

A COGNITIVE MODEL OF INSOMNIA

CATHERINE FICHTEN: DAWSON COLLEGE & SMBD - JEWISH GENERAL HOSPITAL
WILLIAM BRENDER, LAURA CRETİ, EVA LIBMAN: CONCORDIA UNIVERSITY & SMBD - JEWISH GENERAL HOSPITAL
VICKI TAGALAKIS: DAWSON COLLEGE, RHONDA AMSEL: MCGILL UNIVERSITY
SALLY BAILES: SMBD - JEWISH GENERAL HOSPITAL

ABSTRACT

The frequency of poor sleep increases with age. Yet, not all poor sleepers complain of insomnia. Our Cognitive Model of Insomnia predicts that sleep complaints in poor sleepers are a function of negative thinking during nocturnal wakefulness. To test the Model, we examined thoughts of two large samples of older individuals. Results support the model: negative thoughts were closely related to poor sleep, distress about insomnia, and poor daytime psychological adjustment. The implications for therapeutic intervention are discussed.

INTRODUCTION

There are a host of age related changes in sleep and wakefulness; all are in the direction of impaired sleep (Morin, 1993). Even healthy older adults generally experience a reduction in deep sleep, increased nighttime wakefulness, more frequent early morning awakenings, and increased fragmentation of sleep; there is also some reduction in deep sleep, rapid-eye movement (REM) sleep, and total nighttime sleep (Prinz, Vitello, Raskind, & Thorpy, 1990).

Despite such developmental psychophysiological changes in sleep patterns, not all older adults complain of impaired sleep. Studies have shown that there are individuals who manifest fairly severe disorders of initiating and/or maintaining sleep (DIMS), but are minimally or not at all distressed by this (Dement, Miles, & Carskadon 1982; Fichten, Creti, Amsel, Brender, Weinstein, & Libman, 1995; Lichstein & Rosenthal, 1980; Monjan, 1990; Seidel, Ball, Cohen, Patterson, Yost, & Dement, 1984; Stepanski, Koshorek, Zorick, Glinn, Roehrs, & Roth, 1989). Other studies have demonstrated the opposite; namely that the relatively small amount of sleep deprivation in many insomniacs cannot account for the magnitude of their complaints (e.g., Chambers & Keller, 1993).

KEY QUESTIONS

These discrepant conclusions raise the following three questions: (1) Why do some older individuals not complain, even when they experience fairly severe sleep dis-

ruptions? (2) Why do others complain of insomnia when sleep disruption is minimal? and (3) If sleep disruption is a necessary but not sufficient condition, which is only variably related to the insomnia complaint, what are the other contributing factors?

When we used these questions to guide our earlier studies, we were able to identify four distinct groups of individuals. There were the expected three groups: good sleepers with no complaints, poor sleepers who were highly distressed by their insomnia, and "medium quality" sleepers - people whose sleep was neither really good nor really poor. However, we also found that there was an additional reasonably large group of very poor sleepers; these people manifested fairly severe DIMS but were minimally or not at all distressed by this (Fichten, Creti, Amsel, Brender, Weinstein, & Libman, 1995).

We found that almost half of our older participants could be classified as good sleepers; they neither experienced nor were troubled by poor sleep (Libman, Creti, Amsel, Brender, & Fichten, 1997). When various sleep parameters were examined more closely, these individuals indeed appeared to sleep longer and to manifest substantially less frequent and severe sleep disruptions than people diagnosed as poor sleepers. What our findings also showed was that in addition to having good sleep, these fortunate individuals were also conspicuously free of psychological maladjustment (although they did not demonstrate the presence of especially good adjustment (Lavidor, Libman, Babkoff, Creti, Weller, Amsel, Brender, & Fichten, 1996; Fichten et al., 1995).

Poor sleepers in our samples experienced considerably worse sleep than good sleepers on "objective" aspects - total sleep time, total wake time, and sleep efficiency. Poor sleepers reporting high and low distress about the problem were fairly similar on severity as well as duration of the problem (Fichten, Libman, Creti, Amsel, Tagalakis, & Brender, W., 1997). However, on both trait and state measures of psychological maladjustment and negative adaptation, it was frequently the good sleepers and the minimally distressed poor sleepers who were similar in their low levels of anxiety and maladjustment, in compari-

son to those who were highly distressed about their sleep problem (Fichten et al., 1995).

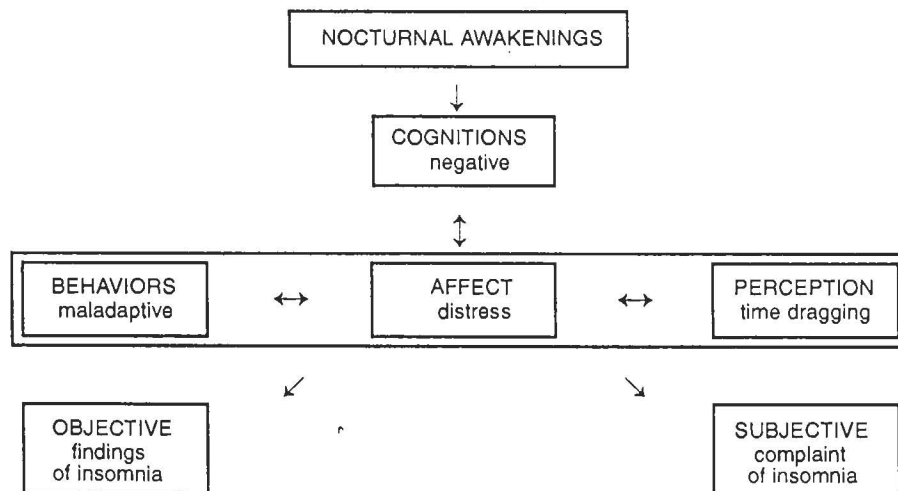
The finding of poorer psychological adjustment in healthy older adults with insomnia is similar to results reported by others (e.g., Gourash Bliwise, 1992; Morgan, Healey, & Healey, 1989; Morin & Gramling, 1989). What is unique in our findings is (a) the clear demonstration that substantial numbers of older poor sleepers who are not distressed by their sleep disorder exist, and (b) the description of their characteristics, which had not been evaluated prior to our work. Our findings show that low distress poor sleepers differ from those who are highly distressed not in that they experience less problematic sleep, nor, as our findings on lifestyle factors attest, in that they lead more regular or stress free lives. What distinguishes them is that, unlike their highly distressed peers, low distress poor sleepers **do not manifest poor psychological adjustment**. This is similar to what we observed in older good sleepers. People in this low distress poor sleeper category appear to represent a poorly documented but substantial segment of the aging population: those who are coping well with the psychophysiological changes in sleep architecture which typically accompany the aging process.

COGNITIVE MODEL OF INSOMNIA

In a series of studies on good sleepers and on minimally and highly distressed poor sleepers we explored the mechanisms by which psychological maladjustment is related to the **complaint** of insomnia, as opposed to the mere presence of DIMS (Creti, Libman, & Fichten, 1997; Fichten et al., 1995; Fichten, Alapin, Olders, & Libman, 1997; Fichten, Libman, Creti, Amsel, Tagalakis, & Brender,

1997; Fichten, Creti, Bailes, Weinstein, Tagalakis, Amsel, Brender, & Libman, 1997; Libman, Creti, Amsel, Brender, & Fichten, 1997; Libman, Creti, Levy, Brender, & Fichten, in press; Libman, Fichten, Weinstein, Tagalakis, Amsel, Brender, & Creti, in press).

Specifically, prior to our studies, there had been no systematic investigation of thinking during nocturnal awake times and little explicit recognition of the role of cognitive factors in insomnia complaints, even though sleep researchers and clinicians have long implicated cognitive hyperarousal and distressing and intrusive thoughts in the etiology and maintenance of insomnia (Borkovec, Lane, & Van Oot, 1981; Coyle & Watts, 1991; Kuisk, Bertelson, & Walsh, 1989; Lichstein & Fanning, 1990; Lundh, Lunqvist, Broman, & Hetta, 1991; Morin, 1993). The literature shows that younger good and poor sleepers can be distinguished on the basis of their thought content during the day (Marchini, Coates, Magistad, & Waldum, 1983; Van Egeren, Haynes, Franzen, & Hamilton, 1983). It has also been demonstrated that the addition of cognitive aspects to cognitive-behavioral interventions, such as changing maladaptive beliefs and attitudes about sleep, has beneficial effects on the complaint of insomnia (Morin, Kowatch, Barry, & Walton, 1993). Indeed, some have argued that a common mediating mechanism - interference with intrusive cognitive activity - can best explain the demonstrated effectiveness of a wide variety of cognitive-behavioral interventions in treating sleep problems (cf. Borkovec, 1982; Lacks, 1987; Lichstein & Fischer, 1985). Nevertheless, before our research, little was known about the nature or the content of thoughts experienced either by good or by poor sleepers when they are awake during the night.



Our model begins with the recognition that nocturnal awakenings will occur in most older individuals. It then proposes that negative cognitive activity, such as concerns about the day's events and worry about miscellaneous matters, including the consequences of not getting enough sleep, leads to other maladaptive nocturnal events which, in turn, both magnify the sleep complaint as well as contribute to the negative cognitive experiences which interfere with falling asleep or returning to sleep. The model predicts that interference with negative thoughts is likely to be effective because this eliminates cognitive activities which (1) prevent sleep, (2) cause negative affect, (3) result in maladaptive sleep related behaviors, and (4) contribute to distorted perceptions of the passage of time.

In support of the model, we demonstrated in a series of studies that people generally overestimate the duration of "empty" blocks of time, such as those experienced during periods of nocturnal wakefulness, and that they perceive empty time as "dragging" (Fichten, Creti, Bailes, Weinstein, Tagalakis, Amsel, Brender, & Libman, 1997). We also found that poor sleepers report that they engage in a large variety of sleep related behaviors, many of which are maladaptive (e.g., tossing and turning: Libman, Creti, Amsel, Brender, & Fichten, 1997). In addition, numerous studies have shown that individuals who complain of insomnia experience more negative affect and have poorer daytime psychological adjustment than good sleepers (e.g., Gourash Bliwise, 1992; Morin & Gramling, 1989; Morgan, Healey, & Healey, 1989). It has also been shown that the actual amount of sleep deprivation for insomnia complainers in many cases is of no great clinical significance (Chambers & Keller, 1993), and that they do not experience excessive daytime sleepiness (Lichstein, Wilson, Noe, Aguillard, & Nellur, 1994). Our model proposes that nocturnal negative thoughts and self-statements provide the mediational mechanism by which poor daytime adjustment influences the insomnia experience and nocturnal distress.

To test the Model, we also examined the content and valence of thoughts listed or endorsed by 605 older adults. We compared positive and negative thoughts reported by good sleepers and by two types of poor sleepers: those experiencing either high or low distress about their insomnia. Thought listing and inventory results both support the Model: our data indicate that negative thought frequencies were closely related to poor sleep, sleep disruption, distress about insomnia, and poor daytime psychological adjustment (Fichten, Libman, Creti, Amsel, Tagalakis, & Brender, in press; 1997).

IMPLICATIONS AND CONCLUSIONS

Our findings provide support for the Model and show that aversive cognitions, including negative thoughts, a poor balance between positive and negative thinking, and high levels of mental "tension" are all strongly and clearly related both to poor sleep and to distress about one's sleep problems. These cognitive aspects were more closely related to the various components of the insomnia experience than any of the state or trait measures of anxiety and adjustment, suggesting a mediational role for negative thinking during nocturnal awake times.

Whatever their source, negative thinking has a powerful impact on affect and behavior, as has been amply demonstrated in the vast cognitive therapy literature. Because effective techniques for altering negative thoughts are readily available, our findings have a variety of applied implications for the treatment of insomnia.

Nocturnal awakenings are to be expected as people grow older. Whether the older individual complains of insomnia appears to depend on the presence or absence of negative thoughts. As proposed by our Model, negative thoughts are likely to make nocturnal wakefulness unpleasant: they are associated with maladaptive behaviors, negative affect, and biased information processing, which probably interact to interfere with getting back to sleep.

The therapeutic approach clearly suggested by our data is to reduce negative thoughts and "tension" during nocturnal awakenings. This may be accomplished in a variety of ways. First, individuals may be taught to replace negative thoughts with neutral, "defusing," or positive thoughts and images. Second, people may be instructed to distract themselves (cf. Mathews & Milroy, 1994); this can be accomplished by refocusing attention away from the negatives by watching TV, reading, listening to the radio or to audiotapes with verbal content (Creti, Libman, & Fichten, 1997). Third, it is possible to interrupt negative thoughts by engaging in incompatible activities either in bed (e.g., relaxation exercises) or out of bed, as prescribed in Bootzin's popular stimulus control insomnia treatment (Bootzin, Epstein, & Wood, 1991). All of these techniques are described in our recently completed self-help manual (Libman & Fichten, 1996). Finally, our data also implicate daytime contributors to insomnia, including anxiety, tension, depression and an anxious, worrying personality style. This suggests that effective therapeutic intervention for insomnia might address the broader goal of modifying maladaptive daytime thoughts and feelings as well.

REFERENCES

- Bootzin, R.R., Epstein, D., & Wood, J.M. (1991). Stimulus control instructions. In P.J. Hauri (Ed.), **Case studies in insomnia** (pp.19-28). New York: Plenum.
- Borkovec, T.D. (1982). Insomnia. **Journal of Consulting and Clinical Psychology**, *50*, 880-895.
- Borkovec, T.D., Lane, T.W., & Van Oot, P.H. (1981). Phenomenology of sleep among insomniacs and good sleepers: Wakefulness experience when cortically asleep. **Journal of Abnormal Psychology**, *90*(6), 607-609.
- Chambers, M.J., & Keller, B. (1993). Alert insomniacs: Are they really sleep deprived? **Clinical Psychology Review**, *13*, 649-666.
- Creti, L., Libman, E., & Fichten, C.S. (1997). **Brief cognitive-behavioral interventions for insomnia in older individuals**. Manuscript in preparation.
- Coyle, K., & Watts, F. N. (1991). The factorial structure of sleep dissatisfaction. **Behavior Research and Therapy**, *29*, 513-520.
- Dement, W. C., Miles, L. E., & Carskadon, M. A. (1982). "White paper" on sleep and aging. **J. Am. Geriatric Soc.**, *30*, 25-50.
- Fichten, C.S., Creti, L., Amsel, R., Brender, W., Weinstein, N., & Libman, E. (1995). Poor sleepers who do not complain of insomnia: Myths and realities about psychological and lifestyle characteristics of older good and poor sleepers. **Journal of Behavioral Medicine**, *18*(2), 189-223.
- Fichten, C.S., Libman, E., Creti, L., Amsel, R., Tagalakis, V., & Brender, W. (1997). **Role of thoughts during nocturnal awake times in the insomnia experience of older adults**. Manuscript submitted for publication.
- Fichten, C.S., Creti, L., Bailes, S., Weinstein, N., Tagalakis, V., Amsel, R., Brender, W., & Libman, E. (1997). **Time estimation and the experience of insomnia**. Manuscript in preparation.
- Fichten, C.S., & Libman, E. (1991). L'insomnie et son traitement chez les personnes âgées: une nouvelle approche / A new look at the complaint of insomnia and its treatment in older adults. **Santé Mentale au Québec**, *16*(1), 99-116.
- Fichten, C.S., Alapin, I., Olders, H. & Libman, E. (1997). **Sleepiness, fatigue, and concentration problems: Are these due to sleep loss?** Manuscript in preparation for submission.
- Gourash Bliwise, N. (1992). Factors related to sleep quality in healthy elderly women. **Psychology and Aging**, *7*(1), 83-88.
- Kuisk, L. A., Bertelson, A. D., & Walsh, J. K. (1989). Presleep cognitive hyperarousal and affect as factors in objective and subjective insomnia. **Perceptual and Motor Skills**, *68*, 1219-1225.
- Lacks, P. (1987). **Behavioral treatment for persistent insomnia**. New York: Pergamon Press.
- Lavidor, M., Libman, E., Babkoff, H., Creti, L., Weller, A., Amsel, R., Brender, W., & Fichten, C.S. (1996). Psychologically laden sleep parameters in aging. Presentation at the Association for Advancement of Behavior Therapy, New York. Abstracted in **Convention proceedings for the 30th AABT annual convention**, 484.
- Libman, E., Creti, L., Amsel, R., Brender, W., & Fichten, C.S. (1997). What do older good and poor sleepers do during periods of nocturnal wakefulness? The Sleep Behaviors Scale: 60+. **Psychology and Aging**, *12*(1), 170-182.
- Libman, E., & Fichten, C.S. (1996). **Sleep, insomnia and aging - How to recognize a sleep problem and what to do about it**. [Manual - 68 pages]. Montreal: Sir Mortimer B. Davis - Jewish General Hospital. ISBN 2-9803316-2-7.
- Libman, E., Fichten, C.S., Weinstein, N., Tagalakis, V., Amsel, R., Brender, W., & Creti, L. (in press). Improvement and deterioration in sleep status of "younger" and "older" seniors: A longitudinal study. **Journal of Mental Health and Aging**.
- Libman, E., Creti, L., Levy, R.D., Brender, W. & Fichten, C.S. (in press). A comparison of reported and recorded sleep in older poor sleepers. **Journal of Clinical Geropsychology**.
- Lichstein, K.L., & Fanning, J. (1990). Cognitive anxiety in insomnia: An analogue test. **Stress Medicine**, *6*, 47-51.
- Lichstein, K.L., & Fischer, S.M. (1985). Insomnia. In M. Hersen & A.S. Bellack (Eds.), **Handbook of clinical behavior therapy with adults** (pp. 319-352). New York: Plenum.

- Lichstein, K.L., Wilson, N. M., Noe, S. L., Aguillard, R. N., & Nellur, S. N. (1994). Daytime sleepiness in insomnia: Behavioral, biological and subjective indices. *Sleep*, *17*(8), 63-702.
- Lundh, L.G., Lundqvist, K., Broman, J. E., & Hetta, J. (1991). Vicious cycles of sleeplessness, sleep phobia, and sleep-incompatible behaviors in patients with persistent insomnia. *Scandinavian Journal of Behavior Therapy*, *20*(3-4), 101-114.
- Marchini, E. J., Coates, T. J., Magistad, J. G., & Waldum, S. J. (1983). What do insomniacs do, think and feel during the day? A preliminary study. *Sleep*, *6*, 147-155.
- Mathews, A. & Milroy, R. (1994). Effects of priming and suppression of worry. *Behav. Res. Ther.*, *32*(8), 843-850.
- Monjan, A. A. (1990). Practical geriatrics: Sleep disorders of older people: Report of a consensus conference. *Hospital and Community Psychiatry*, *41*(7), 743-744.
- Morgan, K., Healey, D. W., & Healey, P. J. (1989). Factors influencing persistent subjective insomnia in old age: A follow-up study of good and poor sleepers aged 65-74. *Age & Aging*, *18*, 117-122.
- Morin, C. M. (1993). **Insomnia: Psychological assessment and management.** New York: Guilford.
- Morin, C.M., & Gramling, S.E. (1989). Sleep patterns and aging: Comparison of older adults with and without insomnia complaints. *Psychology and Aging*, *4*, 290-294.
- Morin, C. M., Kowatch, R. A., Barry, T., & Walton, E. (1993). Cognitive-behavior therapy for late-life insomnia. *Journal of Consulting and Clinical Psychology*, *61*(1), 137-146.
- Prinz, P. N., Vitiello, M. V., Raskind, M. R., & Thorpy, M. J. (1990, August). Geriatrics: Sleep disorders and aging. In F. Desforges (Ed.), **Current Concepts, The New England Journal of Medicine**, *323*(8), 520-526.
- Seidel, W. F., Ball, S., Cohen, S., Patterson, N., Yost, D., & Dement, W. C. (1984). Daytime alertness in relation to mood, performance, and nocturnal sleep in chronic insomniacs and noncomplaining sleepers. *Sleep*, *7*, 230-238.
- Stepanski, E., Koshorek, G., Zorick, F., Glinn, M., Roehrs, T., & Roth, T. (1989). Characteristics of individuals who do or do not seek treatment for chronic insomnia. *Psychosomatics*, *30*(4), 421-424.
- Van Egeren, L., Haynes, S. N., Franzen, M., & Hamilton, J. (1983). Presleep cognitions and attributes in sleep-onset insomnia. *Journal of Behavioral Medicine*, *6*, 217-232.

ACKNOWLEDGMENTS

This article is based on research conducted with assistance from grants from the Conseil Québécois de la recherche sociale (CQRS), the National Health Research and Development Program of Health Canada (NHRDP-PRNDS), and the Direction générale de l'enseignement collégial (PSCC). We are grateful for the generous support of these organizations as well as of Dawson College and the SMBD Jewish General Hospital. In addition, we would like to thank the dedicated members of our research team: Iris Alapin, Sally Bailes, Ann Gay, Darlene Judd, Jason Lavers, Harriet Lennox, John Martos, Kathleen J. McAdams, and Nettie Weinstein for their substantial contributions to this research.