

Differential Item Functioning of Pain and Pain Interference by Health Literacy

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Background

- Health literacy is fundamental to individuals' capacity to access, grasp, and effectively utilize health information and services to inform decisions about their well-being
- Low health literacy is associated with adverse outcomes, including worse health and increased mortality. Approximately 75 million U.S. adults have low health literacy, posing challenges for healthcare adherence and research participation
- Understanding the connection between health literacy and pain reporting is essential for improving pain management and healthcare outcomes

Research Objectives

- Our primary aim was to assess and compare pain reporting differences, particularly in pain intensity and pain interference, between individuals exhibiting low health literacy and those demonstrating adequate health literacy
 - We used the PROMIS-29 instrument for measurement

Methods

- 725 participants were recruited from Boston Medical Center (BMC) and Northwestern University (NU) patient repositories, and using community outreach methods
- Participants were randomized into either two study groups (paper-and-pencil questionnaires vs. a computerized talking touchscreen interface) and completed performance-based tests of health literacy during 3 in-person visits (baseline, 3-month follow-up, 6-month follow-up)
- Both groups completed the PROMIS-29 scale and the Health Literacy Assessment Using Talking Touchscreen Technology (Health LiTT), among others. We compared participants with adequate health literacy (Health LiTT T-Score ≥ 55) to participants with low health literacy (Health LiTT T-Score < 55)

Results

- Participant demographics: 18 to 85 years ($M_{age} = 49.5$, 61.8% female)
- Participants with low health literacy reported higher average pain intensity and pain interference
- Adequate health literacy group more frequently responded as "not at all" to PROMIS-29 items assessing pain interference
- Confirmatory factor analysis (CFA) indicated that item slopes within the PROMIS-29 pain sub-scales did not significantly differ between groups
 - This suggests that participants, regardless of their health literacy level, consistently interpreted and responded to the questionnaires

Figure 1. Scatterplot matrix: Health literacy and pain

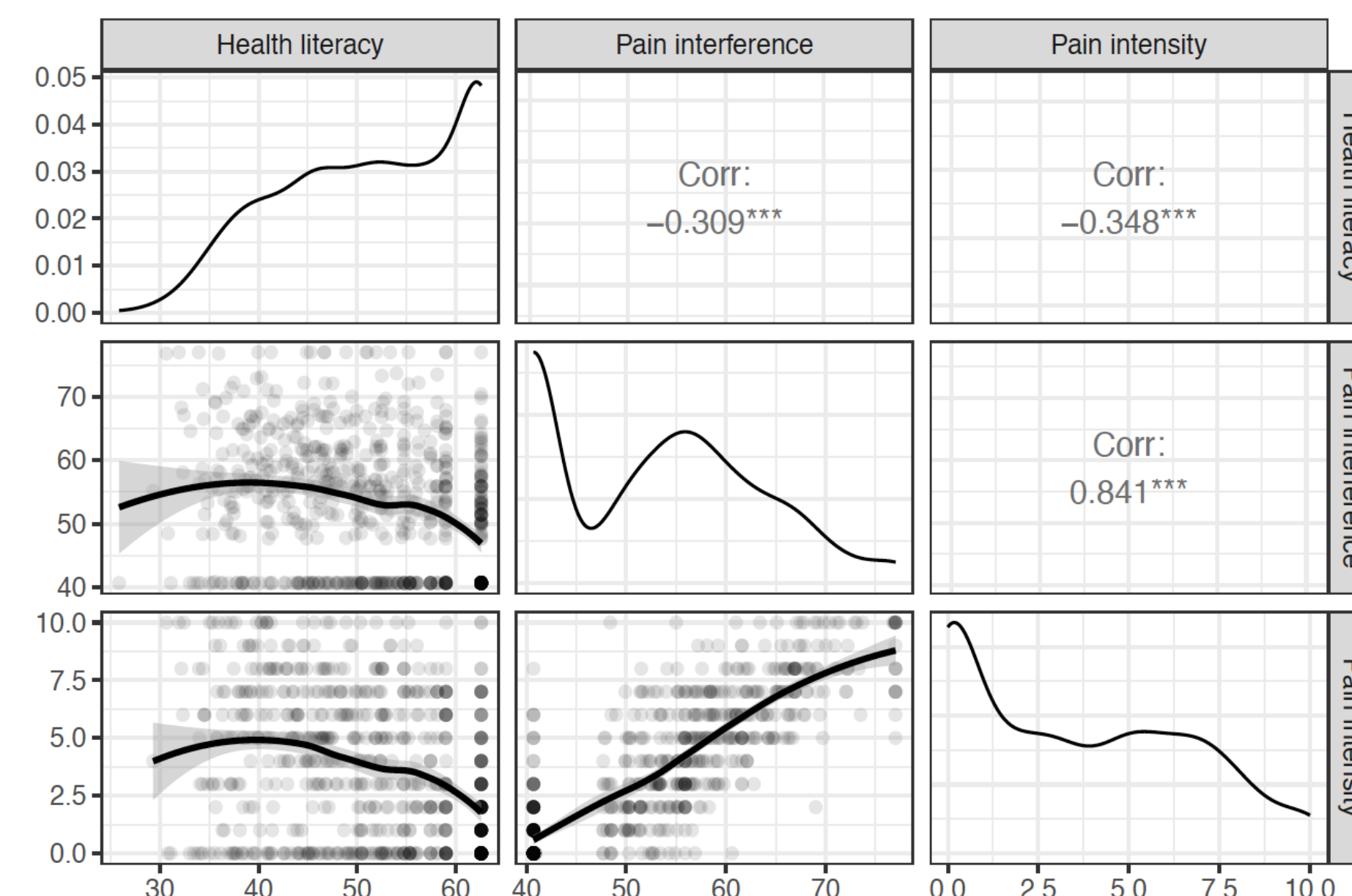


Figure 1. Scatterplot matrix showing relationships between health literacy, pain intensity, and pain interference. As health literacy increases, both pain interference and pain intensity decrease. Additionally, pain intensity and pain interference had a strong positive correlation

Figure 2. Item frequencies by health literacy

Figure 2. Frequency of responses to each item of the PROMIS pain interference scale, with participants grouped by health literacy

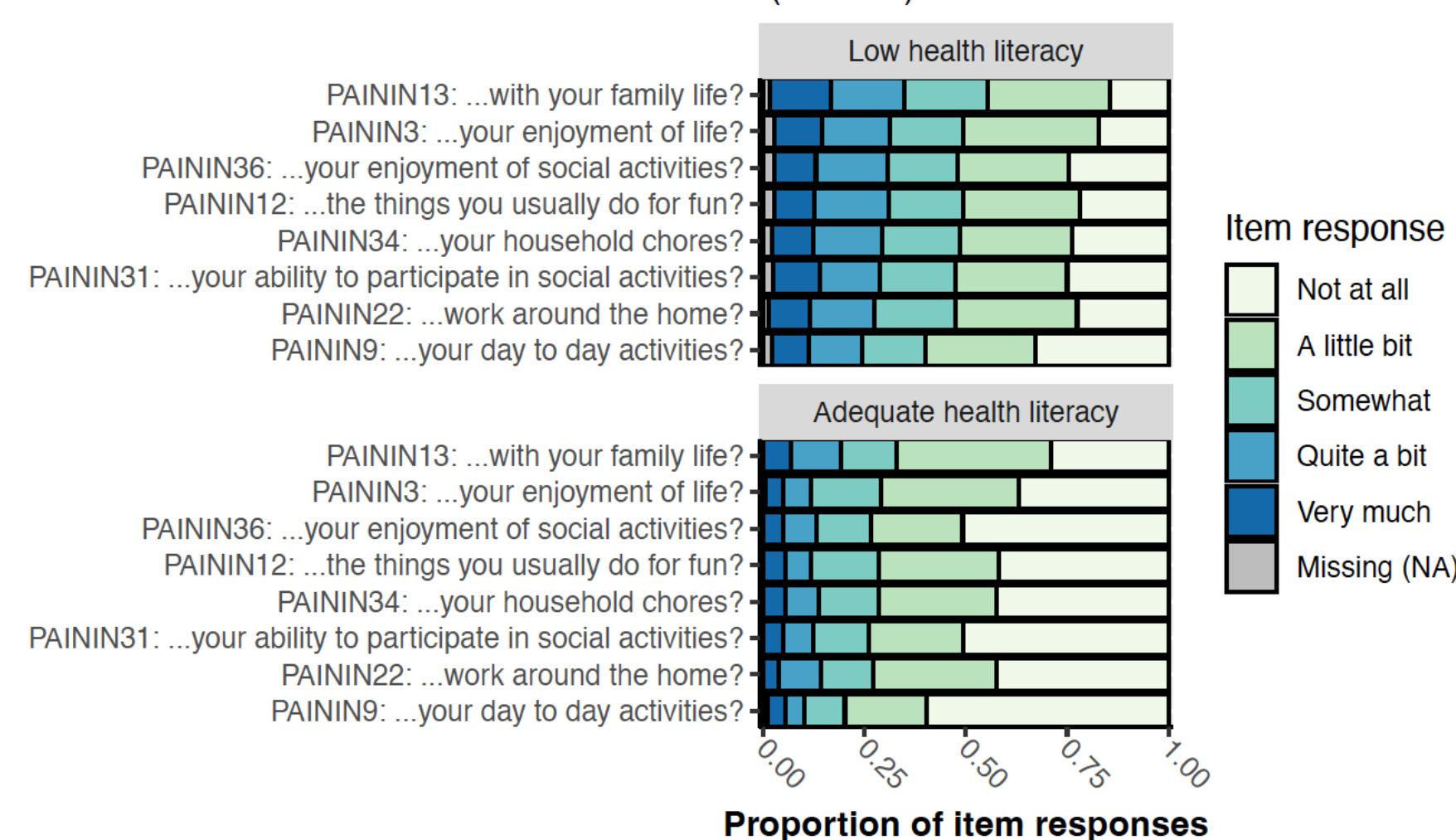


Figure 4: Pain interference items
How much did pain interfere with...
Participants with pain intensity > 0
(N = 513)

Figure 3. Standardized item slopes

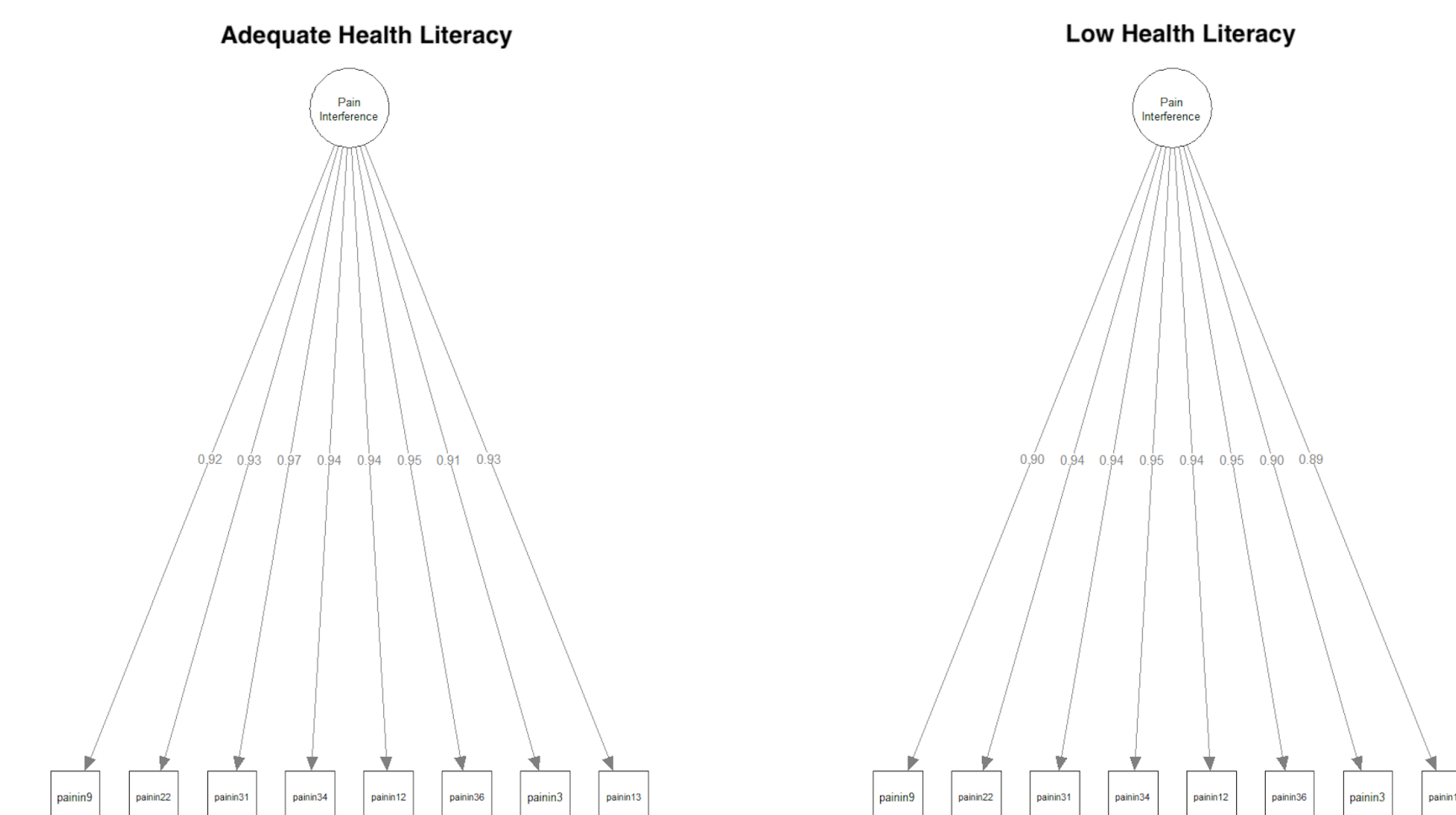


Figure 3. Standardized item slopes of the adequate health literacy group and the low health literacy group

Conclusions

- Low health literacy was associated with higher average pain intensity and pain interference
- Regardless of health literacy level, participants consistently interpreted and responded to the PROMIS-29 questionnaire items
- Findings suggest that the PROMIS-29 pain sub-scales are appropriate for assessing pain outcomes in diverse populations, irrespective of health literacy levels

References

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Acknowledgements

We would like to extend our sincere appreciation to all the participants who contributed their time and effort to this study. We are also grateful to the National Institutes of Health and the National Institute on Minority Health and Health Disparities for their financial support, which made this research possible. And a special thank you to our dedicated research team whose unwavering commitment was instrumental in ensuring the successful completion of this project.