

Pain Self-Efficacy Moderates the Relationship between Pain Catastrophizing, Depression, and Quality of Life in Adults with Chronic Pain

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BACKGROUND

- Adults with chronic pain have significantly lower quality of life (QOL) and are often a standard deviation below the mean score of the general population^{1,2}.
- Newly referred patients to the Kingston Health Sciences Centre, Chronic Pain Clinic (KHSC-CPC) are 2 standard deviations below the general population in terms of mental QOL.
- Thus, QOL is a key target for pain treatments.

OBJECTIVE

Examine adults with chronic pain after a year of specialized treatment to determine the role of pain catastrophizing, depression, and pain self-efficacy in predicting changes in mental QOL.

METHODS

DESIGN

- This prospective cohort study assessed questionnaires completed as standard of care by patients (N=251) in the KHSC-CPC from November 2017 to May 2021.
- Inclusion criteria:** 1) Adults (18+) with chronic pain; 2) An initial appointment and one-year appointment completed at the KHSC-CPC.

PROCEDURES

- Questionnaires consisting of health- and pain-related measures were collected at participants' initial (baseline) and one-year (follow-up) appointments.
- Change scores on the QOL, depression, and pain self-efficacy measures were obtained by subtracting participants' scores at follow-up by those at baseline. Only baseline scores were used to assess pain catastrophizing.

MEASURES

- Pain catastrophizing** was measured using the Pain Catastrophizing Scale Short Form (PCS-6). Higher scores indicated increased (worse) pain catastrophizing.
- QOL** was measured using the Short Form-12 Health Survey (SF-12). Higher scores indicated improved QOL.
- Depression** was measured using the Patient Health Questionnaire (PHQ-9). Higher scores indicated increased (more severe) depression.
- Pain self-efficacy** was measured using the Short Form of the Pain Self-Efficacy Scale (PSEQ-2). Higher scores indicated improved pain self-efficacy.

STATISTICAL ANALYSIS

- Analyses were performed using the lavaan package in R.
- Only participants with ≥80% of their data were included in the analyses (N=197).
- In both analyses, 10,000 bootstrapped estimates were used for the construction of 95% percentile corrected confidence intervals (CIs) for the conditional indirect effects. In the moderated mediation, these bootstrapped CIs were used to assess the significance of the indirect effects at specific values of the moderator (change in pain self-efficacy) using the "pick-a-point" approach.
- The centered mean and +/- 1 SD of pain self-efficacy were used to represent moderate, high, and low values of pain self-efficacy, respectively.
- The criterion for statistical significance was the absence of zero within the confidence intervals.

RESULTS

MEDIATION RESULTS

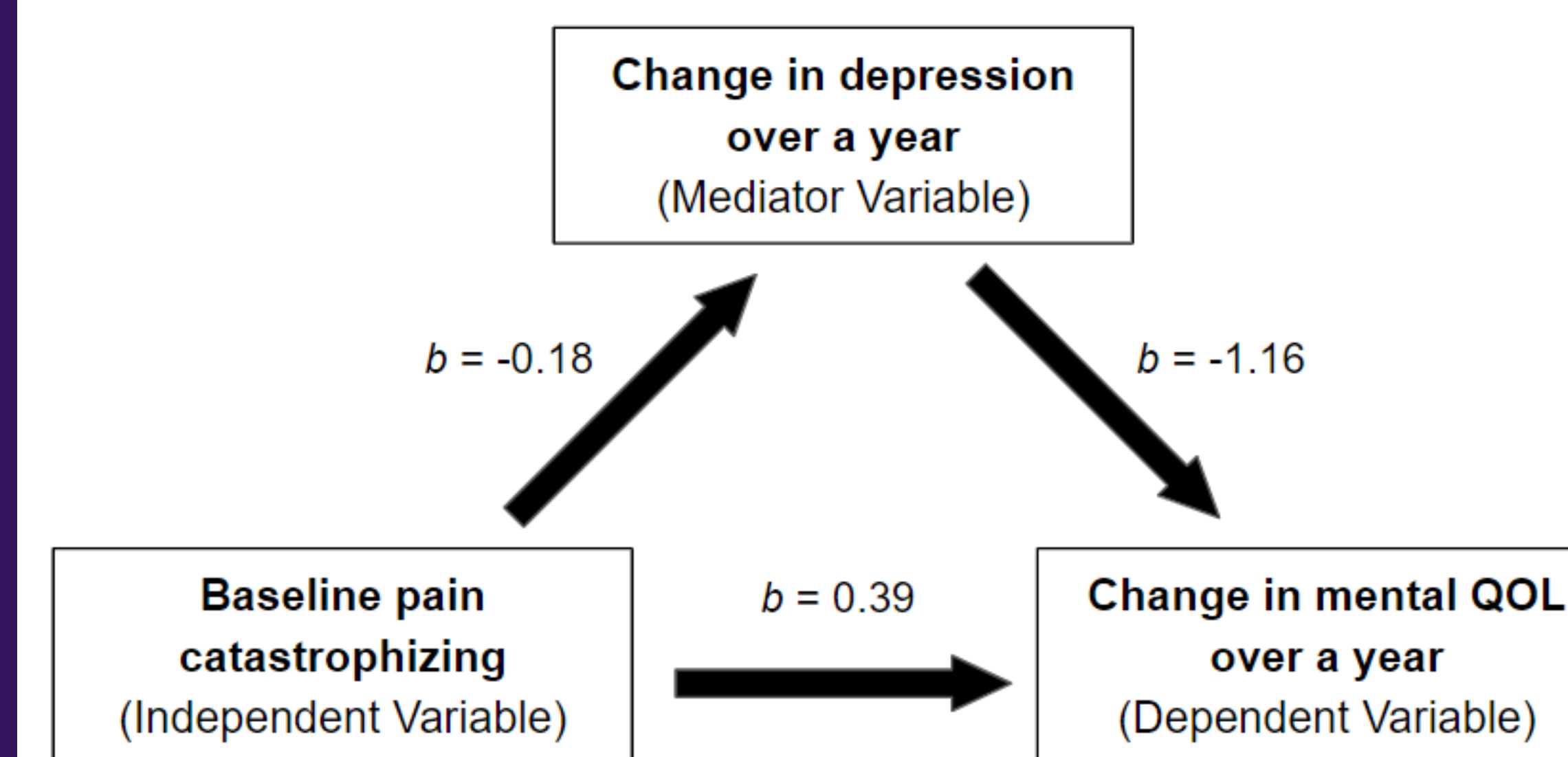


Figure 1. The mediation model of the relationships between pain catastrophizing, mental QOL, and depression. All relationships were significant. The reported *bs* are standardized regression coefficients.

Participants' change in depression significantly mediated the relationship between baseline pain catastrophizing and the change in mental QOL over the year.

MODERATED MEDIATION RESULTS

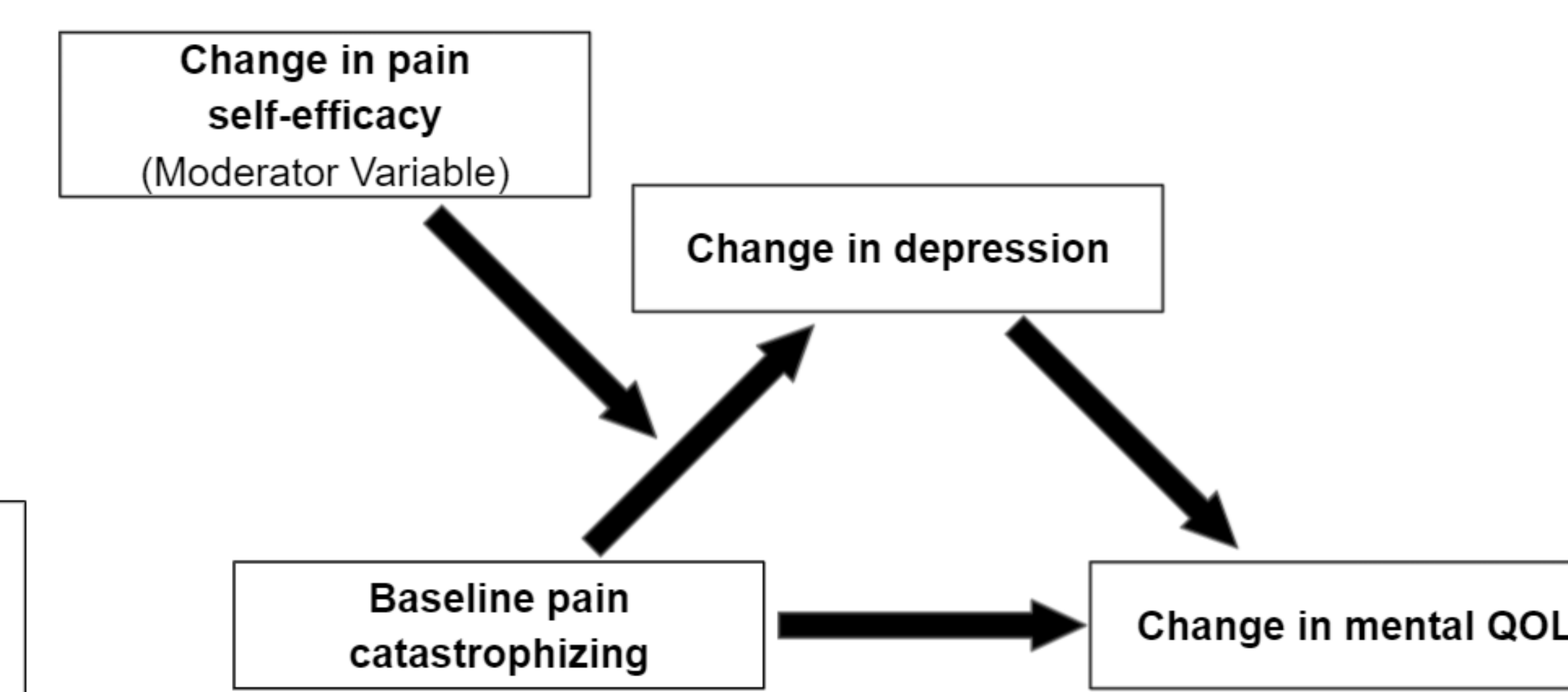


Figure 2. Moderated mediation model of the relationships between pain catastrophizing, quality of life, depression, and pain self-efficacy based on Hayes Model 7. The relationship between baseline pain catastrophizing and change in depression was moderated by the change in pain self-efficacy, $b = -0.14$, $z = -3.31$, $CI_{95\%}[-0.216; -0.044]$.

The relationship between baseline pain catastrophizing and the change in depression is significantly moderated by participants' change in pain self-efficacy.

MODERATION EFFECT

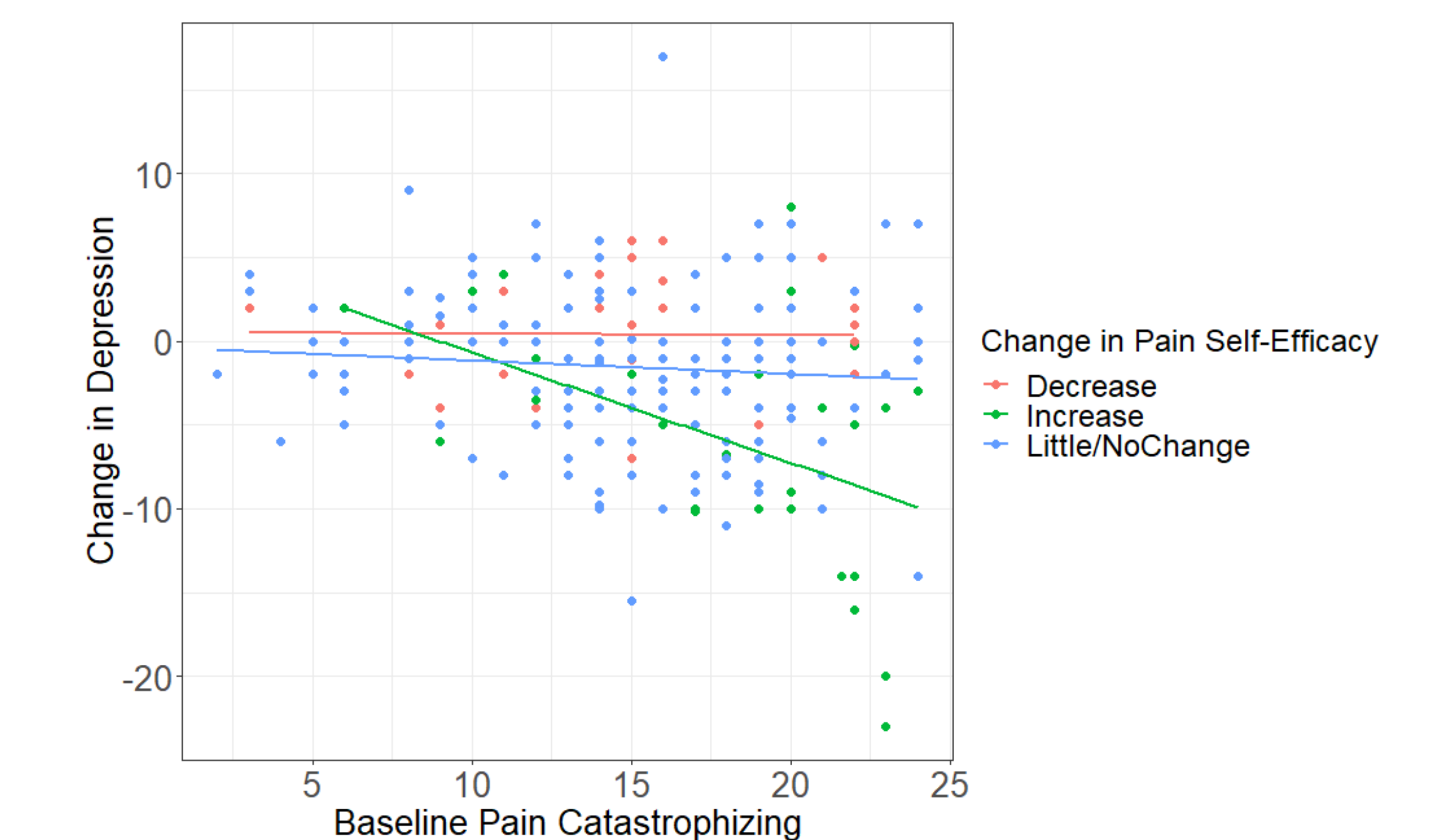


Figure 3. The relationship between pain catastrophizing and change in depression was examined at one standard deviation below (N=25), above (N=35), and at mean levels (N=137) of pain self-efficacy.

There is almost no relationship between pain catastrophizing and the change in depression when pain self-efficacy is stable or decreases. This relationship is very strong when pain self-efficacy increases.

PEARSON CORRELATIONS

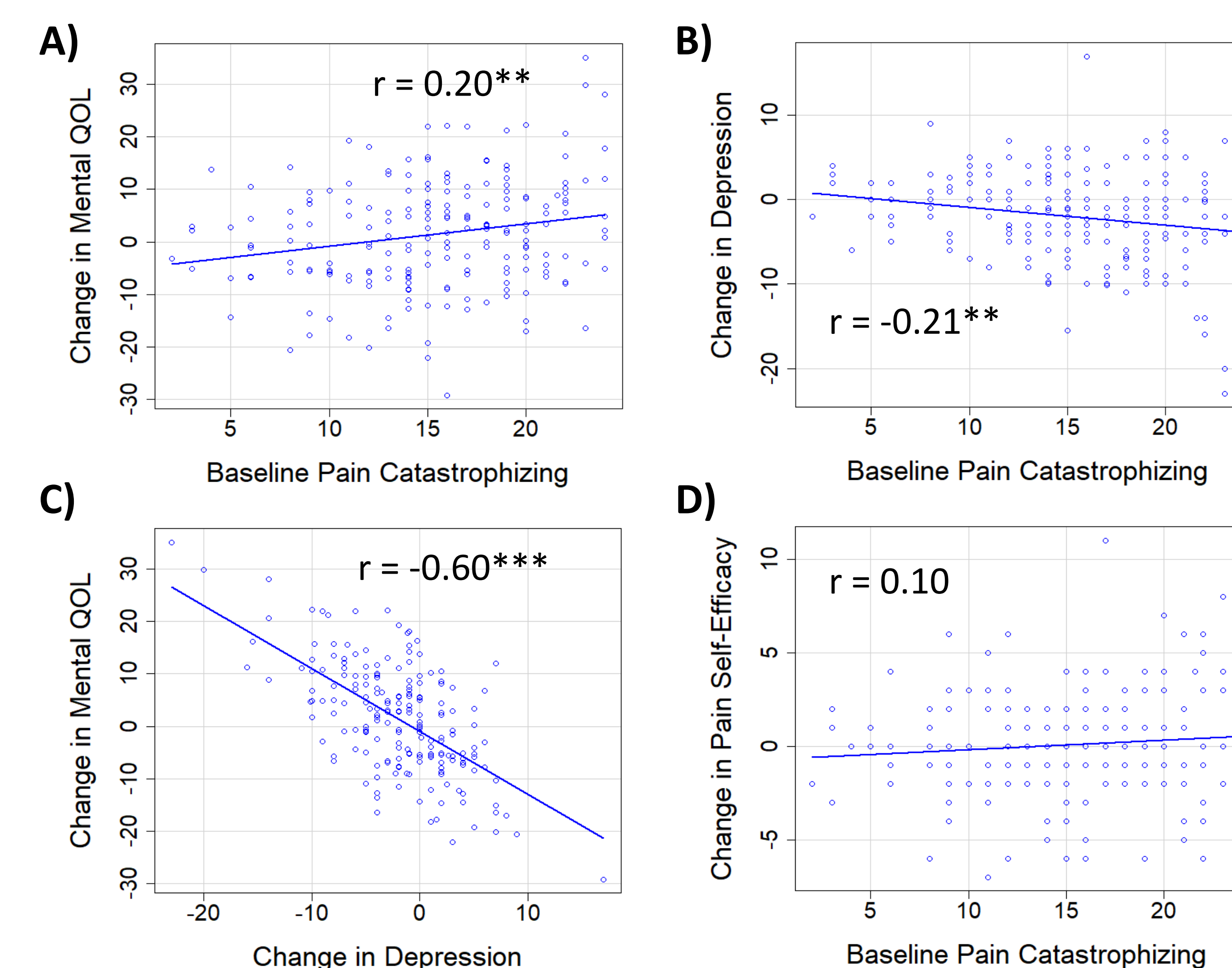


Figure 4. **A)** The correlation between pain catastrophizing and change in mental QOL. **B)** The correlation between pain catastrophizing and change in depression. **C)** The correlation between the change in depression and change in mental QOL. **D)** The correlation between pain catastrophizing and change in pain self-efficacy. Note: *** $p < 0.001$, ** $p < 0.01$.

CONCLUSION

Our results highlight the roles of cognitive and affective factors and their impact on mental QOL in adults with chronic pain. Understanding the psychological factors that predict increased mental QOL is clinically useful, since medical teams can optimize these positive QOL changes through psychosocial interventions aimed at improving patients' pain self-efficacy. Our findings suggest that individuals who present with high pain catastrophizing should be targeted for self-management programs that improve self-efficacy.

REFERENCES

Acknowledgements

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