Journal of Cognitive and Behavioral Psychotherapies,
Vol. 10, No. 1, March 2010, 1-12.

SLEEP BELIEFS, SUBJECTIVE SLEEP QUALITY AND DIURNAL PREFERENCE – FINDINGS FROM DEPRESSED PATIENTS

Bogdan I. VOINESCU[*1], *Andrew N. COOGAN*[2], *Remus ORĂSAN*[1]

[1]Iuliu Hatieganu University of Medicine and Pharmacy, Cluj-Napoca, Romania
[2] National University of Ireland, Maynooth, Kilkenny, Ireland

Abstract

This study evaluated the relationship between dysfunctional sleep beliefs, circadian typology and self-reported sleep quality and insomnia. We assessed these parameters both in healthy controls and patients with depression. One hundred eighty six subjects were assessed and completed measures of sleep beliefs, sleep disturbance, sleep quality, daytime sleepiness, depressive symptoms and circadian typology. We found that sleep beliefs are slightly linked with the subjective sleep quality, but with neither the diurnal preference, nor the self-reported insomnia.

Keywords*:* sleep quality, sleep beliefs, diurnal preferences, depression

In modern society, sleep problems are common, occurring in up to a third of the general population worldwide (Ohayon, 2002). Several risk factors for poor sleep quality have been identified, amongst which are: sleep hygiene and dysfunctional attitudes and beliefs towards sleep (Ohayon, 2002; Roth, 2007). It has been reported that more positive sleep beliefs and attitudes are associated with better sleep quality (Brown, Buboltz, & Soper, 2002; Gellis & Lichstein, 2009; Jansson & Linton, 2007; Morin, Blais, & Savard, 2002). However, insomniacs show superior appreciation of sleep hygiene, but still maintain poorer sleep practices than good sleepers (Carney, Edinger, Manber, Garson, & Segal, 2007; Gallasch & Gradisar, 2007; Gellis & Lichstein, 2009; Kohn & Espie, 2005). It has been hypothesized that poor sleepers either do not find sleep hygiene useful, or do not persist with it (Gallasch & Gradisar, 2007). Further, poor sleepers display higher levels of mental arousal, itself a known risk factor for insomnia (Kohn & Espie, 2005).

Other attempts to reveal risk factors for insomnia have focused on individual differences, such as age, gender, marital status, income, education and occupational status (Ohayon, 2002). One such factor that has been shown to significantly influence sleep quality is diurnal preference, the attribute of the

[*] Correspondence concerning this article should be addressed to:
E-mail: bogdan.voinescu@gmail.com

human circadian system determining whether individuals are optimally alert and active early or late in the day (Chung, Chang, Yang, Kuo, & Hsu, 2009; Mongrain, Carrier, & Dumont, 2005; Taillard, Philip, & Bioulac, 1999). Recently, an international study revealed that diurnal preference influences sleep hygiene, as those with an evening orientation display more maladaptive sleep beliefs (Adan, Fabbri, Natale, & Prat, 2006). However, the relationship between chronotype and sleep beliefs has only been studied on the healthy population, with no data available to date on the potential influence of disease on this interplay.

Sleep disturbance is a symptom of many medical or psychiatric disorders, being a classic finding in the assessment of the depression. There is strong evidence that pre-existing insomnia contributes greatly to the course and severity of depressive disorders and even predicts relapse or poor outcome (Franzen & Buysse, 2008; Srinivasan, et al., 2009). The management of insomnia has been dramatically affected by the understanding of its psychopathogenesis, such that, currently, first line treatments are cognitive and behavioral interventions, with pharmacotherapy representing a second line approach.

The detection of the dysfunctional sleep beliefs, together with assessing behaviors inconducive to sleep, might help in better understanding the role of sleep beliefs and sleep hygiene in relation to insomnia. This study focuses on evaluating the relation between dysfunctional sleep beliefs, diurnal preference, subjective sleep quality and self-reported insomnia in depressed patients compared to healthy controls. We hypothesized that dysfunctional sleep beliefs would be more prevalent among the poor sleepers and evening chronotypes.

Method

Participants

The study was approved by the Ethics Committee of "Iuliu Ha□ieganu" Medicine and Pharmacy University, Cluj-Napoca, Romania. We recruited the participants from adults presenting at the GP or psychiatrist, as well as from their acquaintances. The diagnosis of a depressive disorder was made based on ICD-10 criteria. Those suffering from other major conditions that affect sleep, such as cardiac (severe heart failure, unstable angina), dermatologic (psoriasis), gastrointestinal (inflammatory bowel disease), neurologic (stroke, Parkinson's disease, epilepsy, traumatic brain injury), pulmonary (obstructive sleep apnea, persistent asthma, chronic obstructive pulmonary disease), psychiatric (chronic or acute psychosis, bipolar disorder, dementia, mental retardation), endocrine (hypo- or hyperthyroidism) or rheumatologic disorders were excluded from the study.

Our sample consisted of 207 subjects, aged over 18. Twenty one subjects failed to complete the sleep beliefs scale and were not included in the analysis. Based on the presence of the diagnosis of current depressive episode or dysthymia, the participants were divided into two groups: healthy and depressed. The "healthy"

group consisted of 131 individuals with a mean age of 41.9±12.5 years, of which 50.4% (n=66) were men. The depression group consisted of 55 subjects, mostly women (n=28; 50.9%); the mean age was 45.6±16.4.

Measures

A questionnaire set containing the Romanian translation of *the Sleep Beliefs Scale* (Adan, et al., 2006) 2006) *the Sleep Disturbance Questionnaire* (Violani, Devoto, Lucidi, Lombardo, & Russo, 2004), *the Pittsburgh Sleep Quality Index* (Buysse, Reynolds, Monk, Berman S.R., & Kupfer, 1989), *the Epworth Sleepiness Scale* (Johns, 1991) and *the Beck Depression Inventory II* (Beck, Steer, Ball, & Ranieri, 1996) was used. The first two scales had to be translated into Romanian. They were then back translated into English by two bilingual Romanian-English speakers to ensure fidelity of translation. The other three instruments have already been translated and validated on the Romanian population.

The Sleep Beliefs Scale (SBS) is based on the Sleep Hygiene Awareness and Practice Scale (Lacks & Rotert, 1986). It contains 20 items and explores the knowledge of the subject about the influences of substance use, behaviors, activities and thoughts on sleep. The answers are related to the subjects' beliefs and not to their behavior. Correct answers all indicate beliefs that describe behaviors deleterious to sleep, with the exception of 4 items (where the answer should be positive). The total scores range from 0 to 20, with higher scores indicating more correct beliefs (Adan, et al., 2006).

The Composite Scale of Morningness (CSM) contains 13 questions, most of them having four choices, with a Likert-type response format and total scores range from 13 (extreme eveningness) to 55 (extreme morningness) (C. S. Smith, Reilly, & Midkiff, 1989). We used the cut-off scores determined by age groups on the 25/75 percentiles (Voinescu, Coogan, & Orăsan, 2009).

The Sleep Disturbance Questionnaire (SDQ) is a self-rating questionnaire with 18 questions on different sleep problems. It evaluates the presence of a sleep disorder (i.e., insomnia, excessive sleepiness, sleep apnea and parasomnias) in the last month and investigates the duration, frequency and consequences of the problem. The SDQ allows the investigator to divide the subjects into three main categories: subjects who do not complain of insomnia disorder, subjects who report the occurrence of insomnia problems without satisfying the DSM-IV and ICSD criteria and subjects whose symptoms meet DSM-IV and ICSD criteria for insomnia (Violani, et al., 2004).

The Pittsburgh Sleep Quality Index (PSQI) is a widely used self-rated, 18-item questionnaire that generates seven component scores, ranging from subscale scores 0 to 3: sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medications and daytime dysfunction. The global score ranges from 0 to 21; a higher score is indicative of poorer subjective sleep quality (Buysse, et al., 1989). Although the original authors

recommended a lower cut-off score of 5 in order to divide the subjects into poor and good sleepers, the latest research data suggests that a higher score of 7 provides better sensibility and sensitivity in detecting clinically significant insomnia (Gallasch & Gradisar, 2007; Gellis & Lichstein, 2009).

Used together with the PSQI, *the Epworth Sleepiness Scale* (ESS) is a simple, self-administered questionnaire that provides a measurement of the subject's general level of daytime sleepiness. It rates the chances that the subject would doze off or fall asleep when in eight different situations, commonly encountered in daily life (Johns, 1991).

The Beck Depression Inventory II is an instrument used for measuring the severity of depression. It is composed of 21 items relating to symptoms of depression, each of which consists of four self-evaluative statements scored 0 to 3. Responses are summed to yield a total score that ranges from 0 to 63 (Beck, et al., 1996).

Procedure

Participation was voluntary and anonymous. Patients, not meeting the exclusion criteria, received an invitation letter from their GP or psychiatrist. The letter explained the nature of research and the ethical requirements for confidentiality. If willing, they were given the scales to be completed. They were also asked to further recruit adult participants from their acquaintances (snowball sampling). Completing the survey was considered implied consent to participate in this study. The data in the present study were collected in a wider investigation, where a thorough battery of self-assessment questionnaires was applied.

Statistical analysis

The reliability of the scales was estimated by Cronbach's α coefficient and by principal component analysis. Total scores are expressed as means and standard deviations (SD). To examine inferential statistical significance, Mann-Whitney's U and Kruskal-Wallis' H tests were used, as the data were not normally distributed. To evaluate the interrelationships of various characteristics, we used the Pearson's Chi Square test. Spearman's rho was used for calculating correlations between variables. $p<.05$ was considered significant. Data analysis was performed using the SPSS (version 16.0.2).

Results

Reliability of the Sleep Beliefs Scale

The Cronbach's α coefficient of the SBS was .660 for the whole sample. Corrected item-total correlation ranged from .05 to .39 with a median correlation of .23. Items 15 (Getting up when it is difficult to fall asleep) and 20 (Recovering lost sleep by sleeping for a long time) had the lowest correlation with the total scores (.05) and the strongest effect on α coefficient if deleted (.66).

Principal component analysis was performed using the orthogonal rotation (varimax) method. The Kaiser-Meyer-Olkin measure of sampling adequacy was .671 and all KMO values for individual items were >.55, above the acceptable limit of .50. Bartlett's test of sphericity $\chi^2(190)=649.87$, $p<.05$, indicated that correlations between items were sufficiently large for the analysis. Three components had eigenvalues over 1.5 and in combination, they explained 29.88% of the variance (F1=13.81%, F2=8.42%, F3=7.63%). The factor loadings and the item assignment are presented in Table 1.

Table 1. SBS factor loadings after rotation. Items in bold identify the factor to which the item was assigned

Rotated Component Matrix	**Component 1**	**Component 2**	**Component 3**
Item 07	**.65**	.07	-.03
Item 08	**.62**	-.11	-.01
Item 01	**.56**	-.16	-.06
Item 02	**.42**	-.08	.12
Item 12	**.42**	.27	.17
Item 10	**.42**	.35	.05
Item 14	**.39**	.09	.19
Item 17	**.30**	.13	.27
Item 16	-.08	**.68**	.12
Item 13	-.05	**.61**	.20
Item 04	.11	**.48**	-.03
Item 06	.07	**.38**	.12
Item 11	.07	**.36**	-.14
Item 15	-.13	**.30**	.02
Item 19	.04	.04	**.74**
Item 05	.26	.15	**.55**
Item 09	.04	.05	**.50**
Item 18	.34	.16	**.47**
Item 20	.06	.34	**-.37**
Item 03	.28	.26	**-.36**

Descriptive Statistics

Most of the respondents came from urban areas (n=136, 73.1%) and had a university degree (n=75, 40.3%). In terms of gender, both of the groups had an almost 1:1 distribution. There were no significant age differences among the participants.

As Table 2 shows, mean SBS scores were very close among the groups. Depressed patients scored significantly higher ($p<.05$) both in the PSQI, BDI and ESS. No significant differences in mean SBS scores were found when taking into account the participants' age, gender, educational level or provenience.

Table 2. Participant characteristics

	Healthy	**Depressed**	**Total**	**Mann-Whitney U**
Age	41.98±12.55	45.64±16.38	43.05±13.83	Z=-1.53
SBS	11.88±3.45	11.76±3.01	11.84±3.32	Z=-.30
PSQI	4.59±2.95	8.63±3.52	5.79±3.62	Z=-6.84*
BDI	4.08±7.25	25.81±9.51	10.51±12.73	Z=-10.44*
ESS	6.58±4.58	9.16±4.74	7.34±4.05	Z=-3.02*

*p<.05

As described by the PSQI and the SDQ, insomnia and poor quality sleep were significantly more prevalent among the depressed group ($p<.05$), where 65.5% (n=36) were poor sleepers and 58.2% (n=32) met the criteria for insomnia as a disease (for more details, see Table 3).

Table 3. Distribution of sleep disturbance

		Healthy	**Depressed**	**Pearson's Chi-Square**
Insomnia (% group)	No Symptoms	99 (75.6)	20 (36.4)	X=33.90*
	Disease	11 (8.4)	3 (5.5)	
		21 (16.0)	32(58.2)	
PSQI (% group)	Good Sleepers	103 (78.6)	19 (34.5)	X=26.36*
	Poor Sleepers	28 (21.4)	36 (65.5)	

*p<.05

Relation between Sleep Beliefs and Sleep

Most of the participants identified drinking coffee (n=157, 84.4%), eating late (n=146, 78.5%), working intensely until late night (n=147, 79.0%) or worrying about not sleeping enough (n=137, 73.7%) as main factors that impair sleep. On the opposite side, going to bed and arising at regular hours (n=143, 76.9%) or sleeping in a quiet and dark environment (n=154, 82.8%) were most frequently cited as beneficial for sleep. Recovering lost sleep by sleeping longer times (n=157, 84.4%) or doing intense physical exercise before going to bed (n=139, 74.7%) were most frequently misidentified as not being to the detriment of sleep. Similarly, getting up upon difficulty falling asleep (n=39, 21.0%) was

rarely considered to have a positive effect on sleep. No significant differences were found among the groups.

As related to good/ poor sleeper status allocated on PSQI scores, the good sleepers showed better sleep beliefs (12.41±3.14) compared to poor sleepers (11.25±3.10), with the difference being significant (Z=-2.24, p<.05). Poor sleepers in the control group had significantly more dysfunctional sleep beliefs than good sleepers (Z=-2.69, p<.05), whereas in the depressed group no significant differences were observed between the two categories (Table 4). We found no statistically significant differences in sleep beliefs based on the self-reported insomnia or chronotype.

Table 4. SBS scores by poor/good sleepers, insomnia diagnosis and chronotype

	Healthy	**Depression**	**Total Sample**
Good Sleepers	12.47±3.15	11.68±3.28	12.41±3.14
Poor Sleepers	10.07±3.17	11.80±2.91	11.25±3.10
Mann U Whitney Z	**-2.69***	-.05	**-2.24***
No Insomnia	11.74±3.59	12.10±3.30	12.00±3.32
Insomnia Symptoms	12.63±3.10	13.33±2.30	12.78±2.88
Insomnia Disease	12.14±3.02	11.40±2.89	11.69±2.93
Kruskal-Wallis X	.39	1.08	.95
Morning	12.55±3.16	11.10±3.35	12.30±3.07
Evening	12.08±3.79	11.80±2.83	12.02±3.29
Neither	11.40±3.39	12.00±3.30	11.77±3.17
Kruskal-Wallis X	2.03	.61	1.00

*p<.05

There was a significant relation between sleep beliefs and sleep duration, sleep latency, sleep efficiency and sleep quality PSQI sub-scores. Factor 1 of the SBS was also significantly related to sleep duration, while Factor 2 to daytime sleepiness. Factor 3 was significantly related to sleep efficiency, daytime sleepiness and depressive symptoms. In all the aforementioned relations, the correlation was rather low (Table 5).

Total BDI scores were significantly and moderately related to the total PSQI scores (rho=.62, p<.05) and slightly to the Epworth ones (rho=.26, p<.05). As related to individual items of the SBS, trying to fall asleep without having a sleep sensation was significantly linked with sleep disturbance and sleep duration, while worries about insufficient sleep to sleep efficiency and quality (Table 6).

Table 5. **Rho scores for correlation of SBS and sleep properties**

	SBS score	**Factor 1**	**Factor 2**	**Factor 3**
ESS	-.06	-.02	**-.22***	**-.26***
Sleep Duration	**-.15***	**-.13***	-.11	-.05
Sleep Latency	**-.14***	-.12	-.08	-.01
Sleep Efficiency	**-.16***	-.09	-.06	**-.16***
Sleep Quality	**-.17***	-.11	-.12	-.01
BDI	-.04	-.04	-.07	**-.13***

*p<.05

Table 6. Rho scores for SBS item correlation with PSQI, BDI and ESS

	PSQI	**BDI**	**ESS**	**Sleep Duration**	**Sleep Disturbance**	**Sleep Latency**	**Sleep Efficiency**	**Sleep Quality**
1. Drinking alcohol in the evening	-.01	**.12***	.05	-.12	-.07	-.06	-.03	-.06
3. Doing intense physical exercise before going to bed	**-.09***	-.06	**-.09***	-.02	-.004	-.06	-.05	**-.12***
7. Using sleep medication regularly	-.07	-.12	**-.19***	-.08	**-.19***	-.09	-.03	**-.15***
13. Trying to fall asleep without having asleep sensation	.07	.10	.04	**-.26***	**.21***	-.002	-.04	-.06
15. Getting up when it is difficult to fall asleep	-.01	**-.14***	**-.13***	.01	-.06	-.06	-.04	-.08
17.Going to bed immediately after eating	.02	.07	.01	-.03	.06	-.02	**.10***	.04
18. Being worried about the impossibility of getting enough sleep	-.03	-.09	.06	-.05	-.02	-.08	**-.22***	**-.18***
19. Sleeping in a quiet and dark room	-.004	.02	**.17***	-.04	-.04	**-.15***	**-.21***	-.04
2. Recovering lost sleep by sleeping for a long time	.04	.01	**-.14***	.10	.03	-.04	.10	.02

*p<.05

Discussion and conclusions

The present study aimed to explore the relation of sleep quality to dysfunctional sleep beliefs and circadian typology, in healthy adults and patients diagnosed with depression. Overall, we found that sleep beliefs are slightly linked with the subjective sleep quality; neither chronotype, nor self-reported insomnia were found to be associated with the sleep beliefs in these populations.

Compared to the Italian and Spanish versions (Adan, et al., 2006), the Romanian SBS had comparable internal consistency and construct validity. Most of the sleep deterring beliefs or behaviors were correctly identified, both in the clinical and non-clinical groups. As in the previously published data, drinking coffee was most frequently identified to have a negative effect on sleep, while sleeping in a quiet and dark room was the most frequently indentified positive influence.

One of the most striking results of the present research is that neither gender, nor age or diurnal preference is related to the correctness of sleep beliefs. There is only one published study that concluded that the evening types are more prone to having worse sleep hygiene and beliefs (Adan, et al., 2006). This difference may arise due to different diurnal preference scales (reduced morningness-eveningness scale questionnaire (rMEQ) in Adan et al, 2006 vs. CSM in the current study, (Caci, Deschaux, Adan, & Natale, 2009). Moreover, their research sample consisted only of healthy students. We, therefore, question the hypothesis that sleep beliefs are related to chronotype in a more disparate population.

Dysfunctional sleep beliefs were found to be significantly linked with several sleep parameters, but the correlation was rather low. This finding is consistent to published data suggesting that sleep education may not be effective in improving sleep (Gallasch & Gradisar, 2007). Although insomniacs were reported to have better sleep beliefs (Gellis & Lichstein, 2009), we found no differences among the groups examined in this study. Therefore, we postulate that dysfunctional sleep beliefs are unlikely to be primary cause of sleep disturbance.

There are a number of limitations that influence our interpretation of the current data set. No biological markers were used in this study and diurnal preference, severity of depression, as well as sleep and sleep loss consequences were self-assessed with psychological instruments that are not as reliable as objective measurements. Therefore, total scores can be exaggerated or minimized by the person completing them. Moreover, the number of patients recruited was rather limited. As the sample responding the questionnaire was self-selected, it was not possible to calculate a response rate or comment on the characteristics of those who chose not to take part.

Understanding the impact of sleep beliefs on the quality of sleep is of obvious importance in appreciating the genesis and maintenance of insomnia, as

well as for constructing effective cognitive interventions (Gallasch & Gradisar, 2007; Jansson-Frojmark & Linton, 2008; Montserrat Sanchez-Ortuno & Edinger, 2009). For many individuals, non-pharmacological treatment in the form of the cognitive-behavioral therapy (CBT) proves to be the most effective and appropriate intervention for chronic insomnia (Morin, et al., 2009; Perlis, Smith, Cacialli, Nowakowski, & Orff, 2003; M. T. Smith, et al., 2002; Wu, Bao, Zhang, Deng, & Long, 2006). Such therapy usually consists of four to eight 60- to 90-minutes long sessions in which patients are educated about good sleep practices, modifying maladaptive coping mechanisms, reducing hyperarousal states and resolving misconceptions about sleep. Although CBT takes more time to be implemented than pharmacotherapy (weeks vs. days), published data suggest it produces more sustained benefits over time in persistent insomnia (Morin, et al., 2009; Wu, et al., 2006) or sleep initiation difficulties (Perlis, et al., 2003) and also produces similar results when used for a short-time (M. T. Smith, et al., 2002). In a recently published study, cognitive-behavioral therapy (CBT) alone was found to be more effective and cost-efficient than CBT in combination with medication (i.e., Zolpidem) or than the same medication used alone (Morin, et al., 2009). About 60% of the participants achieved therapeutic responses after 6 weeks and the rates were similar after 6 months of treatment. Nevertheless, it is still debatable whether CBT or medication should be used as first-line therapy for insomnia or whether assessing sleep beliefs or sleep hygiene might be useful for particular therapeutic groups under CBT. Further research should focus on the implications of sleep dysfunctional beliefs in the management of insomnia.

Acknowledgements
We are thankful to all the physicians involved in the recruitment of the participants, particularly to those from the Hospital of Infectious Diseases, Dermatovenerology and Psychiatry and the Laboratory of Mental Health, in Baia Mare, Romania.

REFERENCES

Adan, A., Fabbri, M., Natale, V., & Prat, G. (2006). Sleep Beliefs Scale (SBS) and circadian typology. *Journal of Sleep Research, 15*, 125-132.

Beck, A. T., Steer, R. A., Ball, R., & Ranieri, W. (1996). Comparison of Beck Depression Inventories -IA and -II in psychiatric outpatients. *Journal of Personality Assessment, 67*, 588-597.

Brown, F. C., Buboltz, W. C., Jr., & Soper, B. (2002). Relationship of sleep hygiene awareness, sleep hygiene practices, and sleep quality in university students. *Behavioral Medicine, 28*, 33-38.

Buysse, D. J., Reynolds, C. F., Monk, T. H., Berman S.R., & Kupfer, D. J. (1989). The Pittsburgh Sleep Quality Index (PSQI): A new instrument for psychiatric research and practice. *Psychiatry Research, 28*, 193-213.

Caci, H., Deschaux, O., Adan, A., & Natale, V. (2009). Comparing three morningness scales: Age and gender effects, structure and cut-off criteria. *Sleep Medicine, 10*, 240-245.

Carney, C. E., Edinger, J. D., Manber, R., Garson, C., & Segal, Z. V. (2007). Beliefs about sleep in disorders characterized by sleep and mood disturbance. *Journal of Psychosomatic Research, 62*, 179-188.

Chung, M. H., Chang, F. M., Yang, C. C., Kuo, T. B., & Hsu, N. (2009). Sleep quality and morningness-eveningness of shift nurses. *Journal of Clinical Nursing, 18*, 279-284.

Franzen, P. L., & Buysse, D. J. (2008). Sleep disturbances and depression: risk relationships for subsequent depression and therapeutic implications. *Dialogues in Clinical Neurosciences, 10*, 473-481.

Gallasch, J., & Gradisar, M. (2007). Relationships between sleep knowledge, sleep practice and sleep quality. *Sleep and Biological Rhythms, 5*, 63-73.

Gellis, L. A., & Lichstein, K. L. (2009). Sleep Hygiene Practices of Good and Poor Sleepers in the United States: An Internet-Based Study. *Behavior Therapy, 40*, 1-9.

Jansson-Frojmark, M., & Linton, S. J. (2008). The role of sleep-related beliefs to improvement in early cognitive behavioral therapy for insomnia. *Cognitive Behaviour Therapy, 37*, 5-13.

Jansson, M., & Linton, S. J. (2007). Psychological mechanisms in the maintenance of insomnia: arousal, distress, and sleep-related beliefs. *Behaviour Research and Therapy, 45*, 511-521.

Johns, M. W. (1991). A new method for measuring daytime sleepiness: the Epworth sleepiness scale. *Sleep, 14*, 540-545.

Kohn, L., & Espie, C. A. (2005). Sensitivity and specificity of measures of the insomnia experience: a comparative study of psychophysiologic insomnia, insomnia associated with mental disorder and good sleepers. *Sleep, 28*, 104-112.

Lacks, P., & Rotert, M. (1986). Knowledge and practice of sleep hygiene techniques in insomniacs and good sleepers. *Behaviour Research and Therapy, 24*, 365-368.

Mongrain, V., Carrier, J., & Dumont, M. (2005). Chronotype and sex effects on sleep architecture and quantitative sleep EEG in healthy young adults. *Sleep, 28*, 819-827.

Montserrat Sanchez-Ortuno, M., & Edinger, J. D. (2009). A penny for your thoughts: Patterns of sleep-related beliefs, insomnia symptoms and treatment outcome. *Behaviour Research and Therapy, 48,* 125-133.

Morin, C. M., Blais, F., & Savard, J. (2002). Are changes in beliefs and attitudes about sleep related to sleep improvements in the treatment of insomnia? *Behaviour Research and Therapy, 40*, 741-752.

Morin, C. M., Vallieres, A., Guay, B., Ivers, H., Savard, J., Merette, C., et al. (2009). Cognitive behavioral therapy, singly and combined with medication, for persistent insomnia: a randomized controlled trial. *JAMA, 301*, 2005-2015.

Ohayon, M. M. (2002). Epidemiology of insomnia: what we know and what we still need to learn. *Sleep Medicine Reviews, 6*, 97-111.

Perlis, M. L., Smith, M. T., Cacialli, D. O., Nowakowski, S., & Orff, H. (2003). On the comparability of pharmacotherapy and behavior therapy for chronic insomnia. Commentary and implications. *Journal of Psychosomatic Research, 54*, 51-59.

Roth, T. (2007). Insomnia: definition, prevalence, etiology, and consequences. *Journal of Clinical Sleep Medicine, 3*(5 Suppl), S7-10.

Smith, C. S., Reilly, C., & Midkiff, K. (1989). Evaluation of three circadian rhythm questionnaires with suggestions for an improved measure of morningness. *Journal of Applied Psychology, 74*, 728-738.

Smith, M. T., Perlis, M. L., Park, A., Smith, M. S., Pennington, J., Giles, D. E., et al. (2002). Comparative Meta-Analysis of Pharmacotherapy and Behavior Therapy for Persistent Insomnia. *The American Journal of Psychiatry, 159*, 5-11.

Srinivasan, V., Pandi-Perumal, S. R., Trakht, I., Spence, D. W., Hardeland, R., Poeggeler, B., et al. (2009). Pathophysiology of depression: role of sleep and the melatonergic system. *Psychiatry Research, 165*, 201-214.

Taillard, J., Philip, P., & Bioulac, B. (1999). Morningness/eveningness and the need for sleep. *Journal of Sleep Research, 8*, 291-295.

Violani, C., Devoto, A., Lucidi, F., Lombardo, C., & Russo, P. M. (2004). Validity of a Short Insomnia Questionnaire: the SDQ. *Brain Research Bulletin, 63*, 415–421.

Voinescu, B. I., Coogan, A. N., & Orăsan, R. (submitted). Psychometric Properties of the Romanian Translation of the Composite Scale of Morningness in Healthy Adults.

Wu, R., Bao, J., Zhang, C., Deng, J., & Long, C. (2006). Comparison of Sleep Condition and Sleep-Related Psychological Activity after Cognitive-Behavior and Pharmacological Therapy for Chronic Insomnia. *Psychotherapy and Psychosomatics, 75*, 220-228.