

# Social Determinants of Physical and Mental Health Among Women ≥45 Years With Chronic Pain and Cognitive Impairment Using the All of Us Research Program

Martina Nemia, Baraan Vassighi, Dr. Yijiong Yang, PhD, Dr. Setor Kofi Sorkpor, PhD, MPH, MSN, RN  
College of Nursing, Florida State University

## Introduction

- Chronic pain and cognitive impairment frequently co-occur in older adults and are often managed with prescription opioids [1,2]
- However, evidence on how health outcomes vary across demographic and socioeconomic subgroups of women with chronic pain and cognitive impairment remains limited.
- Understanding these patterns is important for informing equitable pain management strategies in aging populations.
- This study examined demographic and socioeconomic factors associated with self-reported physical and mental health among women aged ≥45 years with chronic pain and cognitive impairment.

## Methods

- Study design:** Cross-sectional study using electronic health records and survey data from the All of Us Research Program [3]
- Sample:** Insured U.S. women aged 45–64 years (n = 644) and ≥65 years (n = 1,841) with documented cognitive impairment or dementia, chronic pain, opioid exposure or related conditions, and completion of the PROMIS Global Health-10 questionnaire.
- Outcomes:** PROMIS physical and mental health T-scores [4]
- Analysis:** Descriptive statistics summarized demographic and socioeconomic characteristics. Generalized linear regression models were used to examine associations between age group, race, education, employment status, income, and self-reported health outcomes.

## Results

- Women aged ≥65 years had higher physical health ( $\beta = 1.01$ , 95% CI: 0.15–1.87) and mental health scores ( $\beta = 1.45$ , 95% CI: 0.55–2.34) compared with women aged 45–64 years.
- Higher educational attainment was associated with better physical and mental health scores.
- Unemployment and inability to work were strongly associated with poorer physical and mental health outcomes.
- Higher income was associated with better physical and mental health scores.
- Marital status was associated with mental health, with married women reporting slightly lower mental health scores than unmarried women.

## Results

### Factors Associated with PROMIS Global-10 Physical and Mental Health Scores (Women ≥45 Years)

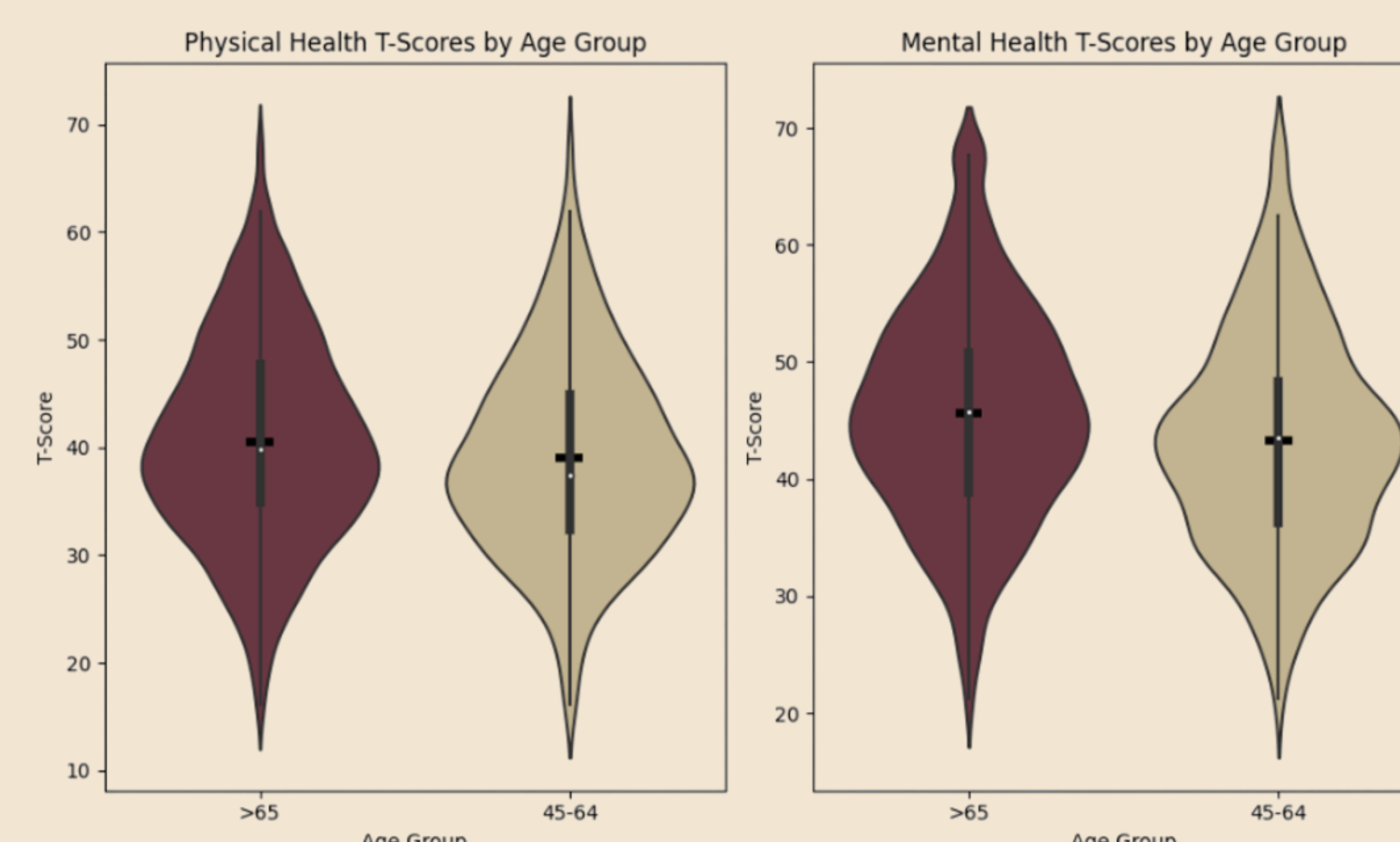
Variable	Category	Physical Health $\beta$ (95% CI)	Mental Health $\beta$ (95% CI)
Age Group	≥65 vs 45–64	1.01 (0.15, 1.87)	1.45 (0.55, 2.34)
Race	Other vs White	-1.64 (-3.06, -0.23)	–
Education	College vs ≤HS	0.98 (0.17, 1.80)	0.99 (0.14, 1.83)
	Advanced Degree vs ≤HS	2.81 (1.63, 3.99)	1.47 (0.29, 2.66)
Employment	Homemaker/Student vs Employed	-2.50 (-3.52, -1.48)	-1.10 (-2.17, -0.03)
	Not Employed vs Employed	-7.00 (-8.06, -5.93)	-6.03 (-7.17, -4.89)
	Retired vs Employed	-3.67 (-4.90, -2.43)	-3.71 (-5.03, -2.39)
Income	Unable to Work vs Employed	-4.78 (-7.43, -2.13)	-2.71 (-5.02, -0.39)
	\$35k–\$75k vs ≤\$35k	2.45 (1.35, 3.56)	1.90 (0.84, 2.96)
	\$75k–\$150k vs ≤\$35k	3.95 (2.57, 5.33)	4.02 (2.61, 5.43)
	>\$150k vs ≤\$35k	–	1.18 (0.33, 2.03)
Marital Status	Married vs Not Married	–	-1.44 (-2.21, -0.68)

**Note:** Values shown are statistically significant associations ( $p < 0.05$ ).  $\beta$  = regression coefficient from generalized linear regression.

### Key Findings:

Among adults aged ≥45 years with chronic pain and cognitive impairment, higher education and income were associated with better physical and mental health, while unemployment and inability to work were strongly associated with poorer health outcomes.

### PROMIS Global Health T-Scores by Age Group



**Distribution of PROMIS Global-10 physical and mental health T-scores among women aged 45–64 and ≥65. Older women demonstrated slightly higher median scores for both physical and mental health.**

## Demographics

Sample Characteristics (N = 2,503)

- 74% aged ≥65 years
- 57% White; 17% Black or African American
- 7% Hispanic ethnicity
- 66% had a college degree or higher
- 45% were retired
- 42% reported income ≤\$35,000
- 84% were U.S.-born

## Discussion

- Socioeconomic factors were strongly associated with PROMIS physical and mental health scores among adults aged ≥45 years with chronic pain and cognitive impairment.
- Employment status showed the largest associations, with individuals who were not employed or unable to work reporting substantially lower physical and mental health scores.
- Higher income demonstrated a consistent positive gradient across both health domains, while higher educational attainment was associated with better self-reported health outcomes.
- These findings are consistent with prior research demonstrating that social and economic conditions play a major role in shaping health outcomes among individuals with chronic illness.

## Conclusion

- Socioeconomic position, particularly education, employment status, and income, was strongly associated with self-reported health among adults ≥45 years with chronic pain and cognitive impairment.
- Addressing social determinants of health may help improve equitable pain management and health outcomes in aging populations.

## References

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