

# Tailoring a digital psychological intervention (WebMAP Mobile) for adolescents with chronic pain and co-morbid insomnia symptoms

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## Introduction

- Existing evidence-based psychological interventions for youth with chronic pain (CP) do not treat insomnia. However, it is a common comorbidity that can cause poor treatment response. Tailoring psychological interventions to meet the treatment needs of youth with CP and insomnia may increase treatment benefit.
- In this secondary analysis, we evaluated the feasibility and preliminary efficacy of tailoring an mHealth psychological intervention for youth with CP (WebMAP Mobile; WMM) by screening for insomnia and providing a supplemental insomnia treatment module.

## Intervention

- The program can be completed in **6 weeks**, during which teens visit different places to learn cognitive and behavioral skills for managing chronic pain.
- Core treatment modules** include: 1) pain **education**, 2) stress, emotions, and **thoughts** (e.g., pleasant activity scheduling, thought stopping), 3) **relaxation** and imagery, 4) **lifestyle and school** interventions (e.g., sleep habits, school plan), 5) **staying active** (e.g., activity pacing, graded exposure), and 6) maintenance and **relapse prevention**.
- At initial log-in, youth complete **screening questions** to set up their personal profile and to evaluate the need for **additional modules** targeting **negative mood** and **insomnia** symptoms.
- Teens monitor symptoms, track skills practice, and complete behavioral assignments.
- Badge and **reward systems** are included to enhance motivation.



## Methods

### PROCEDURES

- This was a hybrid effectiveness-implementation cluster RCT conducted in 8 specialty clinics, comparing WMM vs usual care in youth with CP ages 10-17 years. For this report, we examined the 68 youth who were randomized to receive WMM, a 6-module CBT for pain management intervention delivered via mobile app, and downloaded it.
- Participants completed 2 items from the Adolescent Sleep Wake Scale to screen for insomnia during WMM app set-up (problems falling asleep/staying asleep). Participants who screened positive were automatically assigned an additional module providing stimulus control and sleep restriction to treat insomnia.

### PARTICIPANTS

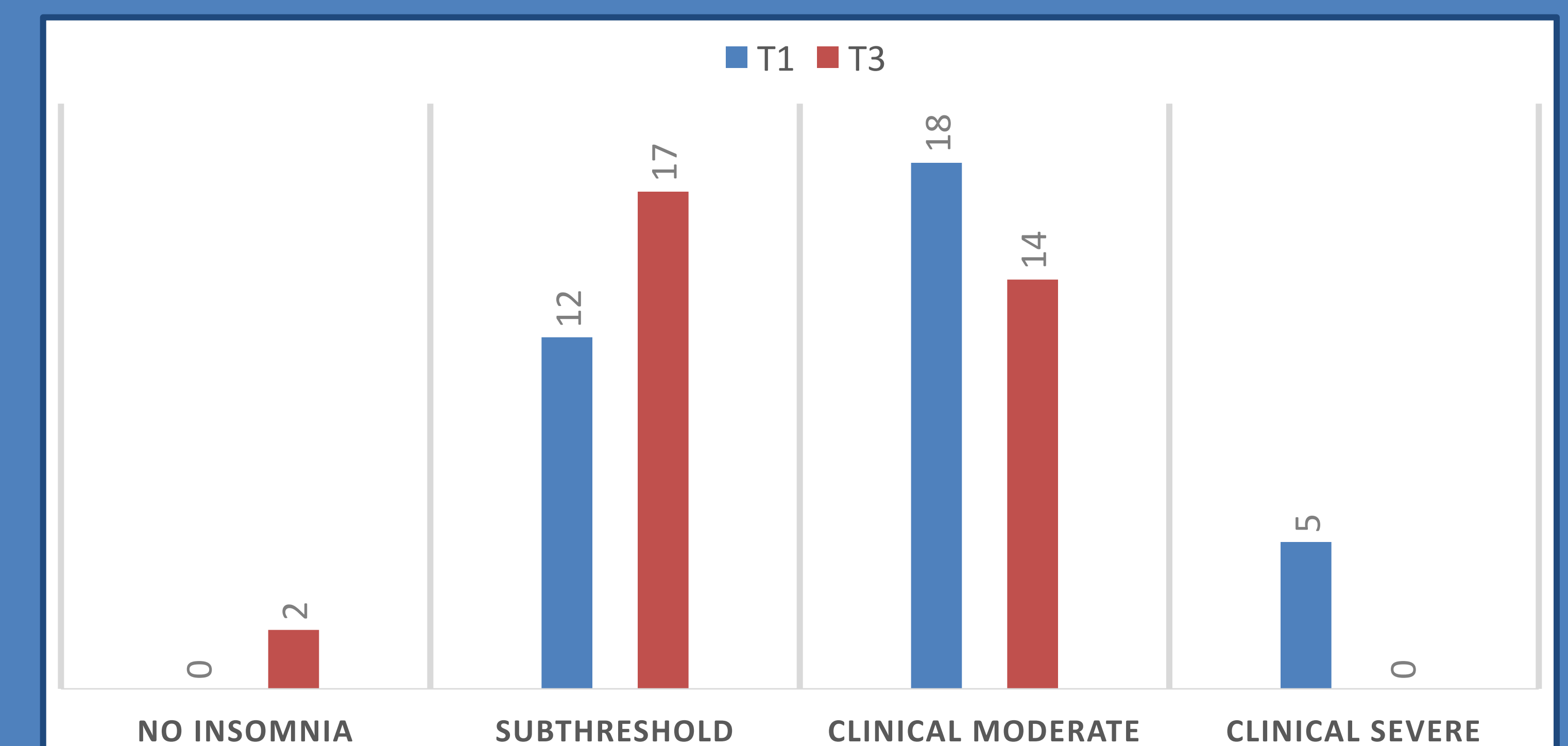
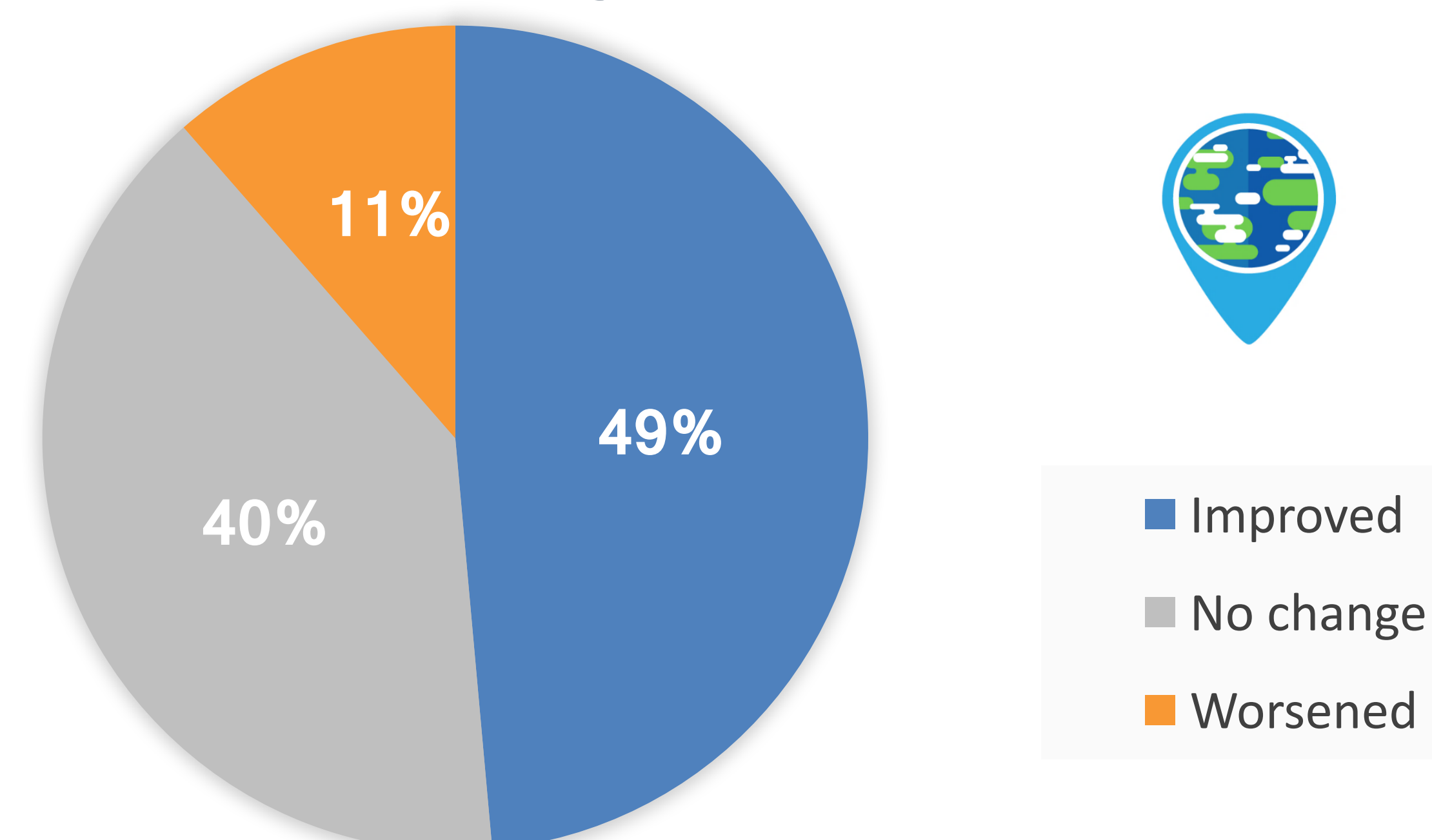
- N = 143 patients enrolled (8 clinics across the U.S.)
  - Usual care (n = 71)
  - WebMAP mobile (n = 72)
- Mean age = 14.4, range 10-17 years; Sex: 80% female
- T1 pain intensity (0-10 NRS) = 5.5; Interference (CALI-9) = 37.5; Insomnia (ISI) = 15.8
- N = 68 of 72 downloaded and used the app
- 58% (40/68) screened positive and were assigned the additional insomnia module.
- 15/40 (22%) completed the module in full.



## Results

- Chi-square tests evaluating change in insomnia classification on the Insomnia Severity Index indicated that most participants who received the insomnia module reported **improved insomnia status** from pre-treatment to 3-month follow-up:  $\chi^2 = 13.248(6)$ ,  $P = 0.04$ .
  - 49%** improved
  - 11%** worsened
  - 40%** showed no change

Participants receiving the Insomnia Module



## Conclusions

- Our findings demonstrate feasibility of screening for insomnia and delivering supplemental insomnia treatment to youth receiving a mHealth intervention for CP.
- Although completion of the insomnia module was modest, nearly half of those who received the module reported improved insomnia

- symptom status.
- Rigorous RCTs evaluating the efficacy of tailored interventions targeting individual differences such as insomnia are needed to improve treatment outcomes for youth with CP.

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