

Development of the Pain-Related Beliefs and Attitudes about Sleep (PBAS) scale for the assessment and treatment of insomnia comorbid with chronic pain

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INTRODUCTION

Maladaptive beliefs about the sleep-pain interaction are possible factors underlying perpetuation of sleep disturbances in chronic pain-related insomnia. However, there is currently no validated instrument that specifically assesses these beliefs.

We evaluated the psychometric and functional properties of a 10-item Pain-Related Beliefs and Attitudes about Sleep (PBAS) scale (Table 1), designed to assess pain-related dysfunctional beliefs and attitudes about sleep among people with chronic pain.

METHODS

The PBAS scale was administered to four clinical samples of chronic pain patients with comorbid insomnia (Table 2); to examine the scale's psychometric properties (n=137), test-retest reliability (n=26), sensitivity to treatment (n=20), and generalizability in a separate group of chronic pain patients with or without insomnia (n=62).

Participants also completed the Brief Pain Inventory (BPI), Insomnia Severity Index (ISI), Dysfunctional Beliefs and Attitudes about Sleep Scale (DBAS-16) & Anxiety and Preoccupation about Sleep Questionnaire (APSQ).

RESULTS

Table 1 FACTOR STRUCTURE & INTERNAL CONSISTENCY

| Strongly Disagree 0 1 2 3 4 5 6 7 8 9 10 Strongly Agree | M | FACTOR 1 PAIN INTERFERING SLEEP | FACTOR 2 NEGATIVE RECIPROCAL LINK BETWEEN SLEEP AND PAIN |
|---|--------------------|--|--|
| My insomnia is largely a result of the pain and there is nothing I can do about it. | 6.47 | 0.79 | 0.17 |
| With the pain, I can never get myself comfortable in bed. | 7.50 | 0.82 | 0.12 |
| The pain is always there when you try to have a good night's sleep. | 7.31 | 0.78 | 0.05 |
| When I am in pain, I simply can't get to sleep no matter how hard I try. | 6.94 | 0.64 | 0.31 |
| I know I can't sleep through the night because the pain will wake me up. | 6.42 | 0.64 | 0.32 |
| I get very annoyed when the pain wakes me up. | 6.39 | 0.18 | 0.64 |
| Not sleeping well is going to make my pain worse the next day. | 5.01 | 0.06 | 0.83 |
| I won't be able to cope with the pain if I don't sleep well. | 4.68 | 0.11 | 0.88 |
| Unless I get rid of the pain, I won't sleep well. | 5.98 | 0.26 | 0.65 |
| The insomnia is taking away one of my few respites from pain. | 5.56 | 0.24 | 0.65 |
| Variance accounted for (R²) | 58.81 | 29.15 | 29.66 |
| Internal consistency (α) of items in bold | 0.84 | 0.82 | 0.81 |
| Mean score (SD) of items in bold | 6.23 (2.00) | 6.93 (2.14) | 5.53 (2.51) |

CONCURRENT VALIDITY

In Sample 1, PBAS scores significantly correlated moderately with **DBAS-16 (r= .65)**, **APSQ (r= .57)** and **ISI (r= .37)**

Sample 4 PBAS scores also showed significant moderate correlations with **DBAS-16 (r= .57)**, **APSQ (r= .45)** and **ISI (r= .64)**

Table 2 SAMPLE CHARACTERISTICS

| | Sample 1 (n = 137) | Sample 2 (n = 26) | Sample 3 (n = 20) | Sample 4 (n = 62) |
|--------------------------|-----------------------|----------------------|----------------------|----------------------|
| Age (yrs) | 46.0 (11.3) | 50.1 (10.5) | 48.5 (8.9) | 52.3 (11.1) |
| Sex (Female %) | 75.9 | 53.8 | 90.0 | 67.7 |
| Ethnicity (Caucasian %) | 72.3 | 80.8 | 65.0 | 100 |
| Pain duration (yrs) | 8 | 4.3 | 6.1 | 8 |
| Pain severity (0-10 NRS) | 5.7 (2.6) | 6.1 (2.3) | 6.1 (1.8) | 5.1 (2.3) |
| Insomnia duration (yrs) | 5 | 4 | 6 | 4.5 |
| Insomnia severity (ISI) | 20.4 (3.9) | 20.4 (3.6) | 20.3 (3.3) | 14.4 (8.0) |

Figure 1 TEMPORAL STABILITY

Significant correlation ($r = 0.91$) & no significant change between PBAS mean scores one week apart ($t(25) = 0.44, p = 0.66$)

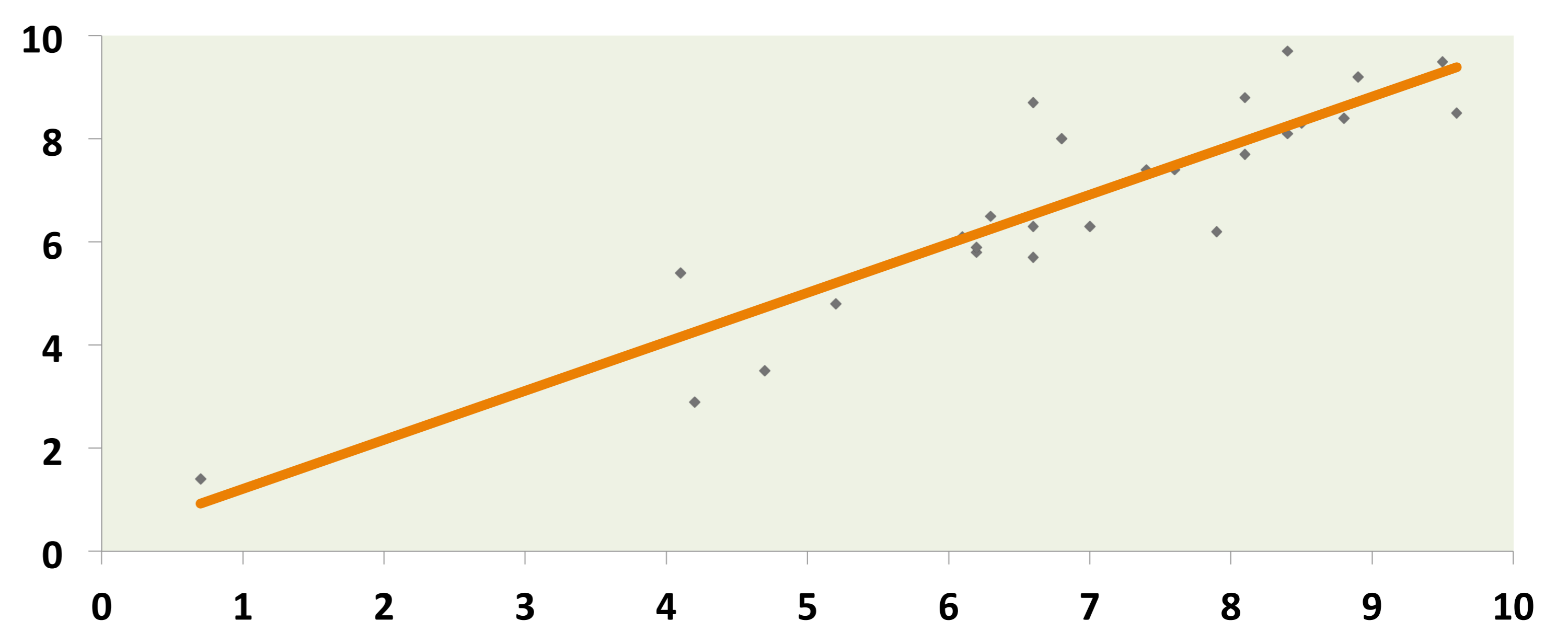
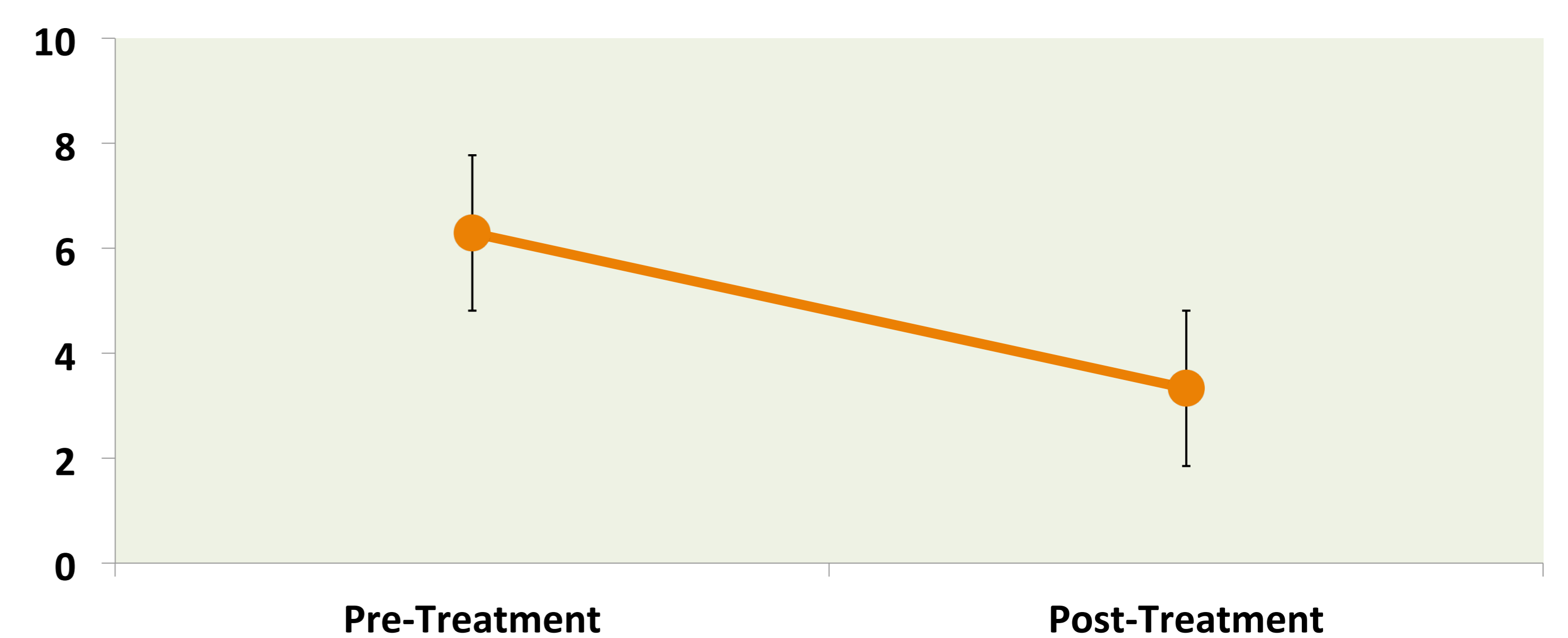


Figure 2 TREATMENT SENSITIVITY

Significant reductions in mean PBAS scores from pre to post-treatment following hybrid cognitive behavioural therapy for sleep & pain management ($t(19) = 6.94, p < 0.0001, r = .85$)



PREDICTIVE VALIDITY

Using a stepwise multiple regression model, **PBAS scores significantly predicted ISI scores** individually accounting for 14% and 40% of the variance respectively in Sample 1 and Sample 4. PBAS also jointly predicted ISI scores with DBAS-16 in Sample 1 accounting for 17% of the variance & with APSQ scores in Sample 4 accounting for 47% of the variance.

Only **PBAS scores emerged as a significant predictor of BPI pain interference scores** in Sample 1, accounting for 14% of the variance.

CONCLUSIONS

Pain-related sleep beliefs appear to be an integral part of chronic pain patients' insomnia experience.

These initial findings suggest that the PBAS can be used as a reliable, valid, and easily administered tool to quantify these perceived beliefs.