

INTRODUCTION

- Physical functioning is an important outcome domain in pediatric chronic pain treatment
- Adolescents with chronic pain report withdrawal from participation in physical activities such as sports and gym
- Psychological treatments for chronic pain have been shown to reduce pain, but less is known about whether these treatments affect physical functioning outcomes (Eccleston et al., 2002; 2009)
- Previous research has shown that teens with chronic pain have lower levels of daytime activity than healthy teens, as measured by actigraphy (Long, Palermo & Manees, 2008)

Study Aims:

- Utilize actigraphy as an objective measure of daytime activity in adolescents with chronic pain
- Examine correlates of daytime activity in a sample of adolescents with chronic pain
- Examine whether CBT increased physical activity in adolescents participating in an RCT of web-based CBT for chronic pain

METHODS

Sample

- Inclusion criteria:** 11-17 years, pain ≥ 1 /wk, present for ≥ 3 months, pain not due to serious medical condition
- Subset of larger RCT sample (RCT $N=48$)
- $n=32$, age $M=14.8$ years, 69% female
- Primary pain diagnoses: abdominal pain (47%), musculoskeletal pain (31%), and headache (22%)
- At baseline: Pain severity $M=6.3$ (0-10 scale); 72% had daily pain
- Following baseline assessment, children and their parents were randomly assigned to two conditions: *Internet treatment* ($n=16$) or *Wait-list control* ($n=16$)

Internet Treatment: The Web-MAP Program

- Web-based Management of Adolescent Pain (Web-MAP) is an interactive website with text, audio, and video content
- 8 modules designed to be completed weekly (approx. 9 hours of treatment exposure per family) with skill practice assignments
- Online therapist responded to assignments and messages

Physical Activity Content in the Web-MAP Program

- Psychoeducation regarding the importance of maintaining participation in normal activities
- Instruction in activity pacing as a technique for gradually increasing ability to participate in activities despite pain
- Parent and child modules focused on healthy lifestyle choices, including increasing "uptime" and identifying aerobic activities in which the child can participate

MEASURES

Children completed retrospective and online diary reports of the following variables pre-and immediately post-treatment:

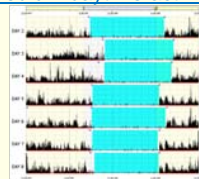
- Activity Limitations:** Child Activity Limitations Interview (CALI; Palermo et al., 2004)
- Pain Intensity:** Daily intensity rating (NRS 0-10)
- Health-related Quality of Life (HRQOL)** Physical HRQOL subscale of the PedsQL (Varni et al., 1999)
- Fear of Activity:** Fear and Avoidance of Physical Activity Questionnaire (FABQ; Waddell et al., 1993)
- Physical Activity:** Teens wore an Actiwatch-64 device for a 7-day monitoring period pre- and post-treatment. Scoring yielded the following variables, averaged across 7 days:
 - Mean activity** level (activity counts per minute)
 - Peak activity** level (activity counts per minute)
 - Sedentary activity** (minutes per day)

ANALYSES

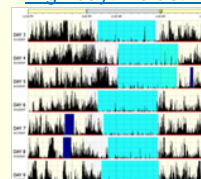
- ANCOVAs with pre-treatment values entered as covariates tested pre- to post-treatment group differences in daytime activity levels
- Correlations used to examine associations between actigraphy variables of physical activity and self-report measures of activity limitations and other outcomes

Actigraphy Data Examples

Medium daytime activity

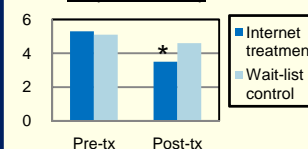


High daytime activity



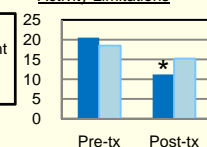
RESULTS: SELF-REPORT OUTCOMES

Diary Pain Intensity



Diary reports of pain intensity were significantly lower post-treatment in the Internet treatment group: $F(1, 30) = 4.40$, $p = .04$, partial $\eta^2 = .13$

Activity Limitations

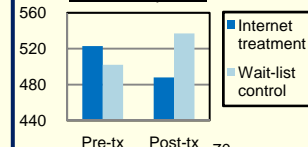


CALI scores were significantly lower post-treatment in the Internet treatment group: $F(1, 30) = 4.14$, $p = .05$, partial $\eta^2 = .12$

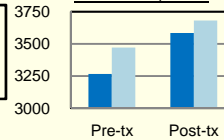
RESULTS: ACTIGRAPHY OUTCOMES

No change in activity level variables or in time spent in sedentary activity in either group pre- to post-treatment

Mean Activity Level



Peak Activity Level



Sedentary Minutes/day



All p 's = ns

CONCLUSIONS

- Although this Internet-delivered CBT treatment effectively reduced self-report of pain and activity limitations, no change was observed in an objective measure of physical activity immediately post-treatment
- Actigraphy was associated with a number of self-report measures in the expected directions, with higher activity being related to fewer activity limitations, lower pain intensity, and better physical quality of life
- More intensive treatments may be needed in order to increase physical activity participation in teens with pain
- Additional research is needed to better understand physical functioning, activity limitations, physical activity, and physical fitness in this population

RESULTS: PRE-TREATMENT DAYTIME ACTIVITY

- Physical activity levels were low at baseline, with 40% of adolescents not reaching moderate levels of activity
- On average, adolescents spent about one hour per day in sedentary activity

RESULTS: BASELINE CORRELATIONS

- Mean and peak daytime activity were associated with pain intensity at the trend level ($r = -.30$ and $r = -.29$, p values $< .10$)
- Peak activity was associated with diary reports of activity limitations on the CALI ($r = -.33$, $p < .05$)
- Mean and peak activity were associated with Physical HRQOL as measured by the PedsQL ($r = .47$ and $r = .37$, p values $< .05$)
- Daytime activity levels were not related to fear of activity