



# SELF-REPORTED COGNITIVE FUNCTION IN INDIVIDUALS TAKING STRONG OPIOIDS TO MANAGE CHRONIC NON-CANCER PAIN

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## HIGHLIGHTS

- Cognitive issues may occur in people taking opioids for chronic non-cancer pain.
- We investigated associations between opioid use factors & self-reported cognition.
- Opioid use was not linked to variation in cognitive issues.
- However, pain & distress (e.g., depression) were.

## 1. BACKGROUND

- Opioids often prescribed for chronic non-cancer pain (CNCP); may → cognitive issues (e.g., 'brain fog').<sup>1,2</sup>
- Problematic for everyday living.
- Few studies on self-reported cognitive issues in CNCP populations.

### Research questions:

1. Are opioid dose & treatment duration associated with frequency of cognitive issues in those with CNCP?
2. ↑ cognitive issues in CNCP + opioid group, vs. healthy people?

## 2. METHODS

In this correlational study, participants (18-65yrs), prescribed strong opioids for CNCP, completed an online survey assessing opioid use, cognitive function, and potential confounds. Key factors included:

- **Opioid use:** Treatment length, past week average daily dose (oral morphine equivalent - OME).
- **Benzodiazepine use:** Past week average daily dose (oral diazepam equivalent - ODE).
- **Pain:** Past 24 hr severity, interference (Brief Pain Inventory - BPI).
- **Psych. distress:** Past month depression/anxiety symptoms (K10).
- **Cognitive function:** Frequency of past week cognitive issues (e.g., poor concentration), prospective (future) & retrospective (past) memory failures (PROMIS Cognitive Function v2.0 & Prospective Retrospective Memory Questionnaire - PRMQ, respectively).

## 3. RESULTS DESCRIPTIVES

N = 226 (33 male); median age = 46.

### Pain:

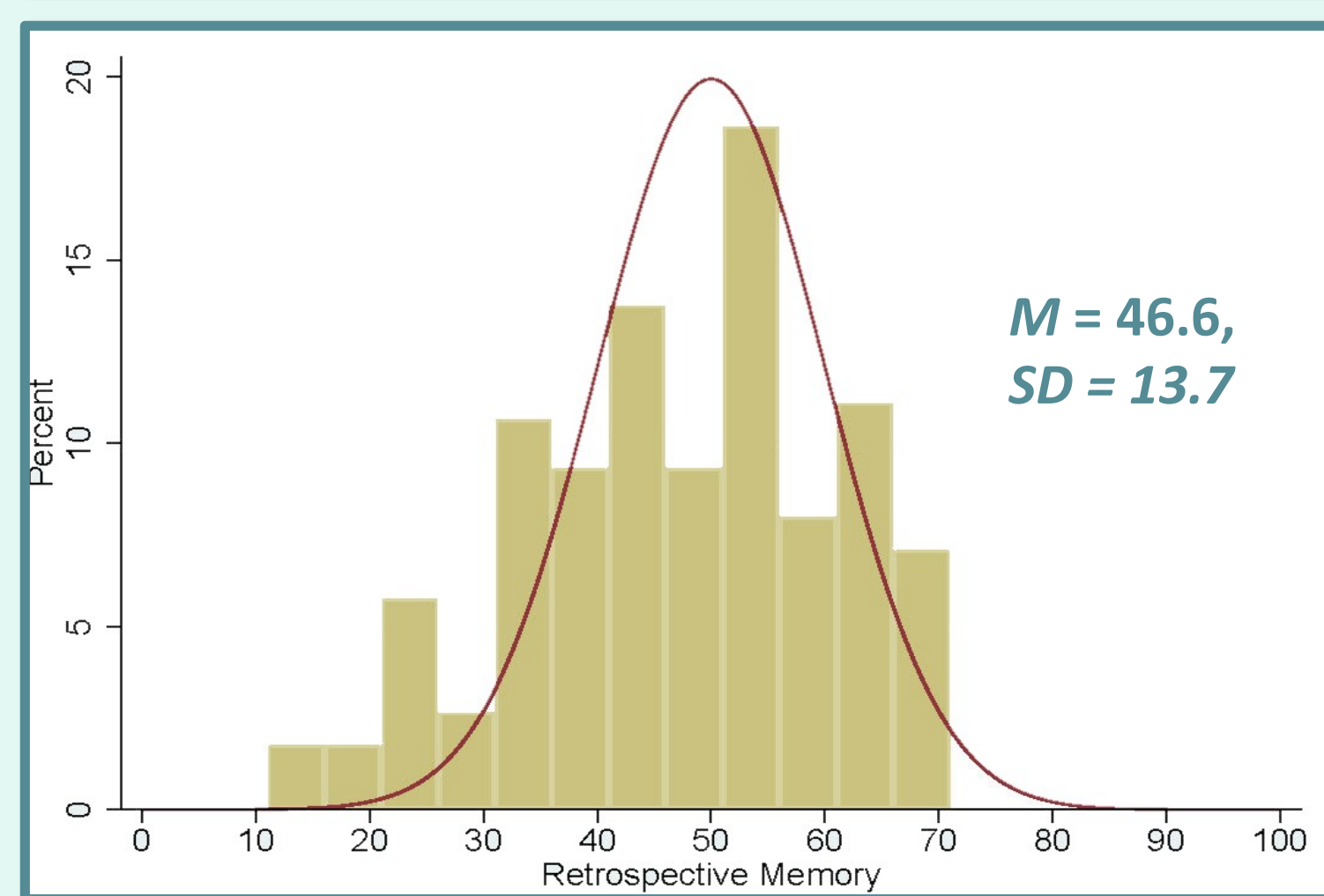
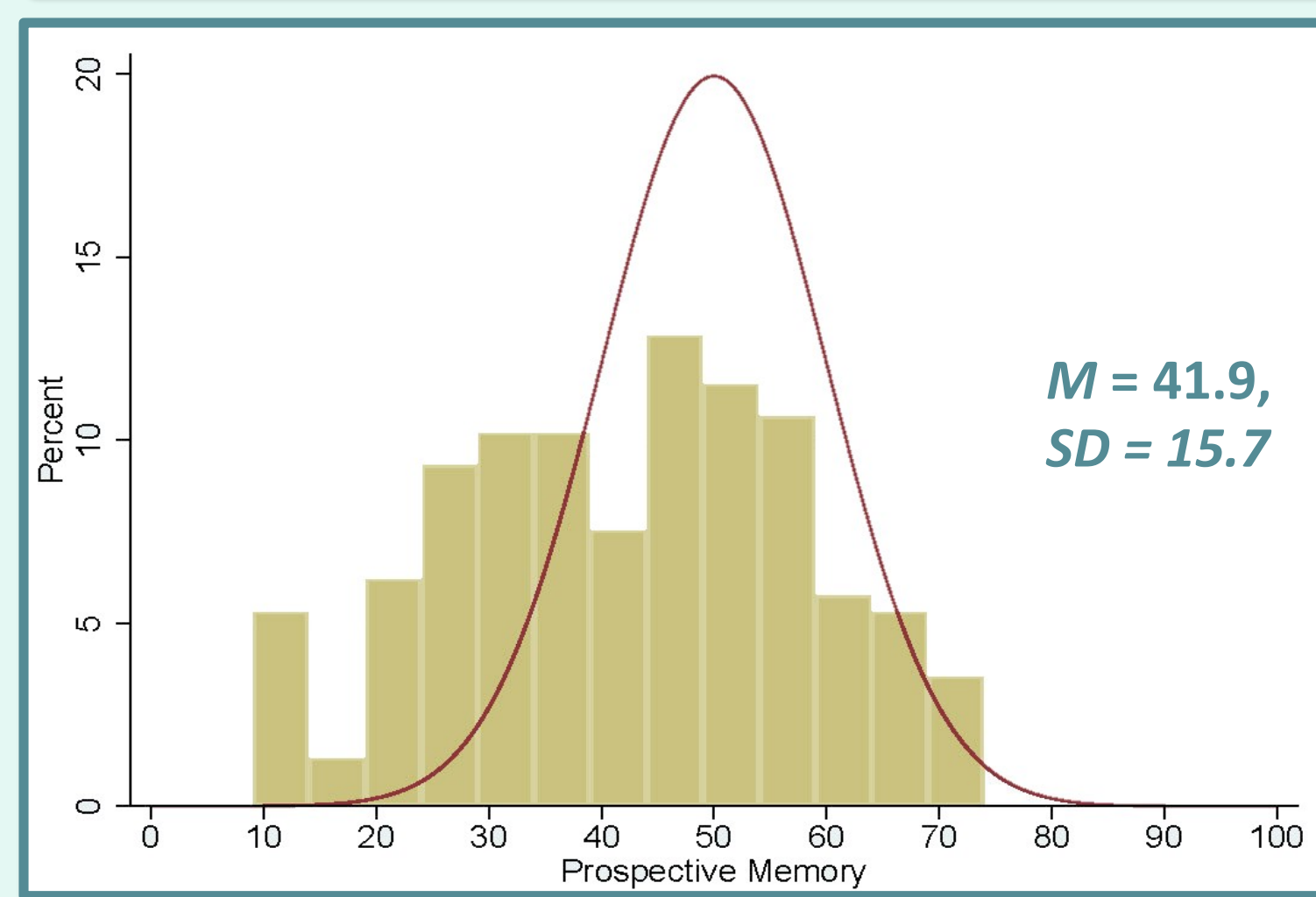
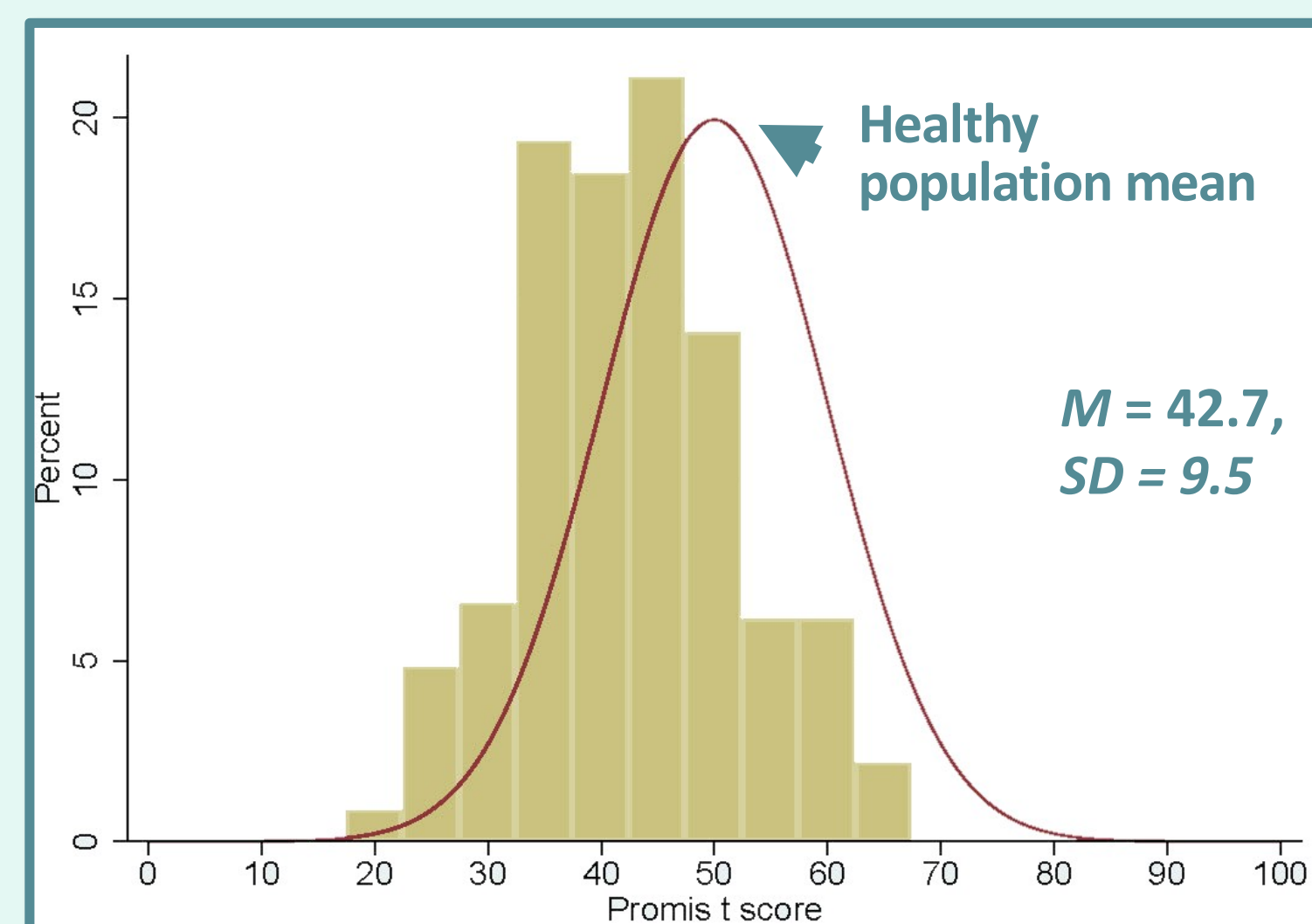
- Most had pain for 8 yrs
- Top pain types: back pain (78.0%), arthritis (56.4%), headaches (49.8%)
- Pain severity:  $M = 5$  (max. 10)
- Pain interference:  $M = 7$  (max. 10).

### Opioids:

- Most had taken opioids for 4 yrs
- Top opioids: oxycodone (52.4%), codeine (48.9%), tramadol (20.3%)
- Median average daily OME = 40.0mg (range: 1.8-418.0mg).

### Other:

- 28.3% used benzodiazepines
- Median average daily ODE = 3.6mg (range: 0.3-45.0mg)
- 59.8% had K10 scores  $\geq 24$  (moderate-severe distress).



Figures 1-3: Percentage of respondents who achieved certain scores for the PROMIS & PRMQ prospective and retrospective scales (bars), and from a healthy population where  $M=50$ ,  $SD=10$  (lines). For all scales, CNCP respondents typically had lower scores than the healthy population, and these scores were not normally distributed.

## COGNITION VS. HEALTHY PEOPLE

- We compared CNCP data with known scores from healthy people.
- Mean scores significantly lower than in healthy populations for all scales,  $p < .001$  (Figures 1-3).
- Indicates more frequent issues.

## COGNITIVE ISSUES & OPIOIDS

- 3 x hierarchical regression models ('model' = opioid use + other factors).
- Is variation in opioid dose/treatment duration (predictors) linked to frequency of cognitive issues (outcomes) – i.e., is ↑ opioid dose & longer treatment duration associated with ↑ cognitive issues?
- + other factors → stronger association with cognitive issues?

Table 2: Hierarchical regression analyses for PROMIS & PRMQ scales

Model	PROMIS	PRMQ - prospective	PRMQ - retrospective
Step 1: Average daily OME	-- $F(1,164)=2.30$	-- $F(1,164)=0.35$	-- $F(1,164)=0.10$
Step 2: + opioid use duration	-- $F(2,163)=2.45$	-- $F(2,163)=0.78$	-- $F(2,163)=0.73$
Step 3: + average daily ODE	-- $F(3,162)=1.62$	-- $F(3,162)=0.72$	-- $F(3,162)=0.60$
Step 4: + pain scores	-- $F(5,160)=1.18$	↑ $F(5,160)=2.51^*$	↑ $F(5,160)=3.39^*$
Step 5: + age, sex	-- $F(7,158)=1.36$	-- $F(7,158)=2.22^*$	-- $F(7,158)=2.59^*$
Step 6: + K10 score	↑ $F(8,157)=9.78^{**}$	↑ $F(8,157)=2.84^*$	↑ $F(8,157)=3.54^*$

↑ model fit significantly improved from last step. – no significant change from last step.

\*  $p < .050$  \*\*  $p < .001$

### PROMIS scores:

- No significant association with opioid dose, duration (Steps 1, 2).
- + ODE, pain, & demographic variables → no change (no significant link).
- + K10 → significant association with scores (29.9%,  $\Delta R^2 = 0.28$ ).

### PRMQ prospective & retrospective memory scores:

- No significant association with opioid dose, duration.
- + ODE, demographic variables → no change.
- + pain, K10 → significant association with scores (prospective: 8.1% of variance,  $\Delta R^2 = 0.06$ , 0.04; retrospective: 11.0%,  $\Delta R^2 = 0.09$ , 0.05).

## 4. CONCLUSIONS

- People with CNCP reported ↑ cognitive issues than healthy people.
- But... non-significant association between opioid use & cognition.
- Rather, psychological distress - and to a lesser degree, pain - was linked to more frequent issues with cognition.
- Notably, the sample reported high levels of psych. distress.
- Future research: objective cognition in CNCP groups?

## REFERENCES

- <sup>1</sup> Dhingra, L., et al. (2015). Cognitive effects and sedation. *Pain Medicine*, 16(S1), 37-43.
- <sup>2</sup> Moriarty, O., et al. (2017). Cognitive impairment in patients with chronic neuropathic or radicular pain: An interaction of pain and age. *Frontiers in Behav. Neuro.*, 11, 100.

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