Pain Site Count on the CHOIR Body Map as a Marker of Psychological Distress in Adults with Chronic Pain

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Significance

- Chronic pain affects **~20% of U.S. adults**, yet clinical assessments rely extensively on pain intensity alone.
- **Pain distribution**, **the spatial extent of pain across the body**, may reflect broader biopsychosocial burden including psychological distress and functional impairment **beyond what intensity alone conveys.**
- The CHOIR Body Map provides a validated, standardized tool for quantifying pain distributions as pain site counts.

Method

- **Study Type:**
  Cross-sectional secondary analysis of a national self-report survey
- **Participants:**
  1505 U.S. adults with chronic pain recruited by CloudResearch Connect
- **Operationalization: (all outcomes reported as T-scores)**

Pain Distribution	Site Count on the 74-Segment CHOIR Body Map
Pain Interference	PROMIS Bank v1.1 - Pain Interference
Depression	PROMIS Bank v1.0 - Depression
Anxiety	PROMIS Bank v1.0 - Anxiety

- **Analysis: Hierarchical linear regression**
  Covariates (age, sex, race/ethnicity, education, and pain intensity) were entered in step 1; pain site count was entered in step 2. The primary test of interest was the incremental variance (ΔR^2) explained by pain site count beyond these controls.

Conclusion

- **Pain Interference: Primary Outcome.** An additional 3.6% of variance accounted for by pain site count beyond pain intensity and other demographic factors. For every 1 standard deviation increase in pain site count, pain interference increases by 0.20 standard deviations.($p < .001$)
- **Depression: Primary Outcome.** An additional 1% variance accounted for by pain site count beyond pain intensity and other demographic factors. For every 1 standard deviation increase in pain site count, pain interference increases by 0.11 standard deviations. ($p < .001$)
- **Anxiety: Secondary Outcome.** An additional 0.9% of variance accounted for by pain site count beyond pain intensity and other demographic factors. For every 1 standard deviation increase in pain site count, pain interference increases by 0.10 standard deviations. ($p < .001$)

These findings support pain distribution as a clinically meaningful indicator of biopsychosocial burden and it should be assessed alongside pain intensity in clinical and research settings.

Implications

- Using existing body maps including CHOIR Body Map, future research could focus on implementation of pain site count as an additional assessment criteria for chronic pain patients on top of pain intensity.
- Building on significant results from future research, pain site count could be incorporated into body maps beyond CHOIR and play a supplementary role in routine pain assessment.

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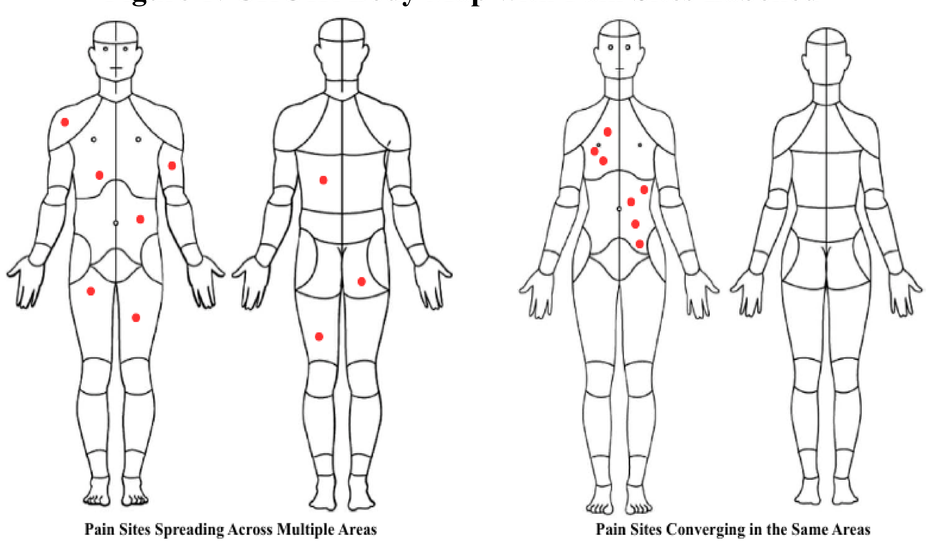
Objective

- Examine whether pain distribution is independently associated with psychological distress beyond intensity and sociodemographics.

Table 1: Sample Characteristics

Variable	Total(N=1,505)
Age, Years(mean[SD])	41.9(13.4)
Sex	66.5% Female
Race/ethnicity	
White	66.9%
Black	10.4%
Hispanic	4.7%
Asian	3.2%
Multiracial	13.7%
Other	1.1%
Education	82.9% bachelor's degree or higher
Pain Intensity(M=61.6, SD=5.8)	**Pain Site Count(M=13.6, SD=11.5)**

Figure 1: CHOIR Body Map with Pain Sites Labelled



Results

Figure 2: Standardized Beta for Pain Site Count

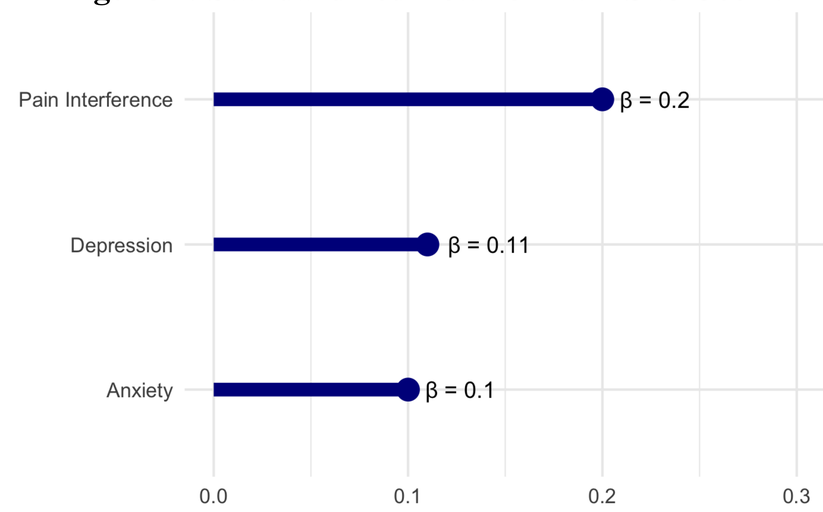


Figure 3: Incremental Variance Explained Across Outcomes

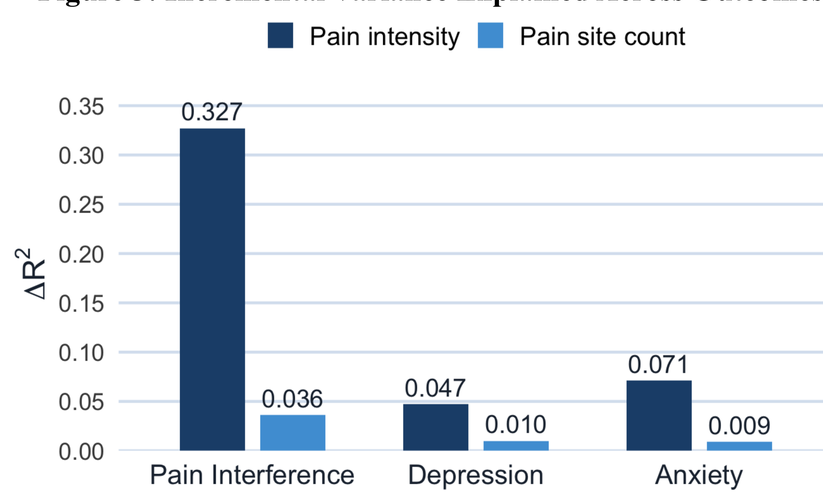
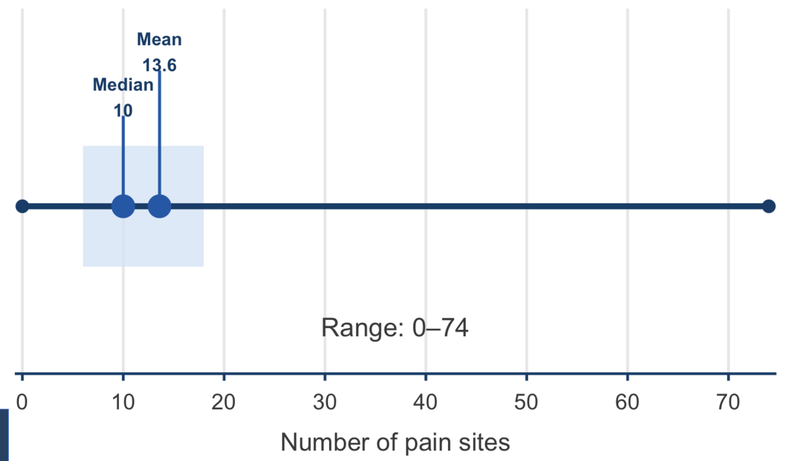


Figure 4: Pain Site Count Summary



Limitations

- **Self-report Measures**
  Data collected rely primarily on self-report measurements, which are subject to self-report bias. Also, since they are collected at a particular time point, it's hard to determine the temporal stability of these associations.
- **Limitation in Operationalization**
  Pain extent is operationalized as site count, which reflects the breadth of pain involvement but does not capture the spatial topology of pain. For instance, a patient endorsing many clustered sites in one region would receive the same score as one with equivalently dispersed sites across the body.
- **Biased Sample with Higher Education Rate**
  82.9% of the sample recruited has a bachelor's degree or higher education, which is more educated than the general U.S population, which has a base rate of 35.7% to 44.5% individuals with bachelor's degree or higher education.
- **Secondary Analysis of a Correlational Study**
  Since all the data is based on secondary analysis of a correlational study, we cannot establish causality. There might be other variables influencing the whole process.

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