Topical Review

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Mechanisms of injustice: what we (do not) know about racialized disparities in pain

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1. Introduction

Almost 20 years ago, leaders in pain disparities research challenged pain scientists and clinicians to intervene and advocate for the elimination of inequitable pain treatment based on racialized identity[39] (**Table 1**). However, despite significant efforts that led to the inclusion of pain disparities in national priorities,[34,40] researchers continue to identify greater pain severity, worse pain outcomes, and disparate treatment for minoritized groups.[24,65,70] The persistent nature of racialized disparities in pain experience underscores the need for critical action to address this equity-based impasse, particularly amidst the current sociopolitical urgency toward justice and social change for racialized groups.[7] As part of this effort, the present review contends that pain disparities are most appropriately conceptualized from an injustice perspective within a larger interacting systems framework. To date, research has focused on the injustice experiences of individuals. However, overlooking the systems that maintain and perpetuate injustice has limited our understanding of disparity mechanisms and slowed paths toward intervention.

In this article, we (1) provide a rationale for an injustice lens, (2) describe a model by which levels of injustice create and maintain pain disparities, (3) contextualize current knowledge of racialized pain disparities within this framework, and (4) discuss how this paradigmatic change shifts intervention priorities toward eliminating pain disparities. It is important to note that experiences with injustice are common and significant for most people with chronic pain[15,28,96]; these experiences are exacerbated for those exposed to multisystemic and intersectional injustice,[96,105] and the concepts proposed here should apply and be examined with respect to populations minoritized based on any aspect of their identity. However, to center the experiences of those most affected by injustice and disparate pain outcomes,[77] this review will highlight the racialized injustice experience of Black Americans to illustrate how multisystemic injustice disproportionately patterns pain burden across populations.

2. What we know about racialized disparities in pain outcomes

Previous empirical pain research clearly demonstrates racialized disparities across experimental,[53] clinical,[51,65] and treatment outcomes.[56,65,70] A 2017 meta-analysis of experimental findings among clinical and nonclinical samples indicated reduced pain tolerance and greater pain ratings among Black relative to White Americans.[53] Black Americans likewise endorse higher levels of pain-related cognitions such as threat or harm appraisal and catastrophizing.[31] Systematic reviews also expose significant disparities in pain assessment and treatment—across pain conditions, treatment settings, and subtypes (eg, acute and chronic as well as malignant and nonmalignant pain). Black Americans are more likely to have their pain underestimated[20] and receive inferior pain treatment[64] relative to White Americans. These disparities are not independent; unfair pain treatment directly results in more severe and unmanaged clinical pain.[3,39,65,72]

3. Relevance of injustice to health

Injustice is classically defined as a violation of equity or fairness[83] and has featured prominently as a fundamental cause in models of health disparities.[80] For example, in her ecosocial theory of disease distribution, Krieger explicitly describes health disparities as "biological expressions of injustice."[54] Braveman et al.[10] highlight the reciprocal relationship whereby societal injustices (eg, maintenance of intergenerational poverty through prejudicial laws and practices) cause health disparities and poor health compounds' social disadvantage—reproducing and entrenching disparities. Established models have outlined structural, social, psychological, and biological pathways by which the minoritized experience contributes to negative health outcomes and health disparities.[1,50,54,74,80,102] Critically, these models identify multiple hierarchical sources of injustice, including impacts at the cultural, structural, and interpersonal levels, that ultimately affect individual health outcomes.[102] However, this framework conceptualizing health disparities as the result and manifestation of multilevel injustice is not well reflected in contemporary approaches and assumptions about pain disparities. In pain research, there has been recent attention to the negative impact of pain-related injustice appraisals, which have been conceptualized as a set of

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Table 1

Definitions and rationale for key terms used in this article.

Commonly used term	Definition and implication	Term used in this article	Definition and implication	Rationale
Race	A sociopolitical construction that historically has been used to uphold racism—to systematically devalue and dehumanize groups of people by inaccurately implying innate or biological differences.[91]	Racialized	Highlights the systematic and historical process by which categories have been constructed and that these categories are part of a system rather than the individuals to which they are applied.[30]	To highlight that such categorizations are products of societal demarcation and processes of oppression and are not innate.
Minority	Often used to reflect people of lower power or status but implies inferiority or that a group has fewer numbers compared with a majority.[92]	Minoritized	Highlights the systematic process by which categories have been constructed while recognizing the innate equal humanity among people with minoritized identities.[14] This term also avoids the numerical inaccuracy of referring to minoritized groups who have a numerical majority in a population (eg, women) as having a minority status.[92]	To highlight that such categorizations are products of societal demarcation and processes of oppression and are not reflective of inferiority or population size.

This review includes both terms to distinguish between specific societal injustice faced by racialized groups and patterns of injustice faced by groups minoritized by other social identities or conditions more generally.

cognitions comprising attributions of blame and the magnitude and irreparability of loss.[18,19,68,93] Racialized disparities are also reflected in pain-related injustice.[96] However, it is important to distinguish these cognitions as individual-level processes, related but distinct from broader conceptualizations of injustice to which this review seeks to bring attention.

An injustice conceptualization of racialized pain disparities is timely and relevant for several reasons. First, it updates and aligns the conversation regarding pain disparities with broader health disparities research, which has decades of empirical support and centrally highlights the socioecological (hierarchical) nature of injustice domains and mechanisms that interact to contribute to individual outcomes.[10,54,102] This is a necessary conceptual shift for pain researchers because, to date, the focus has almost exclusively been on characterizing racialized disparities and examining the role of the individual, with some investigators occasionally assessing interpersonal cognitive–behavioral contributors to disparate pain outcomes.[32,76,82,88] Second, research has almost always centered responsibility for racialized pain disparities on minoritized individuals (eg, their perceptions and behaviors).[8,98] Conversely, a broader justice orientation shifts the focus away from the individual by contextualizing the multiple levels of injustice that can be targeted for intervention. Finally, a justice orientation centrally highlights the pressing ethical mandate toward greater equity, with corresponding recognition that collective action and policy change—not just individual-level change—is needed to achieve meaningful outcomes.[42,45,104]

4. Mechanisms of Injustice in Pain Outcomes: a heuristic model

Drawing on the socioecological model,[11,12] **Figure 1** presents a heuristic model of mutually interacting *cultural*, *structural*, and *interpersonal* injustice domains that influence *individual-level* (intrapersonal) processes and contribute to disparities pain outcomes, offering the architecture to investigate and target these factors. The model illustrates that multilevel external factors (eg, stereotypes and policies) create and maintain the racialized experience[49] and thus the pain outcomes of Black Americans. The model closely aligns with the syndemic theory[90] in acknowledging (1) the longstanding role of societal forces that have resulted in political, social, economic, and power inequities; (2) inequities shaping the distribution of risks and health resources; and (3) the multiple synergistic effects in which power inequities and biological, social, and economic processes overlap. Thus, pain disparities can be seen as culminating from systems of racialized oppression that shape pain trajectories through multiple dynamic pathways, with some pathways increasing the risk for inadequate pain outcomes.

4.1. Cultural injustice

Cultural injustice is sometimes referred to as "societal" or "systematic" and reflects inequities built into or stemming from ideology, values, language, imagery, symbols, and unstated assumptions.[21,29,87,102] Such values include narratives of colorblindness, individual responsibility, and meritocracy[9,55,78] and link to concepts such as just-world beliefs.[57] Cultural and other injustices interact to marginalize systematically oppressed members of society, including in the pain community. Evidence for the power of cultural ideology is reflected in findings of harsher social judgements associated with higher just-world beliefs[33] and greater interpersonal attributions of personal responsibility for pain among overweight women.[101] They are also reflected in erroneous (but strikingly persistent) medical beliefs that Black people do not "feel" as much physical pain.[48] Social psychological evidence that racialized implicit bias is culturally acquired (eg, through classical conditioning) implicates cultural injustice in even automatic processes of interpersonal injustice.[58,81] Cultural injustice is deeply rooted in the historical oppression that leveraged the dehumanization of Black Americans[29] but is also responsive to the current sociopolitical context. For instance, the Black Lives Matter movement and COVID-19 pandemic have raised broader cultural awareness of the prevalence and significant impact of racialized disparities and collective and individual efforts to spotlight and dismantle cultural injustice.[59] Despite its considerable influence, and recent calls for consideration of the critical impact of social context on pain mechanisms,[52,69,96,99] cultural injustice is perhaps the least discussed and assessed within

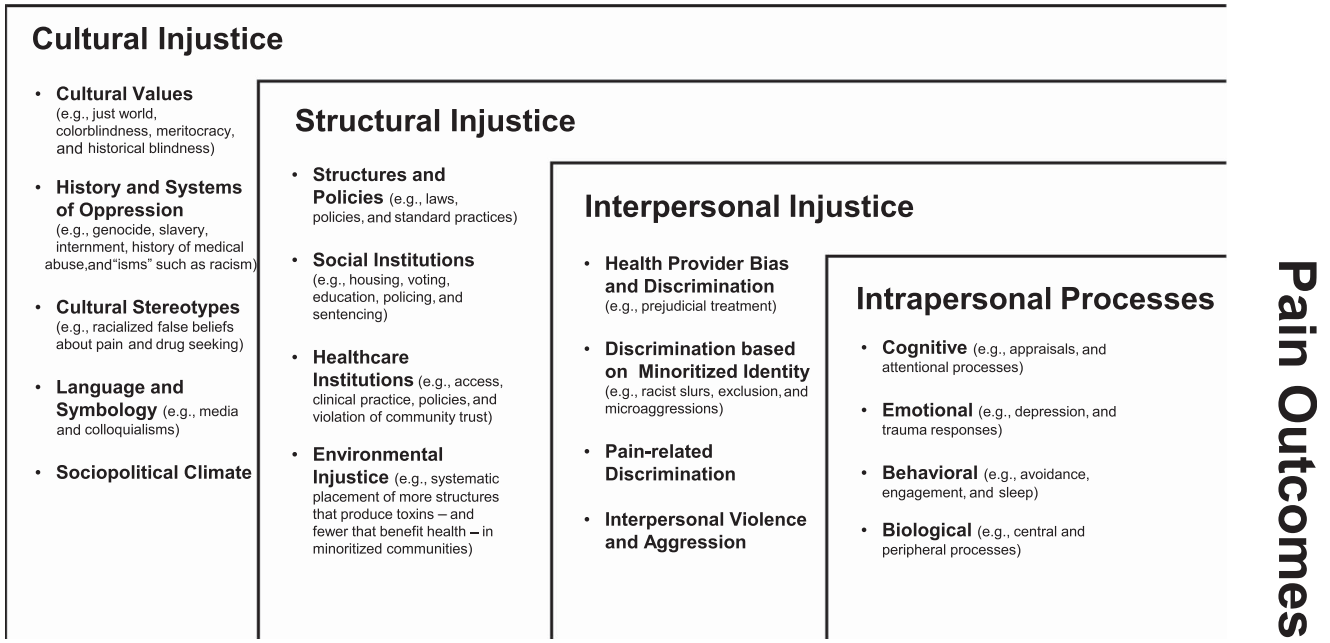

Figure 1. Mechanisms of injustice in pain outcomes. Multiple layers of injustice interact to impact pain processes within individuals and produce different trajectories of pain experience and outcomes. Experiences of injustice are common among people in pain, and this model is meant to be inclusive and applicable to all injustice experiences. Critically, compounding injustice across levels is systematically applied to minoritized groups—creating disparities in injustice exposure that create and maintain disparities in pain outcomes. In this conceptualization, observable disparities in pain outcomes or individual pain processes are the products of—and therefore cannot be disambiguated from—cultural, structural, and interpersonal injustice. This framework also highlights the need for multilevel interventions that target injustice to decrease the societal burden of pain and eliminate pain disparities.

pain research. Critically, socioecological and syndemic frameworks identify cultural injustice as *fundamental* rather than merely contributory to racialized disparities, thus mandating greater attention in our future empirical efforts.

4.2. Structural injustice

Structural injustice is sometimes described as "institutional" and includes inequities built into structures and systems such as government and healthcare organizations.[103] Prejudice in laws, policies, housing, voting, education, employment, policing, and judicial sentencing fall under this domain, as do structures or policies resulting in unequal healthcare access. Like culturally ingrained injustices, seemingly distal structural factors are likely to influence pain outcomes. For example, racialized residential segregation is a structural injustice with wide-ranging consequences for health and pain outcomes, potentially through association with increased risk of poorer quality employment, housing, and school opportunities; increased exposure to pollution and violence; and less availability of healthy food, transportation, recreation, and high-quality healthcare options.[86] Within minoritized communities, segregation leads to greater neighborhood risk (eg, concentrated poverty) and fewer neighborhood resilience (eg, safe walking paths) factors that have been linked to pain outcomes.[32,76,88] Structural injustices also affect several individual-level mechanisms that contribute to disparities. For example, residential segregation has implications for physiological dysregulation and inflammation[23,25,71,85] (ie, a biological individual-level process), which may worsen pain outcomes. Furthermore, persistent experiences of structural injustice can—through cognitive behavioral (eg, violated trust in medical and scientific institutions and avoidance behavior) and interpersonal (eg, worsened patient–doctor alliance) mechanisms—undermine individuals' effective access to systems of medical care and their inclusion in the benefits of pain management.[22,94] This assertion is supported by findings that, compared with White Americans, Black Americans view revenue generation rather than patient care as most central to healthcare institutions, resulting in lower institutional trust.[100]

4.3. Interpersonal injustice

Interpersonal injustice includes explicit and implicit discrimination and unfair treatment and has received relatively more—yet still limited—attention within pain research. Current research can be divided into 2 broad categories. First, research links interpersonal discrimination to enhanced pain and increased risk of chronic pain.[6,13,17,26–28,38,44,60,73] Although it can be argued that perception (and subsequent self-report) are individual-level processes, we place discrimination within the interpersonal domain in recognition of minoritized individuals as reliable reporters of their own interpersonal experiences. Second, research has identified bias in pain assessment and treatment recommendations, providing consistent evidence that provider appraisals are not independent of patients' racialized, socioeconomic, and sex identities.[2,46–48,61,67,75,97] Emerging research (albeit outside the field of pain) has identified specific provider bias–related behaviors which undermine patient interactions, such as reduced eye contact, specific word choices, and condescending tone and pitch.[41] Although such research is critical to effect change and has contributed to some improvements in care for minoritized groups, it is limited in volume and scope and has been largely divorced from consideration of cultural or structural injustice domains. Similarly, research focused exclusively on patient or provider perceptions does not account for their dynamic effects (eg, patient response to provider underassessment of pain). Thus,

although interpersonal justice implies a bidirectional relationship, most "interpersonal" scholarship has remained locked into an examination of individual-level perspectives.[79]

4.4. Individual (intrapersonal) processes

Most pain disparities research has focused on characterizing individual-level variables. Our proposed heuristic model acknowledges that pain is ultimately experienced and expressed by individuals and perhaps most proximally affected by traditionally distinguished cognitive, emotional, behavioral, and biological pain–related processes. Research in this area has identified connections between pain disparities and disparities in sleep, depression, pain catastrophizing, activity avoidance, epigenetic processes, and vitamin D deficiency—although, notably, all associated with interpersonal discrimination.[4,16,62,63,84,95] Even individual-level injustice appraisals are reinforced through repeated experience and arise in response to environmental and social factors (eg, prior experiences of interpersonal discrimination are associated with greater levels of pain-related injustice appraisals[105]). Although research on proximal predictors is essential, we argue that, without appropriate contextualization within broader cultural, structural, and interpersonal systems of injustice, a singular focus on intrapersonal processes in pain outcomes impedes empirical progress and meaningful change by inappropriately centering the source of racialized disparities within the individual in pain. This focus on the individual implicitly places the blame and responsibility for change on the very people who are experiencing systemic oppression and greater pain burden[8,98] and is upheld by deeply embedded cultural ideologies (eg, meritocracy and just-world beliefs[9]). Ultimately, empirical blindness to larger structures of injustice serves to reinforce these inequitable systems. As Volpe et al.[98] have argued, "ahistorical, acontextual, risk-based, and individual approaches" have led to interventions focused on individual stress and coping and, most importantly, have not led to amelioration of health disparities.

5. Considering injustice in pain interventions

Current pain interventions almost exclusively target individual-level processes, limiting conceptualization of pain disparities and ultimately leaving the status quo of profound disparities intact. By contrast, a justice orientation calls for interventions at multiple levels of injustice—rather than those that simply buffer individual-level effects (eg, through interventions targeting coping)—to eliminate disparities.[104] In this way, the heuristic model may help identify novel and multilevel targets for pain intervention studies and clinical trials.

Fundamentally, there needs to be recognition that Black Americans in pain are situated within a milieu of cultural, structural, and interpersonal injustice. Without acknowledging the broader context, the risk of building a biased and, possibly invalid, body of research based on individual-level processes increases. Understanding the influence of injustice on pain outcomes in intervention trials will require increased inclusion of Black Americans—not only as participants but also in the development, implementation, and evaluation of pain interventions to ensure generalizability and cultural relevance. Strength-based approaches, community-level interventions, and collaborative community efforts focused on capacity building, and coalition building also work to restore power to oppressed communities.[42]

Interventions targeting the dehumanizing stereotypes (eg, explicit beliefs that Black Americans are "drug seeking" and experience less pain) that contribute to cultural injustice in pain may include elevation of counternarratives in training and medical practice as well as in public discourse.[42] Within the field of sickle cell research, where pejorative terms such as "sicklers" are still used,[35,37] telementoring and knowledge-sharing networks along with emergency department programs have recently emerged as interventions to address injustice at structural and interpersonal levels.[36,89]

Addressing higher level injustices will also require an expansion of our ideas of pain interventions. A recent study found that food insecurity was a more powerful predictor of chronic pain severity than other well-established health indicators,[66] suggesting food insecurity as a target for intervention (eg, provision of food supplements) to decrease pain. This type of intervention—addressing basic needs and considering systemic and policy-level targets—has yet to be examined by pain researchers. There is a critical need for future research and training in this area. Although recent funding mechanisms for structural indicators of health (eg, NIH UNITE initiative to address structural racism) represent a step in the right direction, to honestly address pain disparities, institutional reform working within quality improvement models, collective impact, community engagement, and community mobilization are needed.[5]

6. Conclusion

Regardless of intent, deeply entrenched injustice has served to provide or defend the advantages of White Americans by disadvantaging Black Americans. The focus on individual-level phenomena has deterred inquiry into pervasive multilevel injustice that affects the lives and bodies of individuals from minoritized groups. Patterns of injustice are closely tied to and uniquely contribute to pain. Contemporary beliefs that Black Americans have diminished capacity for pain echo racist narratives used to justify the historical brutality and infliction of pain on Black bodies.[48] The dismissal and devaluing of the pain of minoritized groups functions to deny their humanity and reinforce structural hierarchies of power and oppression.[43] This dehumanization, in turn, creates an environment where the specific conditions that increase pain risk are excused and maintained, and interpersonal discrimination in pain treatment is permitted. Pain disparities are evidence of pervasive multilevel injustices that are systematically applied to minoritized individuals, increasing the probability of worse pain outcomes. Centering research and discussions about pain disparities within an injustice perspective illuminates the need for collective action to actualize justice—to be intolerant of and oppose cultural beliefs that perpetuate injustice in pain treatment, to work for societal change to end structural injustice, and to eliminate disparities in pain.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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