronic pain. | Prospective longitudinal study (n=89 youth with chronic pain) | Injustice Experiences Questionnaire  Pain Catastrophizing Scale for Children  Numeric Pain Rating Scale  Functional Disability Inventory [O]  Pediatric Quality of Life Inventory [O] | Injustice mediated the relationship between pain intensity and 3-month quality of life; specifically injustice mediated 3-month emotional functioning while catastrophizing mediated 3-month social functioning. |
| Morais et al., 2021  QAS: 8/8 | Examine the association between psychological resilience and pain, and the moderating role of race across these relationships in older adults with chronic low back pain | Secondary analysis; 45 NHW and 15 NHB with chronic low back pain | Gratitude Questionnaire  Brief Resilience Scale  PROMIS Emotional Support  Short Physical Performance battery (function and movement-evoked pain) [O] | Higher levels of gratitude and trait resilience were protective against movement-evoked pain in NHWs. However, higher level of gratitude in NHBs was associated with lower functional performance. |
| Morrison et al, 2021  QAS: 7/8 | Examine racial/ethnic differences in nonverbal pain behaviors and pain management among residents with self-assessed pain | Retrospective longitudinal; 944,510 newly admitted nursing home residents | Documentation of vocal complaints of pain and pain behaviors  Pharmacologic pain intervention [O] | Vocal complaints were most commonly recorded; pain behavior documentation was less frequent among NHB and Hispanic residents and they were less likely to receive any type of pharmacologic pain intervention than NHWs |
| Penn et al., 2020  QAS: 7/8 | Examine whether perceived injustice helps explain the relationship between chronic pain stigma and movement-evoked pain severity among patient with chronic low back pain | Prospective cross sectional study of 105 patients with chronic low back pain | Internalized Stigma of Chronic Pain Scale  CES-D  Injustice Experience Questionnaire  Short Physical Performance Battery  Numeric rating scale (movement-evoked pain) [O] | Perceived injustice significantly mediated the association between chronic pain stigma and chronic low back pain severity and physical function. Greater chronic pain stigma was associated with greater perceived injustice and greater movement-evoked pain severity. |
| Terry et al., 2020  QAS: 5/8 | Examine the associations between everyday experiences of discrimination and clinical pain, disability and functional performance among NHB and NHW persons with or at risk of knee osteoarthritis | Prospective cross-sectional; 188 community-dwelling adults with unilateral or bilateral knee pain | Experiences of Discrimination  Perceived Stress Scale  Coping Strategies Questionnaire – Revised  Pain Catastrophizing subscale  Western Ontario and McMaster Universities Osteoarthritis Index [O]  Graded Chronic Pain Scale [O] Short Physical Performance Battery [O] | NHB persons reported experiencing significantly higher levels of discrimination, greater pain catastrophizing, higher clinical pain and disability compared to NHW. Perceived stress and pain catastrophizing mediated the relationship between discrimination and outcome variables in women. |
| Trost et al., 2019  QAS: 6/8 | Examine the association between perceived injustice and pain, disability and depression in a diverse community sample of patients with chronic low back pain. | Prospective cross sectional; 154 community-dwelling adults with chronic low back pain | McGill Pain Questionnaire – short form [O]  Roland Morris Disability Questionnaire [O]  Pain Disability Index [O]  PHQ-9 [O]  Injustice Experiences Questionnaire  Pain Catastrophizing Scale | Perceived injustice predicted worse pain outcomes with effects partially mediated by anger. NHB participants reported higher perceived injustice, depression, and pain-related disability than Hispanics and NHW. |
| Ziadni et al., 2020  QAS: 6/8 | Examine the relationship between past experiences of racial discrimination and pain-related outcomes (disability and depression). | Prospective, cross-sectional; 137 individuals with chronic low back pain | Brief Perceived Ethnic Discrimination Questionnaire-Community Version  Pain Catastrophizing Scale  Injustice Experience Questionnaire  Roland Morris Disability  Questionnaire [O]  PHQ-9 [O]  Pain Rating Index of the MPQ-SF [O] | Prior discriminatory experiences were positively associated with disability and depression. Pain-related appraisals of injustice mediated the relationship; discrimination and perceived injustice were significantly stronger in NHB and Hispanic individuals compared to NHW. |

**Abbreviations: NHB = non-Hispanic Black; NHW = non-Hispanic White; [O]=Outcome variable; QAS=Quality assessment score**

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