

# Dysfunctional thought-behavior evaluation: effectiveness in differentiating psychophysiological insomnia from co-morbid insomnia

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## Abstract

**Background:** Dysfunctional thinking has been seen as one of the major factors in the maintenance of insomnia; however, there is no literature to elaborate on the differences in thought processes in different insomnia subtypes. The aim of the present study was to assess if we could differentiate psychophysiological insomnia from co-morbid insomnia by noting specific pre-sleep issues relating to dysfunctional thought and behavior.

**Methods:** Dysfunctional thought was noted for insomnia patients seen in Comprehensive Sleep Disorders Clinic at AIIMS, using a structured telephonic interview questionnaire. Later they were divided into two groups - patients with psychophysiological insomnia and patients with co-morbid insomnia. Responses were then analyzed using Fisher Exact test in STATA 11.0.

**Results:** There was no significant difference found between the two groups, for most of the dysfunctional statements given in the questionnaire. However, a significant difference was found in response for one of the statements concerned with the effect on next day's behavior of the patient as a result of dysfunctional thinking.

**Conclusion:** In this preliminary research, we found that patients with psychophysiological and co-morbid insomnia are similar in thoughts and behavior that are attributed to the maintenance of insomnia. However, the only difference noted was that patients with co-morbid insomnia had significantly greater 'worry about next day's functioning' as a result of poor sleep and hence, affecting their behavior for the next day with regard to social and occupational functioning.

**Keywords:** Insomnia, Dysfunctional thoughts, Differentiating co-morbid with Psychophysiological insomnia, Behavioral outcome.

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## Introduction

Cognitive processes have been reported in various published studies, to be involved in the maintenance of insomnia regardless of its causal factor. It has been noted that people with insomnia tend to have intrusive thoughts and uncontrollable worry, negatively toned cognitive activity about sleep and sleep-

related issues. The presence of anxiety in these patients results in attention bias which further leads to automatic monitoring of threat cues which causes further worry and concern. People with insomnia, thus, tend to suffer from 'distortions of reality'<sup>1</sup>. These and additional processes such as erroneous beliefs and safety behaviors, which operate during daytime and night time; act as obstacles for good sleep. Beliefs in the long-term negative consequences of insomnia, anxiety, depression, and arousal are related to the maintenance of persistent insomnia and these mechanisms often co-occur in individuals with persistent insomnia<sup>2</sup>. Attempts have also been made to assess the differences in those having chronic insomnia with those having isolated insomnia and it was found that the cognitive bias is more in the former<sup>3</sup>. Espie talks about the AIE syndrome which explains the cognitive difference between normal sleep and psychophysiological insomnia in terms of attention, intention, and effort. In psychophysiological insomnia, there is selective attention to sleep, sleeplessness and sleep consequences; activated intention to sleep; direct and indirect sleep effort; and sleep preoccupation and persistent insomnia complaint<sup>4</sup>. The behavioral manifestations of insomnia are also seen in terms of poorer physical and mental quality of life and work productivity loss and activity impairment<sup>5,6</sup>.

However, there is little literature to elaborate on differences in both night-time and 24 hours thought processes and behaviors among patients with different insomnia subtypes. If such a difference exists then it could be utilized in the differential diagnosis of different types of insomnia as well as for tailoring interventions accordingly.

The aim of the study was to evaluate differences in specific pre-sleep issues relating to dysfunctional thought and behavior between patients with psychophysiological insomnia and co-morbid insomnia (mainly with the psychiatric disorder).

## Methods

In a cross-sectional case-control study design, consecutive patients diagnosed with chronic insomnia (with or without co-morbid psychiatric disorder), between 2006 and 2012, at the comprehensive Sleep Disorders Clinic at the All India Institute of Medical Sciences, New Delhi, India, were included in this study.

Exclusion criteria were: patients with other primary insomnias (like paradoxical) and other primary sleep disorders (RLS, OSA). Patients with other serious co-morbid medical and/or neurological conditions were also excluded.

The brief questionnaire administered to all subjects comprised of statements reflecting common unpleasant intrusive thoughts and safety behavior frequently reported by patients with insomnia during the pre-sleep period. Several statements were drafted utilizing the literature available on cognitive factors in the maintenance of insomnia. Subject matter experts were also consulted after formulating the statements, and 10 statements were chosen for the final pre-structured interview questionnaire.

## Procedure

A list of patients was prepared from the data available in EXCEL spreadsheets from 2006 to 2012. All the patients included were interviewed telephonically using the pre-structured interview questionnaire. The statements were recorded in responses of 'yes' and 'no', and all the responses where both groups chose a 'yes' were compared. Also, the Likert scale rating for the 'yes' response with number range 1-5 and the input for options share subjective explanation for the rating were captured. However, as the respondents found it difficult to rate, only 'yes' and 'no' response was taken for analysis. They were divided into two groups; Group-1 included patient diagnosed with psychophysiological insomnia and Group-2 included those with co-morbid insomnia. The responses were recorded in EXCEL spreadsheets and then were statistically analyzed using the STATA 11.0 statistical software. Fisher Exact test also was used for comparison between the two groups.

## Results

A total of 91 patients with insomnia were seen during the period of 2006 to 2012. Out of these contact information for 64 patients were available. Only 30 patients were available on phone, out of which, 20 responded. There were 8 individuals in total in group 1 (3 females and 5 males) and 12 individuals in group 2 (8 females and 4 males). The mean age of group 1 and group 2 was found to be 43.25±10.08 and 49±9.96 respectively ( $p = 0.39$ ).

Appendix

(Questionnaire used for the pre-structured telephonic interview)

**Questionnaire: for quantifying dysfunctional thoughts in patient with insomnia**

**Instructions:** Given here are few statements which individuals with sleep problem commonly report. I would like you to go through them and indicate whether the statement applies to you or not by putting a tick mark on Yes or No. I would also like you to provide me with the frequency of such thought / behavior if your answer to it is “Yes”. A ‘0’ would mean “not at all” and ‘5’ would mean “very much”. Apart from this, there is a blank provided in which you can subjectively explain the frequency indicated by you. If you have any doubts then please ask.

Oh! Poor me, I suffer from this horrible sleep problem	Yes/ No
0 1 2 3 4 5	
Shall I be able to sleep at all tonight?	Yes/ No
0 1 2 3 4 5	
If I can't sleep tonight, how will I work tomorrow?	Yes/ No
0 1 2 3 4 5	
Oh! It's already 12:00/1:00/2:00am/....and I don't feel sleepy at all	Yes/ No
0 1 2 3 4 5	
I think I am hungry/ thirsty	Yes/ No
0 1 2 3 4 5	
I am so tired; I cannot do anything else.	Yes/ No
0 1 2 3 4 5	
(when evening approaches) Oh! Will I be able to sleep today or not?	Yes/ No
0 1 2 3 4 5	
Oh! There are so many concerns and things to worry over, I am unable to sleep.	Yes/ No
0 1 2 3 4 5	
My mind keeps racing and I am unable to sleep so I try to control all my thoughts.	Yes/ No
0 1 2 3 4 5	
I could not sleep well last night so I plan to keep the coming day easy.	Yes/ No
0 1 2 3 4 5	

The analysis of 10 statements using Fisher’s Exact Test is given below in the following table:

S.no.	Fisher’s Exact (p-value)	Group 1 % yes	Group 2 % yes
1.	1	75	75
2.	1	75	75
3.	0.670	62	50
4.	0.642	75	58
5.	1	25	25
6.	1	50	41.67
7.	0.362	37.50	66.67
8.	1	75	66.67
9.	1	50	50
10.	0.015	0	58.33

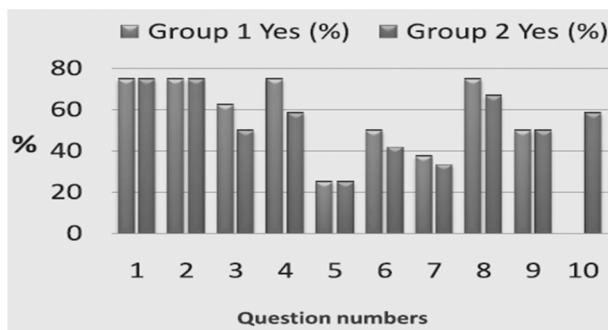


Figure 1: Diagrammatic representation of responses to different questions pertaining to dysfunctional thoughts about sleep, among patients with primary versus co-morbid insomnia.

No significant difference was found between two groups for the statements 1 to 9 in the questionnaire. However, a significant difference was found only for question number 10, which was concerned with the effect on next day’s behavior of the patient as a result of dysfunctional thinking (Figure 1).

**Discussion**

In this study aimed at identifying differences, if any, in the prevalence of dysfunctional thoughts among patients with psychophysiological versus co-morbid insomnia, we found that the only but major difference was in the way the latter group associated next day’s functioning with sleep.

Major studies on the prevalence of dysfunctional beliefs and attitudes towards sleep and the measurement thereof were conducted by Morin et al, in which they developed and validated the detailed and brief versions of the DBAS (dysfunctional beliefs and attitudes about sleep) scales<sup>7,8</sup>. While there were a number of statistical observations, in these the perception of worry about daytime functioning was found highly prevalent.

In a more recent study, Crönlein et al did not find any difference between patients with primary insomnia compared to those with other sleep disorders, as far as dysfunctional thoughts and beliefs are concerned. This finding is similar to ours, except that the fine detail elicited by our questionnaire among those with co-morbid insomnia<sup>9</sup>.

The two groups were found similar in thoughts and behavior that are attributed to the maintenance of insomnia. However, the last finding is of particular importance, because it suggested to a difference in both groups particularly the effect of sleep-related belief in the daytime behavior/ functioning. From the result obtained in this preliminary research it could be supposed that as the patients with co-morbid insomnia have to go through co-morbid condition of anxiety, depression, pain, chronic physiological illness, or alcohol/ substance abuse etc. which also have negative effect on person’s social and occupational functioning, an additional problem of inability to sleep make them feel more vulnerable and incapable of performing well the following day. It could be this kind of reasoning that could result in affecting their daytime behavior after a sleepless night for opting for an easy day instead of a regular day or postponing important task of that day to another day when they would have atleast slept better. It could also be that they see the co-morbid condition as persistent or constant and sleep problem as an added problem or an indicator of the severity of their co-morbid condition.

In another research with elderly patients, it was observed that elderly patients with insomnia differ with other patients with insomnia and without insomnia in the manner that they also usually complain of poorer daytime functioning. The effect on daytime functioning was observed in this study and it was found that although elderly patients present with poorer state of psychological and social well-being when assessed does not appear to differ in level of conducting basic and instrumental activities<sup>10</sup>.

This is preliminary research and more detailed evaluation in larger groups would bring forward more information on dysfunctional beliefs, thoughts, and attitudes among patients with insomnia of different etiologies. This would be important in identifying a more targeted approach for cognitive behavior therapy for insomnia.

## Conclusion

The results show that patients with psychophysiological and co-morbid insomnia are similar in thoughts and behavior that are attributed to the maintenance of insomnia. However, a striking difference in the worry about daytime functioning as a result of poor sleep was observed; seen only among patients with co-morbid insomnia.

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