

# The Indirect Role of Perseverative Thinking in the Association Between Perceived Stress and Sleep Disturbance among Adults with Skin Disease Symptoms

Heather L. Clark, M.S. & Laura J. Dixon, Ph.D.

✉ hclark@go.olemiss.edu

## INTRODUCTION

- Perseverative thinking (PT) is proposed to be transdiagnostic etiological and maintenance factor in physical and mental health concerns.
- In non-clinical samples, PT mediates the relationship between stress and sleep impairment.
- Studies suggest more than half of adults with skin disease experience sleep disturbance, and perceived stress is linked to diminished quality of sleep.
- Hypothesis: PT will mediate the relationship between perceived stress and insomnia severity in those with self-reported skin disease symptoms, wherein greater perceived stress will contribute to higher PT, which will lead to higher levels of insomnia.

## METHODS

- Adults who screened positive for skin disease symptoms ( $N = 155$ ; 64.5% female) participated via Mechanical Turk.
- Participants completed online self-report measures of perceived stress, perseverative thinking, and insomnia.
- The proposed mediation model was tested using the PROCESS macro for SPSS to estimate the indirect effect through 5,000 bootstrapped re-samples.

## RESULTS

- The two most common self-reported skin problems in the sample were eczema ( $N = 61$ , 39.4%) and acne ( $N = 38$ , 24.5%)
- Analyses revealed the full model accounted for 31% of the variance in insomnia ( $F[2, 134] = 29.82, p < .001$ ).
- Results supported the hypothesis. Perceived stress was indirectly associated with insomnia severity via perseverative thinking (Fig. 2).

Perseverative thinking affects the relationship between **stress** and **sleep** for those with **skin disease symptoms**.

Fig. 1. Portion of Sample Reporting Clinical Levels of Insomnia (ISI > 9)

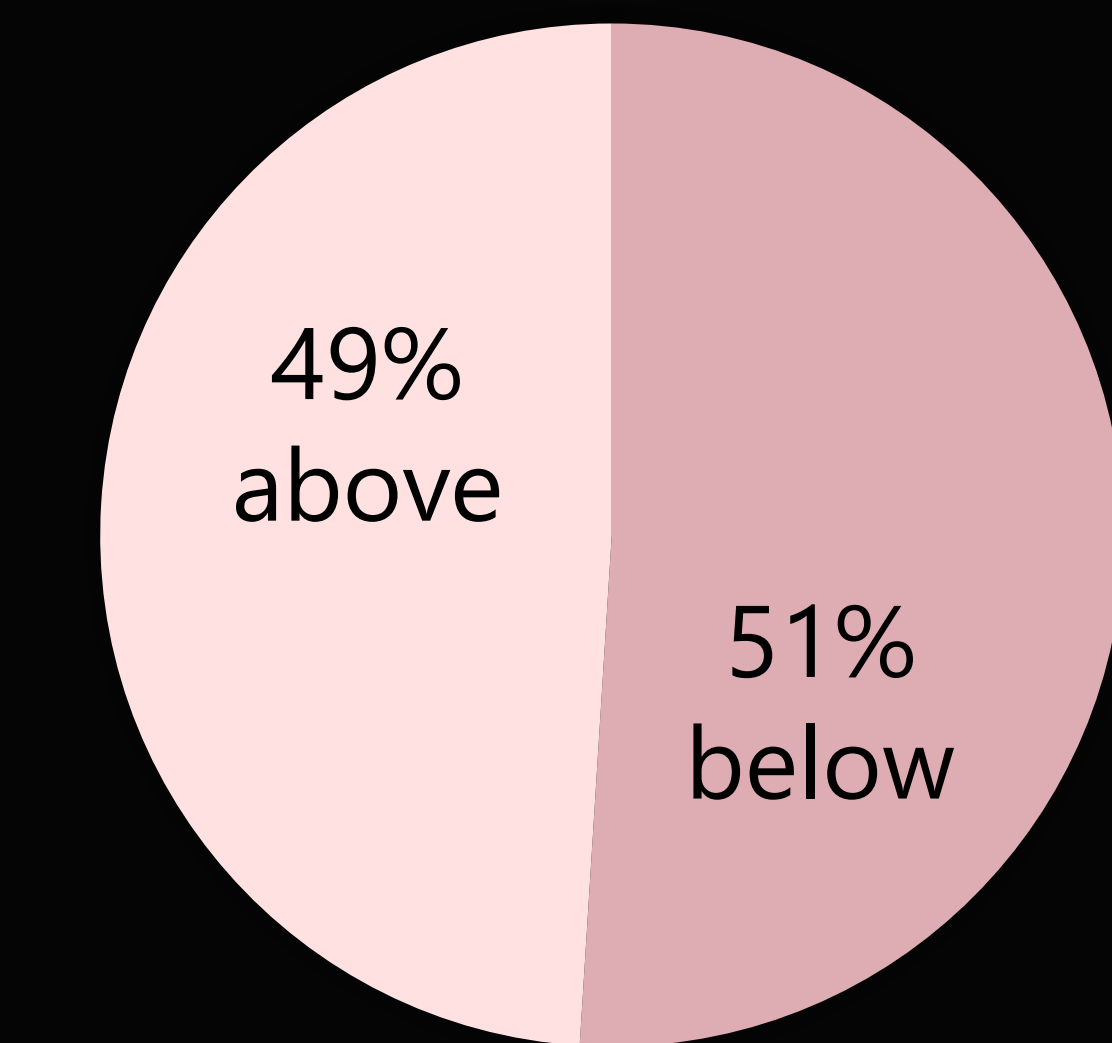
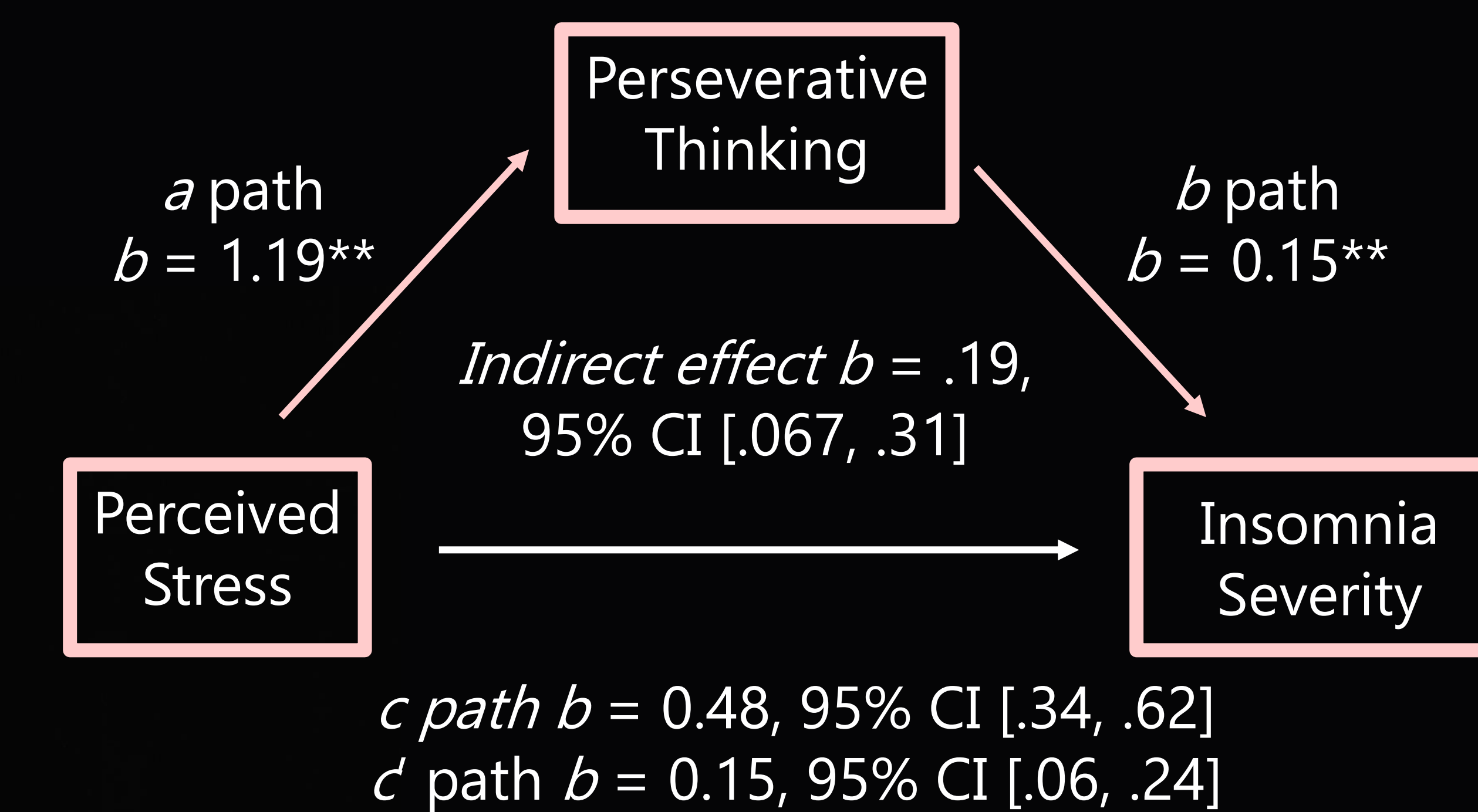


Fig. 2. Mediation Model



## DISCUSSION

- Consistent with prior research, results revealed high rates of sleep disturbance among those with skin disease symptoms.
- As hypothesized, perseverative thinking was found to affect the relationship between stress and sleep.
- Findings indicate those with skin disease symptoms who have a propensity to engage in rumination and PT patterns experience greater sleep disturbances in response to stress.
- PT may cyclically impair sleep, which may exacerbate skin symptoms (e.g., nocturnal itching) and stress, making PT more difficult to regulate.

## IMPLICATIONS

- These findings suggest that perseverative thinking may be an important target for treatment (e.g., CBT) in individuals with skin disease symptoms experiencing sleep disturbance.



**Title:** The Indirect Role of Perseverative Thinking in the Association between Perceived Stress and Sleep Disturbance among Adults with Skin Disease Symptoms

**Authors:** Heather L. Clark, M.S. & Laura J. Dixon, Ph.D.

### **Abstract**

**Introduction:** Repetitive negative thinking (RNT), also known as dysfunctional perseverative thinking, is defined as an adverse, repetitive pattern of thought that is intrusive and mentally taxing (Ehring & Watkins, 2008; Ehring et al., 2011). RNT is proposed to be a transdiagnostic etiological and maintenance factor for a variety of psychiatric and health conditions (Ehring & Watkins, 2008). In particular, RNT has demonstrated significant associations with multiple domains of sleep disturbance in non-clinical populations (Clancy et al., 2020) and has been found to mediate the relationship between stress and sleep disturbance (Thorsteinsson et al., 2019). In skin disease samples, perceived stress is associated with greater levels of psychopathology and diminished quality of life (O’Leary et al., 2004), and symptoms associated with chronic skin conditions are associated with decreased sleep quality (see Thorburn & Riha, 2010 and Kaaz et al., 2019 for reviews). Some studies suggest more than half of adults with skin disease symptoms experience sleep disturbance (Jeon et al., 2017; Wang et al., 2020). Although relationships between these constructs can be derived in other populations, the relationship between these constructs has yet to be examined for those individuals with skin disease symptoms. Therefore, the present study seeks to examine the role of RNT in the relationship between perceived stress and sleep disturbance in this population.

**Method:** Participants ( $n = 155$ ) in the current study were recruited from a larger examination of mental health among a sample of adults with skin disease symptoms (Mturk; data collection is ongoing and will be completed by June of 2020). Participants were predominantly female (64.5%) and white (58.1%), ranging in age from 19 to 64 years ( $M = 32.32$ ,  $SD = 9.63$ ). Participants completed a battery of assessments, including measures of perceived stress (Perceived Stress Scale; Cohen, 1988), repetitive negative thinking (Perseverative Thinking Questionnaire; Ehring et al., 2011), and insomnia (Insomnia Severity Index [ISI]; Bastien et al., 2001). Analyses were conducted using the PROCESS macro (Hayes, 2017) to test a mediation model examining the effect of RNT on the relationship between perceived stress and insomnia.

**Results:** In this sample, 49.0% reported clinical levels of insomnia (ISI  $M = 10.07$ ;  $SD = 6.38$ ). Preliminary results indicated significant associations between perceived stress, insomnia severity, and RNT ( $r_s = .50 - .61$ ,  $p_s < .001$ ). As hypothesized, perceived stress predicted higher levels of RNT ( $a$  path;  $b = 1.19$ ,  $SE = .13$ ,  $p < .001$ ), which predicted higher levels of insomnia ( $b$  path;  $b = 0.15$ ,  $SE = .05$ ,  $p = .001$ ). RNT was found to mediate the relationship between perceived stress and insomnia severity ( $F(2,134) = 29.82$ ,  $p < .001$ ,  $R^2 = .31$ ;  $b = .15$ ; 95% CI: .06 - .30).

**Discussion:** Findings indicate those with skin disease symptoms who have a propensity to engage in rumination and RNT patterns experience greater sleep disturbances in response to stress. RNT may cyclically impair sleep, whereby skin symptoms (e.g., nocturnal itch) are exacerbated leading to increased stress and decreased sleep, making RNT more difficult to regulate (Kaaz et al., 2019; Nota & Coles, 2015). Additionally, evidence suggests RNT plays a significant role in psychological treatment outcome (see Kertz et al., 2015 for a review). Thus, results from the current study have the potential to advance CBT adaptations (Riemann & Perlis, 2009) for those with skin disease by highlighting repetitive negative thinking as a potential treatment target for those experiencing sleep disturbance.

### **References:**

Bastien, C.H., Vallières, A., & Morin, C.M. (2001). Validation of the Insomnia Severity Index as an outcome measure for insomnia research. *Sleep Medicine, 2*, 297-307.

Clancy, F., Prestwich, A., Caperon, L., Tsipa, A., O'Connor, D.B. (2020). The association between worry and rumination with sleep in non-clinical populations: a systematic review and meta-analysis. *Health Psychology Review*. <https://doi-org.umiss.idm.oclc.org/10.1080/17437199.2019.1700819>.

Cohen, S. (1988). *Perceived stress in a probability sample of the United States*. In S. Spacapan & S. Oskamp (Eds.), *The social psychology of health*. (pp. 31–67). Sage Publications, Inc.

Ehring, T., Zetsche, U., Wediacker, K., Schönfeld, S., & Ehlers, A. (2011). The Perseverative Thinking Questionnaire (PTQ): Validation of a content-independent measure of repetitive negative thinking. *Journal of Behavior Therapy and Experimental Psychiatry, 42*, 225-232.

Ehring, T., & Watkins, E.R. (2008). Repetitive negative thinking as a transdiagnostic process. *International Journal of Cognitive Therapy, 1*, 192-205.

Fortune, D., Richards, H.L., Main, C., & Griffiths, C.E.M. (2000). Pathological worrying, illness perceptions and disease severity in patients with psoriasis. *British Journal of Health Psychology, 5*, 71–82.

Fortune, D., Main, C., O'Sullivan, T., & Griffiths, C. (1997). Quality of life in patients with psoriasis: The contribution of clinical variables and psoriasis-specific stress. *British Journal of Dermatology, 137*(5), 755–760.

Hayes, A. F. (2017). *Introduction to Mediation, Moderation, and Conditional Process Analysis, Second Edition: A Regression-Based Approach*. Guilford Publications.

Jeon, C., Yan, D., Nakamura, M., Sekhon, S., Bhutani, T., Berger, T., & Liao, W. (2017). Frequency and management of sleep disturbance in adults with atopic dermatitis: a systematic review. *Dermatologic Therapy, 7*, 349-364.

Kaaz, K., Szepietowski, J.C., & Matusiak, Ł. (2019). Sleep quality among adult patients with chronic dermatoses. *Advances in Dermatology and Allergology*, 6, 659-666.

Kertz, S.J., Koran, J., Stevens, K.T., & Björgvinsson, T. (2015). Repetitive negative thinking predicts depression and anxiety symptom improvement during brief cognitive behavioral therapy. *Behaviour Research and Therapy*, 68, 54-63.

Liu, Y., Li, T., Guo, L., Zhang, R., Feng, X., & Liu, K. (2017). The mediating role of sleep quality on the relationship between perceived stress and depression among the elderly in urban communities: a cross-sectional study. *Public Health*, 149, 21-27.

Nota, J.A. & Coles, M.E. (2015). Duration and timing of sleep are associated with repetitive negative thinking. *Cognitive Therapy and Research*, 39, 253-261.

O'Leary, C.J., Creamer, D., Higgins, E., & Weinman, J. (2004). Perceived stress, stress attributions and psychological distress in psoriasis. *Journal of Psychosomatic Research*, 57, 465-471.

Riemann, D. & Perlis, M.L. (2009). The treatments of chronic insomnia: A review of benzodiazepine receptor agonists and psychological and behavioral therapies. *Sleep Medicine Reviews*, 13, 205-214.

Thorburn, P.T. & Riha, R.L. (2010). Skin disorders and sleep in adults: Where is the evidence? *Sleep Medicine Reviews*, 14, 351-358.

Thorsteinsson, E.B., Brown, R.F., Owens, M.T. (2019). Modeling the effects of stress, anxiety, and depression on rumination, sleep, and fatigue in a nonclinical sample. *The Journal of Nervous and Mental Disease*, 207, 355-359.

Wang, Z., Xie, H., Gong, Y., Ouyang, Y., Deng, F., Tang, Y., Li, J. (2020). Relationship between rosacea and sleep. *Journal of Dermatology*, 47, 592-600.

Woodruff, P., Higgins, E., Du Vivier, A., & Wessely, S. (1997). Psychiatric illness in patients referred to a dermatology-psychiatry clinic. *General Hospital Psychiatry*, 19, 29-35.