# Racism as a Source of Pain

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The epidemic of chronic pain, affecting approximately 20% of Americans and estimated to cost $600 billion per year, exacts a tremendous personal, economic, and societal toll.[1,2] Though various social groups experience heightened rates of trauma, discrimination, and pain, here we focus on Black Americans, given their unique history of anti-Black racism in the United States (US) context. We propose that racism is an overlooked but preventable source of, or exacerbating factor for, chronic pain and its consequences, and we advance a framework offering innovative pathways for research, treatment, advocacy, and policy.

## RACIAL INEQUITIES IN CHRONIC PAIN

Structurally marginalized groups, particularly Black Americans, experience heightened exposure to adverse environmental and social conditions as a result of racism, placing them at increased risk for unjust chronic pain and suffering.[3] Numerous studies indicate that Black Americans have more severe pain, pain-related disability, and other pain-related outcomes (e.g., disturbed sleep) compared to their White counterparts.[4–8] This inequity is due in part to the well-replicated finding that Black Americans are less likely to be screened for pain, referred for pain management, and adequately treated than White Americans.[9–13] These health care inequities are built upon historically rooted and unfortunately persistent beliefs that Black people feel less pain than White people—harmful myths that have persisted since slavery.[14] We propose that racism is a key determinant of the disproportionate burden of severe pain among Black Americans.

The disproportionate pain experience of minoritized racial groups in the US, including though not limited to Black Americans, is found in both clinical and laboratory studies[15–17] and stems from more than health system and treatment disparities.

## THE BRAIN AS A KEY SOURCE OF CHRONIC PAIN

Recent advances in theory and research highlight the fundamental role of the brain in the development and maintenance of chronic pain.[18,19] In contrast to the traditional medical conceptualization, tissue pathology is not required for the experience of pain. Psychosocial factors—stemming from both internal and external experiences—impact pain through neurologically mediated processes, such as augmenting nociception (activation of bodily pain receptors and pathways) and even generating or constructing the experience of pain when there is little or no tissue pathology and nociception, i.e., nociplastic pain.[20–22]

The emerging model of predictive processing delineates how the brain generates all of our perceptions, including vision, audition, and the interoception of bodily pain sensations and somatic symptoms. Such perception is constructed or "predicted" from our past experiences, present physical and social environment, emotionally salient input, and nociceptive inputs.[22] The shift to a predictive processing model suggests that tissue pathology is but one contributor to chronic pain and may be minimal or absent in many common pain conditions, including headaches, neck and back pain, irritable bowel syndrome, and fibromyalgia.[23] The predictive processing model, in contrast to the medical model, allows for social, cultural, cognitive, emotional, and behavioral factors to play contributory or causal roles in the presence, duration, and intensity of pain.

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Numerous studies confirm that psychosocial trauma, adversities, or stressors throughout the life course—even in the absence of a diagnosis of PTSD—are important in the development, maintenance, and severity of chronic pain.[24–27] Such stressful experiences, whether current or from one's past, alter cognitive-affective processes regulating the brain's neural circuitry for pain.[28–31] One useful model is that pain is a brain-based danger alarm signal that can be activated not only by peripheral tissue damage but also by the perception of other dangers. With ongoing threats of either a somatic or psychosocial nature, pain can become chronic.[28,29,32]

Is such brain-based or "centrally-mediated" pain a "false" pain experience? Absolutely not. The pain is real and driven by the same brain mechanisms causing pain in physical injuries: the brain's protective response to threatening information.[33,34] The field of pain medicine is poised to shift from scientifically outdated, narrow biomedical explanations for chronic pain towards more accurate, evidence-supported, and comprehensive conceptualizations of pain as a contextually driven, brain-based response, subject to both interoceptive signals and a wide range of historical, social, and psychosocial influences.[35] This newer understanding of pain allows a more accurate attribution of the sources of, and potential solutions for, the chronic pain epidemic and race-related health inequities.

## MULTIPLE LEVELS OF RACISM AS A SOURCE OF CHRONIC PAIN

Research has long shown that being Black in America is associated with continuous stress that impairs health,[36,37] though the predictive processing model has yet to be applied to the disproportionate pain experienced in US Black communities. Elevated pain severity among Black Americans compared to other racialized groups may be explained by their greater exposure to daily and major instances of discrimination and greater frequency of responding to discrimination.[38] Although potential covariates or mechanisms remain to be tested, major lifetime discriminatory events (e.g., around employment or housing) have been shown to be potent predictors of back pain among Black Americans, though show little to no association among White Americans,[39] and have a stronger impact on the development of chronic pain than daily instances of unfair treatment (e.g., receiving poorer service, being treated with less courtesy).[40] Although there are undoubtably individual differences in response, such violations are not fleeting experiences, and when internalized may activate a host of lingering psychological and physiological processes.[41–43] Moreover, racism goes well beyond biased interpersonal encounters; it operates on sociocultural, structural, and institutional levels, and does so both contemporarily and historically, passed through generations.[44–47]

We conceptualize racism as a pain source because cultural, structural, interpersonal, and individual levels of racism shape stressful and often traumatic experiences (including but not limited to poverty, community violence, and incarceration) that can activate the brain's danger-alarm pain-generating mechanism with fears of bodily as well as psychosocial threat.[48] Emerging research suggests that racism—pervasive at multiple levels—contributes to the presence or severity of chronic pain and its sequelae, directly or indirectly via neural pathways mediated by changes in psychological mechanisms.[48–50] Notably, in a US national study of middle-aged adults, researchers estimated that nearly 4.1 million adults ages 40 years or older suffered from chronic pain caused by psychologically distressing experiences prompted by encounters of daily and lifetime discrimination.[40,51] Racism may result in feeling powerless and experiencing negative emotions,[44] which can trigger or augment pain. Findings from a sample of Black/African Americans show that greater group- and self-focused internalized racism correlate with higher levels of anxiety and depressive symptoms[52]—emotional symptoms linked to brain structures implicated in the development, maintenance, and severity of chronic pain.[53]

## INTERVENTIONS TO ADDRESS RACISM AS A PAIN SOURCE

How can we intervene to address the pain and disability that is triggered, exacerbated, or prolonged by racism? Activation of the pain neural circuitry derives from racism at multiple levels, and so we need to intervene at multiple levels.[12,49,54,55] Clinicians working with individual patients ought to address the trauma of racial injustice in several ways. First, Black individuals with pain are less likely to receive intensive evaluation regarding pain and, accordingly, fewer interventions to treat pain. We encourage clinicians to consider the role of their own biases as they approach each patient, to find ways to acknowledge the role of historical and contemporary racial injustices faced by their patients in a therapeutic and respectful manner. Clinicians also should recognize that emotions such as anger, fear, and grief stem not only from living with chronic pain, but also from a personal, community-level, and cultural histories of racism-related mistreatment, threat, and loss. Clinicians often experience patients' expression of anger at their inequitable treatment by staff or the healthcare system as a threat or personal attack, though personal and professional development to understand these as reasonable and even healthy responses to unjust social as well as healthcare systems could support improved human dignity in the clinical setting and quality of care for patients with these experiences. As medical and legal systems actively discourage or punish expression of anger in the face of injustice, the clinician's recognition and validation should be the default in a clinical encounter, given that some of the most fundamental psychological needs are to be seen, heard, and understood.[56]

It also is incumbent upon physicians to perform careful clinical evaluations to assess for structural disorders that are

causing the pain. When those are absent, which is often the case in individuals with chronic pain,[57,58] the clinician should validate and clearly explain that the pain is real and assess factors that would indicate a nociplastic etiology, such as pain that is clearly spreading, inconsistent, or triggered by innocuous stimuli. Practitioners should thoughtfully and gently inquire about linkages between stressful life events—including experiences of racism and discrimination within and outside of the healthcare system—and the onset or exacerbation of pain. Doing so will provide insight into the interpersonal and individual as well as cultural, social, and structural causes of nociplastic symptoms and can be quite validating for many patients. It is necessary to offer clear and compassionate explanations of predictive processing and the role of the brain and psychosocial stressors—including racism—in generating or amplifying pain, as this understanding is a critical component of successful psychosocial treatments.[32]

Traditional behavioral or psychological therapies for chronic pain, such as cognitive behavioral therapy and acceptance or mindfulness approaches, empower patients to engage in self-care and pain self-management. However, more innovative psychological approaches,[32,59,60] such as emotional awareness and expression therapy[32,60] and pain reprocessing therapy,[61] specifically target psychosocial trauma or factors that activate the pain danger alarm, and show promise for greater pain reduction. Even these latter therapies, however, will need to broaden their view of trauma to include social injustices and systemic racism in addition to personal victimization. Such therapies and clinical encounters should support the awareness and adaptive expression of patients' grief and anger, both at social systems as well as clinicians, many of whom have been privileged by this same unjust system that leads to the pain in the patient. Liberation-focused perspectives[62] and forms of therapy, including feminist, indigenous, community-based, and other critical, strengths-based approaches, are excellent models for individual therapy in a context of an unjust society.[63,64]

It is inadequate, however, to look solely to traditional biomedical or psychological therapies to address pain that stems from ongoing and endemic racism that burdens Black Americans. This problem is endemic in chronic pain treatment research, where studies often consider individual-level variables (e.g., education, gender, age, body mass index) but rarely incorporate manifestations of structural racism (e.g., state-sanctioned violence, mass incarceration). This is an unquestionably crucial area of future research, as it would allow the field to lend stronger empirical support to the putative model of the impact of higher-order (cultural, structural, societal) factors on individuals' experience of, and adaptation to, chronic pain. We must develop a multi-faceted approach that acts on the major causes of pain not only limited to the level of the individual but also encompassing the healthcare system and societal levels. First, therefore, we must understand the impact of systemic racism on the individual pain experience and the unequal burden of pain in Black communities in the United States. This intention requires a commitment to cultural humility, which refers to a framework situating patients and practitioners within the specific social and political contexts of their lives, prioritizes patients' knowledge, and centers providers' self-reflection and recognition of their own beliefs, values, and biases.[12,65,66]

Healthcare systems also need to modify their practices. For example, creative solutions to increase access and improve clinical encounters are needed to address inequities of underestimation of pain and reduced provision of pain assessments and treatments. Awareness of such inequities should be followed by supporting policies and actions to redress harm at multiple levels. Although it is vital not to lose sight of the importance of providing optimal care to individual patients, better assessments of pain using the predictive processing model can lead to a reduction of unnecessary interventions that are costly, ineffective, and potentially counter-productive, such as invasive procedures for back pain that is brain-generated or the excessive use of opioids.[12,67–69] In addition, healthcare trainees and providers at all levels need better education in the history of societal anti-Black racism, exclusion from and disparate treatment faced by Black and other racialized groups, and a shared commitment to "know and do better." Clinicians should be taught to recognize the inequitable care that their patients have received in the past and continue to receive, and to identify alternatives to their role in perpetuating these disparate and damaging patterns. Indeed, findings from a recent longitudinal study[70] demonstrate that among patients facing significant health and social inequities, reports of more equity-oriented healthcare in primary care contexts were indirectly associated with improvements in chronic pain disability through patients' increased confidence in their ability to manage and prevent health problems as a result of greater comfort and confidence in healthcare services, accounting for demographic characteristics, experiences of discrimination, and financial strain. More generally, we encourage significant changes to clinical education around pain management. Biopsychosocial models of pain, which emphasize psychological and social contributors to pain, have existed for decades but are inadequately taught and underutilized.[35,71]

Interventions that effectively address racial inequities in chronic pain must also move beyond both the clinical and medical contexts to consider the sociocultural and structural conditions that catalyze disadvantage and poor health outcomes. Pairing cultural humility with a "racism-as-pain-source" framework can provide an opening to disrupt power imbalances within and beyond the clinical encounter. Such a perspective will help individuals and communities to take action by advocating for policies and practices that foster anti-racism across institutions, agencies, and professions, thereby advancing holistic health and well-being of everyone. We urge collective action to dismantle social systems that perpetuate racial injustice and the identification of and implementation of solutions to these social problems. Furthermore, more research is warranted that empirically documents

associations between specific manifestations of anti-Black racism and adverse health within Black populations, as has been done for community mass incarceration and future preterm birth risk.[72] We must collectively understand and then commit to dismantling systems that create and perpetuate racial inequities and to improve access to crucial resources, such as healthcare, childcare, and financial and educational resources. As an example, restorative justice interventions have been found to be effective in improving health and well-being for individuals and communities.[73]

Additional strategies can be useful as we develop interventions to address how racism produces and amplifies stress and pain while driving racial inequities in health outcomes. First, conduct multi-level interventions directly addressing upstream factors by connecting knowledge about pain, levels of racism, and systemic inequalities and understandings of social systems and structural conditions with concrete institutional and community resources and investments.[74,75] Also, support grassroots advocacy, such as the National Pain Advocacy Center, building on the expertise of community-based leaders and groups, and connecting to cross-sectoral coalitions of clinicians and healthcare providers as well as social workers, case managers, or community health workers. Movement advocacy is "the mobilizing of the people to raise awareness of an injustice and to advocate for reform."[76] Inequities in chronic pain result in large part from systemic structural racism. Breaking down structural barriers to achieve health equity will require integrating movement advocacy with relationship-building across diverse groups and stakeholders (e.g., clinicians, organizational leaders, policy makers). This includes mobilizing individuals across communities to raise awareness about injustices while simultaneously building effective coalitions to catalyze social movements to advocate for policy reform across sectors and at multiple levels—local, state, and federal. Collectively, these strategies can help mitigate upstream social, cultural, and structural barriers in ways that can improve Black health outcomes and well-being within and beyond non-healthcare settings.

Systemic racism has negative consequences for the health and well-being of our entire society. Indeed, as chronic pain is associated with substantial disability, the consequences of systemic racism on Black Americans' ability to contribute to society are large and remediable. Viewing physical pain as one of the consequences of racism and societal injustice more broadly illuminates these effects and points towards effective solutions for those afflicted with chronic pain as well as offering the potential for a more just and inclusive society.

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## REFERENCES

1. **Dahlhamer J, Lucas J, Zelaya C, et al.** Prevalence of chronic pain and high-impact chronic pain among adults—United States, 2016. *MMWR Morb Mortal Wkly Rep*. 2018;67(36):1001-1006. https://doi.org/10.15585/mmwr.mm6736a2
2. Institute of Medicine (US) Committee on Advancing Pain Research, Care, and Education. *Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research*. National Academies Press (US); 2011. Accessed March 15, 2022. http://www.ncbi.nlm.nih.gov/books/NBK91497/
3. **Maly A, Vallerand AH**. Neighborhood, socioeconomic, and racial influence on chronic pain. *Pain Manag Nurs*. 2018;19(1):14-22. https://doi.org/10.1016/j.pmn.2017.11.004
4. **Morales ME, Yong RJ**. Racial and ethnic disparities in the treatment of chronic pain. *Pain Med*. 2021;22(1):75-90. https://doi.org/10.1093/pm/pnaa427
5. **Craig KD, Holmes C, Hudspith M, et al.** Pain in persons who are marginalized by social conditions. *Pain*. 2020;161(2):261-265. https://doi.org/10.1097/j.pain.0000000000001719
6. **Meints SM, Miller MM, Hirsh AT**. Differences in pain coping between Black and White Americans: A meta-analysis. *J Pain*. 2016;17(6):642-653. https://doi.org/10.1016/j.jpain.2015.12.017
7. **Tait RC, Chibnall JT**. Racial/ethnic disparities in the assessment and treatment of pain: Psychosocial perspectives. *Am Psychol*. 2014;69(2):131-141. https://doi.org/10.1037/a0035204
8. **Knoebel RW, Starck JV, Miller P**. Treatment disparities among the Black population and their Influence on the equitable management of chronic pain. *Health Equity*. 2021;5(1):596-605. https://doi.org/10.1089/heq.2020.0062
9. National Center for Health Statistics. *Health, United States, 2015: With Special Feature on Racial and Ethnic Health Disparities*. National Center for Health Statistics (US); 2016. https://www.ncbi.nlm.nih.gov/books/NBK367640/
10. **Meghani SH, Byun E, Gallagher RM**. Time to take stock: a meta-analysis and systematic review of analgesic treatment disparities for pain in the United States. *Pain Med*. 2012;13(2):150-174. https://doi.org/10.1111/j.1526-4637.2011.01310.x
11. **Cintron A, Morrison RS**. Pain and ethnicity in the United States: A systematic review. *J Palliat Med*. 2006;9(6):1454-1473. https://doi.org/10.1089/jpm.2006.9.1454
12. **Fetta J, Evans H**. The impact of discrimination in pain management: strategies to improve pain outcomes. *Topics in Pain Manag*. 2021;37(4):1-8. https://doi.org/10.1097/01.TPM.0000798016.46041.a2
13. **Green CR, Anderson KO, Baker TA, et al.** The unequal burden of pain: confronting racial and ethnic disparities in pain. *Pain Med*. 2003;4(3):277-294. https://doi.org/10.1046/j.1526-4637.2003.03034.x
14. **Trawalter S, Hoffman KM**. Got pain? Racial bias in perceptions of pain. *Soc Personal Psychol Compass*. 2015;9(3):146-157.
15. **Anderson KO, Green CR, Payne R**. Racial and ethnic disparities in pain: causes and consequences of unequal care. *J Pain*. 2009;10(12):1187-1204. https://doi.org/10.1016/j.jpain.2009.10.002
16. **Kim HJ, Yang GS, Greenspan JD, et al.** Racial and ethnic differences in experimental pain sensitivity: systematic review and meta-analysis. *Pain*. 2017;158(2):194-211. https://doi.org/10.1097/j.pain.0000000000000731
17. **Rahim-Williams B, Riley III JL, Williams AK, Fillingim RB**. A quantitative review of ethnic group differences in experimental pain response: do biology, psychology, and culture matter? *Pain Med*. 2012;13(4):522-540.
18. **Raja SN, Carr DB, Cohen M, et al.** The revised IASP definition of pain: Concepts, challenges, and compromises. *Pain*. 2020;161(9):1976-1982. https://doi.org/10.1097/j.pain.0000000000001939
19. **Kroenke K.** Patients presenting with somatic complaints: epidemiology, psychiatric co-morbidity and management. *Int J Methods Psychiatr Res*. 2003;12(1):34-43. https://doi.org/10.1002/mpr.140
20. **Wiech K.** Deconstructing the sensation of pain: The influence of cognitive processes on pain perception. *Science*. 2016;354(6312):584-587. https://doi.org/10.1126/science.aaf8934

21. **Van den Bergh O, Witthöft M, Petersen S, Brown RJ**. Symptoms and the body: taking the inferential leap. *Neurosci Biobehav Rev*. 2017;74:185-203. https://doi.org/10.1016/j.neubiorev.2017.01.015
22. **Barrett LF, Simmons WK**. Interoceptive predictions in the brain. *Nat Rev Neurosci*. 2015;16(7):419-429. https://doi.org/10.1038/nrn3950
23. **Lee KM, Ferreira-Santos F, Satpute AB**. Predictive processing models and affective neuroscience. *Neurosci Biobehav Rev*. 2021;131:211-228. https://doi.org/10.1016/j.neubiorev.2021.09.009
24. **Anda RF, Felitti VJ, Bremner JD, et al.** The enduring effects of abuse and related adverse experiences in childhood. *Eur Arch Psychiatry Clin Neurosci*. 2006;256(3):174-186. https://doi.org/10.1007/s00406-005-0624-4
25. **Nelson SM, Cunningham NR, Kashikar-Zuck S**. A conceptual framework for understanding the role of adverse childhood experiences in pediatric chronic pain. *Clin J Pain*. 2017;33(3):264-270. https://doi.org/10.1097/AJP.0000000000000397
26. **Nicol AL, Sieberg CB, Clauw DJ, Hassett AL, Moser SE, Brummett CM**. The association between a history of lifetime traumatic events and pain severity, physical function, and affective distress in patients with chronic pain. *J Pain*. 2016;17(12):1334-1348. https://doi.org/10.1016/j.jpain.2016.09.003
27. **Fishbain DA, Pulikal A, Lewis JE, Gao J**. Chronic pain types differ in their reported prevalence of post-traumatic stress disorder (PTSD) and there is consistent evidence that chronic pain is associated with PTSD: an evidence-based structured systematic review. *Pain Med*. 2017;18(4):711-735. https://doi.org/10.1093/pm/pnw065
28. **Burke NN, Finn DP, McGuire BE, Roche M**. Psychological stress in early life as a predisposing factor for the development of chronic pain: clinical and preclinical evidence and neurobiological mechanisms. *J Neurosci Res*. 2017;95(6):1257-1270. https://doi.org/10.1002/jnr.23802
29. **Gupta A, Mayer EA, Acosta JR, et al.** Early adverse life events are associated with altered brain network architecture in a sex-dependent manner. *Neurobiol Stress*. 2017;7:16-26. https://doi.org/10.1016/j.ynstr.2017.02.003
30. **Gupta A, Kilpatrick L, Labus J, et al.** Early adverse life events and resting state neural networks in patients with chronic abdominal pain: evidence for sex differences. *Psychosom Med*. 2014;76(6):404. https://doi.org/10.1097/PSY.0000000000000089
31. **Vachon-Presseau E, Centeno MV, Ren W, et al.** The emotional brain as a predictor and amplifier of chronic pain. *J Dent Res*. 2016;95(6):605-612. https://doi.org/10.1177/00220345166380
32. **Lumley MA, Schubiner H**. Emotional Awareness and Expression Therapy for Chronic Pain: Rationale, Principles and Techniques, Evidence, and Critical Review. *Curr Rheumatol Rep*. 2019;21(7):30. https://doi.org/10.1007/s11926-019-0829-6
33. **Kross E, Berman MG, Mischel W, Smith EE, Wager TD**. Social rejection shares somatosensory representations with physical pain. *Proc Natl Acad Sci USA*. 2011;108(15):6270-6275. https://doi.org/10.1073/pnas.1102693108
34. **Eisenberger NI, Jarcho JM, Lieberman MD, Naliboff BD**. An experimental study of shared sensitivity to physical pain and social rejection. *Pain*. 2006;126(1-3):132-138. https://doi.org/10.1016/j.pain.2006.06.024
35. **Sullivan MD, Sturgeon JA, Lumley MA, Ballantyne JC**. Reconsidering Fordyce's classic article," Pain and suffering: what is the unit?" to help make our model of chronic pain truly biopsychosocial. . *Pain*. Published online 2022. https://doi.org/10.1097/j.pain.0000000000002748
36. **Sternthal MJ, Slopen N, Williams DR**. Racial disparities in health: How much does stress really matter? *Du Bois Rev*. 2011;8(1):95-113. https://doi.org/10.1017/S1742058X11000087
37. **Geronimus AT**. Understanding and eliminating racial inequalities in women's health in the United States: the role of the weathering conceptual framework. *J Am Med Womens Assoc*. 2001;56(4):133-136.
38. **Losin EAR, Woo CW, Medina NA, Andrews-Hanna JR, Eisenbarth H, Wager TD**. Neural and sociocultural mediators of ethnic differences in pain. *Nat Hum Behav*. 2020;4(5):517-530. https://doi.org/10.1038/s41562-020-0819-8
39. **Edwards RR**. The association of perceived discrimination with low back pain. *J Behav Med*. 2008;31(5):379-389. https://doi.org/10.1007/s10865-008-9160-9
40. **Brown TT, Partanen J, Chuong L, Villaverde V, Chantal Griffin A, Mendelson A**. Discrimination hurts: The effect of discrimination on the development of chronic pain. *Soc Sci Med*. 2018;204:1-8. https://doi.org/10.1016/j.socscimed.2018.03.015
41. **Jones C.** Levels of racism: A theoretic framework and a gardener's tale. *Am J Public Health*. 2000;90(8):1212-1215. https://doi.org/10.2105/AJPH.90.8.1212
42. **David EJR** (Ed.). *Internalized Oppression: The Psychology of Marginalized Groups*. Springer Publishing Company; 2013.
43. **Jackson B, Kubzansky LD, Wright RJ**. Linking perceived unfairness to physical health: The perceived unfairness model. *Rev Gen Psychol*. 2006;10(1):21-40. https://doi.org/10.1037/1089-2680.10.1.21
44. **Harrell CJP, Burford TI, Cage BN, et al.** Multiple pathways linking racism to health outcomes. *Du Bois Rev*. 2011;8(1):143-157. https://doi.org/10.1017/S1742058X11000178
45. **Beatty Moody DL, Waldstein SR, Leibel DK, et al.** Race and other sociodemographic categories are differentially linked to multiple dimensions of interpersonal-level discrimination: Implications for intersectional, health research. *PLoS One*. 2021;16(5):e0251174. https://doi.org/10.1371/journal.pone.0251174
46. **Williams DR, Lawrence JA, Davis BA**. Racism and health: Evidence and needed research. *Annu Rev Public Health*. 2019;40(1):105-125. https://doi.org/10.1146/annurev-publhealth-040218-043750
47. **Gee GC, Walsemann KM, Brondolo E**. A life course perspective on how racism may be related to health inequities. *Am J Public Health*. 2012;102(5):967-974. https://doi.org/10.2105/AJPH.2012.300666
48. **Rubin S, Burke N, Van Natta M, Yen I, Shim JK**. Like a fish out of water: Managing chronic pain in the urban safety net. *J Health Soc Behav*. 2018;59(4):487-500. https://doi.org/10.1177/0022146518798103
49. **Mathur VA, Trost Z, Ezenwa MO, Sturgeon JA, Hood AM**. Mechanisms of injustice: what we (do not) know about racialized disparities in pain. *IASP*. Published online November 1, 2021. https://doi.org/10.1097/j.pain.0000000000002528
50. **Evans MC, Bazargan M, Cobb S, Assari S**. Pain intensity among community-dwelling African American older adults in an economically disadvantaged area of Los Angeles: Social, behavioral, and health determinants. *IJERPH*. 2019;16(20):3894. https://doi.org/10.3390/ijerph16203894
51. **Green CR, Baker TA, Sato Y, Washington TL, Smith EM**. Race and chronic pain: a comparative study of young Black and White Americans presenting for management. *J Pain*. 2003;4(4):176-183. https://doi.org/10.1016/S1526-5900(02)65013-8
52. **James D.** Self- and group-focused internalized racism, anxiety, and depression symptoms among African American adults: A core self-evaluation mediated pathway. *Group Process Intergroup Relat*. Published online August 14, 2020:136843022094284. https://doi.org/10.1177/1368430220942849
53. **Zhuo M.** Neural mechanisms underlying anxiety–chronic pain interactions. *Trends Neurosci*. 2016;39(3):136-145. https://doi.org/10.1016/j.tins.2016.01.006
54. **Phelan JC, Link BG**. Is racism a fundamental cause of inequalities in health? *Annu Rev Sociol*. 2015;41:311-330. https://doi.org/10.1146/annurev-soc-073014-112305
55. **Link BG, Phelan J.** Social conditions as fundamental causes of disease. *J Health Soc Behav*. Published online 1995:80-94. https://doi.org/10.2307/2626958
56. **Reis HT, Regan A, Lyubomirsky S**. Interpersonal chemistry: What is it, how does it emerge, and how does it operate? *Perspect Psychol Sci*. Published online August 26, 2021:174569162199424. https://doi.org/10.1177/1745691621994241
57. **Yunus MB.** Fibromyalgia and overlapping disorders: the unifying concept of central sensitivity syndromes. *Semin Arthritis Rheum*. 2007;36(6):339-356. https://doi.org/10.1016/j.semarthrit.2006.12.009
58. **Hartvigsen J, Hancock MJ, Kongsted A, et al.** What low back pain is and why we need to pay attention. *The Lancet*. 2018;391(10137):2356-2367. https://doi.org/10.1016/S0140-6736(18)30480-X
59. **Abbass A, Town J, Holmes H, et al.** Short-term psychodynamic psychotherapy for functional somatic disorders: A meta-analysis of randomized controlled trials. *Psychother Psychosom*. 2020;89(6):363-370. https://doi.org/10.1159/000507738
60. **Yarns BC, Lumley MA, Cassidy JT, et al.** Emotional awareness and expression therapy achieves greater pain reduction than cognitive behavioral therapy in older adults with chronic musculoskeletal pain: a preliminary randomized comparison trial. *Pain Med*. 2020;21(11):2811-2822. https://doi.org/10.1093/pm/pnaa145
61. **Ashar YK, Gordon A, Schubiner H, et al.** Effect of pain reprocessing therapy vs placebo and usual care for patients with chronic back pain: A randomized clinical trial. *JAMA psychiatry*. 2022;79(1):13-23. https://doi.org/10.1001/jamapsychiatry.2021.2669
62. **Love BJ**. Developing a liberatory consciousness. In: Adams M, Blumenfeld WJ, Castaneda R, Hackman HW, Peters ML, Zuniga X, eds. *Readings for Diversity and Social Justice*. Vol 2. Routledge; 2000:533-540.
63. **Brown LS**. *Feminist Therapy*. American Psychological Association; 2018.

64. **Hartmann WE, Wendt DC, Burrage RL, Pomerville A, Gone JP**. American Indian historical trauma: Anti-colonial prescriptions for healing, resilience, and survivance. *Am Psychol*. 2019;74(1):6-19. https://doi.org/10.1037/amp0000326
65. **Tervalon M, Murray-García J**. Cultural humility versus cultural competence: a critical distinction in defining physician training outcomes in multicultural education. *J Health Care Poor Underserved*. 1998;9(2):117-125. https://doi.org/10.1353/hpu.2010.0233
66. **Kirmayer LJ**. Rethinking cultural competence. *Transcult Psychiatry*. 2012;49(2):149-164. https://doi.org/10.1177/1363461512444673
67. **Govender V, Penn-Kekana L**. Gender biases and discrimination: a review of health care interpersonal interactions. *Glob Public Health*. 2008;3(sup1):90-103. https://doi.org/10.1080/17441690801892208
68. **Deyo RA**. Watch your back! How the back pain industry is costing us more and giving us less. *Fam Med*. 2016;48(10):821-822.
69. **Hanscom D.** *Back in Control: A Surgeon's Roadmap out of Chronic Pain*. Vertus Press; 2017.
70. **Ford-Gilboe M, Wathen CN, Varcoe C, et al.** How equity-oriented health care affects health: key mechanisms and implications for primary health care practice and policy. *Milbank Q*. 2018;96(4):635-671. https://doi.org/10.1111/1468-0009.12349
71. **Nicholas MK**. The biopsychosocial model of pain 40 years on: time for a reappraisal? *Pain*. Published online 2022:10-1097. https://doi.org/10.1097/j.pain.0000000000002654
72. **Sealy-Jefferson S, Butler B, Price-Spratlen T, Dailey RK, Misra DP**. Neighborhood-level mass incarceration and future preterm birth risk among African American women. *J Urban Health*. 2020;97(2):271-278. https://doi.org/10.1007/s11524-020-00426-w
73. **Angel CM, Sherman LW, Strang H, et al.** Short-term effects of restorative justice conferences on post-traumatic stress symptoms among robbery and burglary victims: a randomized controlled trial. *J Exp Criminol*. 2014;10(3):291-307.
74. **Meghani SH, Polomano RC, Tait RC, Vallerand AH, Anderson KO, Gallagher RM**. Advancing a national agenda to eliminate disparities in pain care: directions for health policy, education, practice, and research. *Pain Med*. 2012;13(1):5-28. https://doi.org/10.1111/j.1526-4637.2011.01289.x
75. **Bhimani RH, Cross LJS, Taylor BC, et al.** Taking ACTION to reduce pain: ACTION study rationale, design and protocol of a randomized trial of a proactive telephone-based coaching intervention for chronic musculoskeletal pain among African Americans. *BMC Musculoskelet Disord*. 2017;18:15. https://doi.org/10.1186/s12891-016-1363-6
76. **Chin MH**. Movement advocacy, personal relationships, and ending health care disparities. *J Natl Med Assoc*. 2017;109(1):33-35. https://doi.org/10.1016/j.jnma.2016.11.003

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