



Short Communication

Disentangling factors contributing to individual differences and health disparities in chronic pain and whole person health with measures of allostatic load

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Our publication in BBIH (Mickle et al., 2023) compared two measures of allostatic load, a clinical composite and brain structures, and evaluated whether the clinical composite would align with previously reported bilateral temporal lobe structural findings in adults with chronic pain with/at risk for knee osteoarthritis (Tanner et al., 2021). Our prior research indicated that in individuals with high chronic pain severity, non-Hispanic Black adults with greater socioenvironmental risk factors had thinner temporal lobes compared to non-Hispanic White adults with fewer socioenvironmental risk factors, key regions of the brain associated with risk for dementia (Tanner et al., 2021). As reported in the BBIH publication, the relationships observed between the sociodemographic groups and chronic pain stage in the bilateral temporal lobes were replicated in the clinical composite measure (in Mickle et al., 2023, Figure 2).

Adding to our prior findings, we complete a follow-up analysis, in the same study sample ($n = 119$), with a measure of socioenvironmental risk replacing sociodemographic group. Initially modeled from a population-based study (Rethorn et al., 2022), socioenvironmental risk was determined by an additive measure including: education, poverty, employment status, medical insurance status, marital status, and Area Deprivation Index (ADI) (Antoine et al., 2023). Each variable was assigned a 0 for protective or 1 for risk. Risk was based on clinical norms and then summed with a score range of 0–6. Consistent with our prior

study, socioenvironmental risk was classified as low risk = 0–2 and high risk = 3–6 (Antoine et al., 2023). Chronic pain stage was also categorized as low = 1–2 and high = 4–5. The allostatic load clinical composite ranged from 0 to 10 as previously described (Mickle et al., 2023). Linear regression analyses were completed with age and study site 1 = UF, 2 = UAB as additional predictors and sociodemographic group as a secondary additional predictor.

Sociodemographic group was not a significant predictor in the model, nor was the overall model significant ($p \geq 0.10$). However, a cumulative load pattern of higher socioenvironmental risk higher chronic pain stage, and higher allostatic load, Fig. 1. In our previous publication with the same variables, investigating socioenvironmental risk and chronic pain stage in the bilateral temporal lobe areas of the brain, a significant dose response was indicated (Antoine et al., 2023). Limitations in the current analysis include the range of the clinical composite measure (0–10) and the composite score is relative to the study sample. Incorporating a broader clinical composite range and basing the composite measure on clinically derived values would be beneficial next steps in future investigations.

Combining across the studies (Mickle et al., 2023; Tanner et al., 2021; Antoine et al., 2023), findings reveal: 1) that socioenvironmental factors in addition to chronic pain contribute to the differences observed in pain-related health outcomes, 2) a more vulnerable, chronic pain

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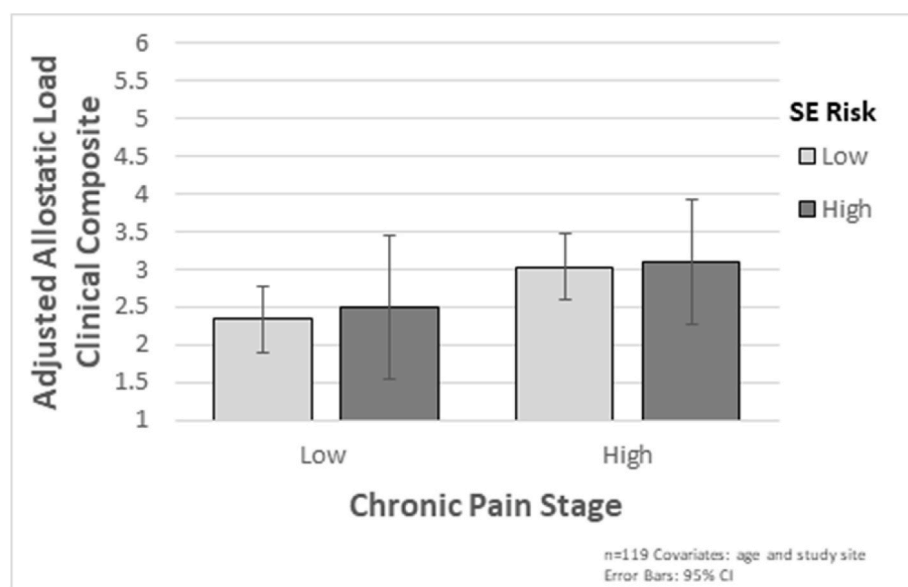


Fig. 1. Low and high socioenvironmental risk and chronic pain stage groups and the allostatic load clinical composite.

subgroup, at risk for poor health outcomes, is identifiable, 3) the allostatic load clinical composite measure might serve as a clinical tool aligning with previously reported findings in the bilateral temporal lobes; 4) an additive measure of socioenvironmental risks helps to disentangle the factors contributing to disparities in health outcomes, and 5) the cumulative burden of greater socioenvironmental risk and high chronic pain severity associate with higher allostatic load and lower whole person individual health status.

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Declaration of competing interest

The authors report no competing interests.

Data availability

Data will be made available on request.

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