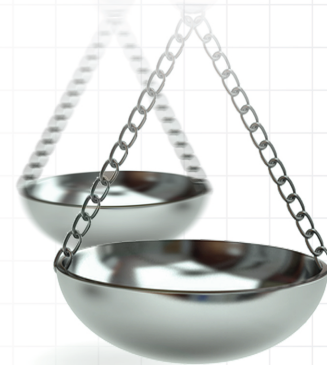




The economic cost of racial disparities in chronic pain

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The cost of chronic pain produces a large financial burden on the healthcare system, further exacerbated by social disparities within the diagnosis and treatment of chronic pain conditions. However, by analyzing and rationalizing the cost of those disparities, further studies and resources can aim to reduce them. Here, we review the literature to estimate the costs associated with modifiable inequalities in chronic pain such as the multimodal undertreatment of pain for minority populations and access to comprehensive chronic pain management. These estimates further point to social disparities as a major driver of financial burden in the healthcare system.

The economic cost of pain in the USA is estimated between US\$560 billion and US\$635 billion annually [1]. According to the NIH, the cost of chronic pain exceeds some of the major diagnoses associated with the highest morbidity and mortality: cardiovascular diseases (US\$309 billion), malignancies (US\$243 billion) and injuries (US\$205 billion) [2]. The factors accounting for this cost are the incremental costs of healthcare due to pain and the indirect costs due to lower productivity associated with lost work days and hours and lower wages [1]. While the cost of chronic pain creates a large financial burden on the healthcare system, social disparities as a subset of that cost may represent an opportunity for improvement both from a social justice perspective and a financial one. The National Academy of Medicine defines disparities as racial and or ethnic differences in the quality of healthcare that is not secondary to access, preference and appropriate intervention, and the NAM has delineated pain management as an area of disparity [3]. Medical expenditures secondary to racial inequalities alone were estimated to be US\$229 billion, and indirect costs from lost productivity was calculated to be US\$1 trillion [4]. Thus, social disparities may exacerbate the cost of chronic pain and lead to excess financial burden. However, if we can increase our understanding of the sources of inequality inherent to chronic pain, we may become better equipped at reducing the associated costs.

Cost of differential treatment of chronic pain

Differences in the treatment of pain among patients based on race has been demonstrated across the literature. In the emergency department, white patients presenting with a migraine, back pain or abdominal pain were more likely to receive narcotic medication compared with their black counterparts [5–7]. Sickle cell disease patients experienced 50% longer wait times at the emergency department, and this delay has been shown to be independently associated with race and with a sickle cell disease diagnosis [8]. In the primary care setting, black patients reporting moderate to high intensity of low back, neck or joint pain were less likely to receive opioid prescriptions [9]. Black Medicare beneficiaries with noncancer pain visiting specialty providers reported 10% less opioid dispensing than white patients, despite black beneficiaries also being less likely to fill opioid prescriptions [10]. These studies suggest undertreatment of pain in racial minorities in several healthcare settings, and this undertreatment may translate to increased medical expenditures for health systems.

Gaskin and Richard's cost analysis estimated that adults with moderate pain had expenditures US\$4516 higher than that of someone without pain, and those with severe pain reported expenditures US\$3210 greater than someone with moderate pain [1]. Analysis of National Health Institute survey of patients with diagnosed arthritis showed that black patients had a higher prevalence of severe pain compared with white patients (34 vs 22.6%) and that a higher proportion of Hispanic patients experienced more severe pain compared with white patients (32.5 vs 22.6%) [11]. Exploration of generalized chronic pain severity in the aging (greater than 51 years old) population revealed 27% of black and Hispanic patients reported severe pain while 17% of their white counterparts had severe pain [12]. Thus, the differential between the two populations is 10%, and the cost of this racial disparity approximates to an additional US\$3210 per minority patient with severe pain for ten white patients with severe pain. In addition, perceived racial discrimination has been associated with a greater level of body pain through chronic stress, indicating that differential treatment at an individual to systems level may itself exacerbate pain severity, which results in more minority patients manifesting severe versus moderate or mild pain [13].

Cost of inadequate access to pain specialists

Chronic pain is best managed in the primary care environment using a chronic disease model [14]. However, inadequate access to chronic pain care presents a barrier for minorities in receiving early and consistent management. Hispanics are significantly less likely to have consulted a primary care physician for pain compared with other ethnic groups (70 vs 84%) [15]. Furthermore, back pain clinic visits for Hispanics patients lasted 1.6 min less than non-Hispanic whites, and they were more likely to present for new back pain instead of follow-up for back pain [16].

Without proper access to outpatient pain management, patients may alternatively seek relief from urgent or emergent care settings. Data from a Baltimore emergency department suggest most of its chronic pain patients have never been seen at a pain clinic [17]. One fiscal analysis of emergency admissions for chronic pain back during a 12-month period demonstrated 74% of emergency visits for acute exacerbation of chronic back pain were associated with CPT codes ranging from US\$399 to US\$1943. Among these patients, 30% represented multiple visits in the 12-month timeline, suggesting these patients had no or inadequate outpatient chronic pain management [18]. Considering the excess costs associated with imaging or other tests, emergency departments are a costly alternative to outpatient appointments for the management of chronic pain. In addition, black patients with primary low back pain were more likely to visit the emergency room for acute pain and to be admitted to the hospital [19]. As minorities are unable to obtain proper outpatient care for their pain, they may be turning to interventions at emergency settings, resulting in a higher incremental cost for their healthcare. Blacks and non-white Hispanics were 14% more likely to seek emergency services for ambulatory care conditions, and charges in the emergency department were 320–728% than those in primary care clinic, allowing for decreased cost when treatment is performed in an outpatient setting [20].

Costs of loss in productivity

Furthermore, inadequate chronic pain treatment in minority populations likely results in lost productivity, contributing to the economic cost of disparities in pain. Literature review indicates chronic pain is associated with reports of greater pain-related physical disability among blacks than non-Hispanic whites [21]. Gaskin and Richard's statistical study on indirect costs of pain reports persons with a functional disability had the largest impact on hourly wages (reduction of US\$9.36 per hour), and the total indirect cost from functional disability is US\$192 billion [1]. Analysis of acute back injuries and missed work days showed that racial and ethnic minorities were about twice as likely as whites to be disabled at 6 months [22].

Black patients with common pain conditions exhibited 2 h per week of pain-related lost productive time in work compared with their white counterpart [23]. Compared with persons with no pain, adults with moderate pain worked 291 fewer hours and adults with severe pain worked 717 fewer hours. Considering the average hourly wage was US\$14.19 from the 2010 Consumer Price Index, the annual indirect costs for fewer hours worked ranged from US\$95 billion to US\$96 billion. Furthermore, adults with pain reported missing more full days (2.1–2.6 days) of work than those without pain [1]. As black patients contribute a significant portion of the indirect costs related to chronic pain, addressing the need for improvement in pain treatment in racial minorities can prevent billions of dollars in productivity loss.

Conclusion

Here, we present racial disparities in chronic pain management as a major source of financial burden to the healthcare system and society, at large. The estimated cost of pain is likely due to an interplay of multiple, complex factors. However, by identifying several modifiable disparities that are estimated to create excess expenditure, there exists future opportunities to better study those factors and eventually develop interventions that could save billions of dollars. Current literature analyzing the quantifiable cost of racial discrepancies in the chronic pain realm is limited, but we hope our discussion sparks further exploration in the hidden economic burden created by the social inequalities in healthcare.

Author contributions

J Lee conducted the literature review and writing of the manuscript. R Jotwani conducted the literature review and writing of the manuscript. R White reviewed and edited the manuscript, providing guidance at all stages.

Financial & competing interests disclosure

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