Which is the Best Predictor of Insomnia during the Cancer Care Trajectory: Dysfunctional Beliefs about Sleep or Those about Cancer?

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INTRODUCTION

- Insomnia affects up to 60% of cancer patients;
- Dysfunctional beliefs about sleep such as having unrealistic sleep expectations are commonly reported among people with insomnia;
- Dysfunctional beliefs about cancer such as engaging in self-blame or catastrophizing the consequences of the illness are commonly reported by cancer patients;
- These two types of dysfunctional beliefs have been found to be associated with insomnia in cancer patients, but no study has yet examined which one is the best predictor.

STUDY GOAL

To assess which one between dysfunctional beliefs about sleep and dysfunctional beliefs about cancer is the best predictor of insomnia incidence, persistence and severity in cancer patients, during an 18-month longitudinal study.

METHODS

Participants

Inclusion criteria

- to have received a confirmation for a first diagnosis of non-metastatic cancer;
- to be scheduled to receive a curative surgery;
- to be aged between 18 and 80 years old;

Exclusion criteria

- to have received a neoadjuvant treatment for cancer;
- to have severe cognitive impairments (e.g., Alzheimer's disease) or a severe psychiatric disorder (e.g., psychosis, bipolar disorder) as noted in the medical chart, observed at recruitment, or reported by the patient;
- to have received a diagnosis for a sleep disorder other than insomnia (e.g., obstructive sleep apnea, periodic limb movements);
- to have severe visual, hearing or language defects impairing their capacity to complete the measures.

3196 patients were solicited to take part in this study

- 1677 patients were eligible (52.5% of solicited patients)
- 962 of them agreed to participate (57.4% of eligible patients)
- 912 (final sample) completed the *Insomnia Interview Schedule* (94.8% of the original sample)

Participants' demographic and clinical characteristics at baseline (*N* = 912)

Variables		M (SD)	%
Age (years; range = 23-79)		56.9 (9.9)	
Gender	Male		35.4
	Female		64.6
Cancer site	Breast		49.2
	Prostate		27.2
	Gynaecological		11.4
	Other		12.2
Time since cancer diagnosis (months; range = 0-17)		2.2 (1.9)	
Dysfunctional Beliefs and Attitude about Sleep scale (range = 0-9.9)		3.7 (1.7)	
Dysfunctional Beliefs and Attitude about Cancer scale (range = 0-10)		2.6 (1.8)	
Sleep status	Good sleepers		40.6
	Insomnia symptoms or syndrome		59.4
Insomnia severity (ISI; range = 0-27)		8.8 (6.0)	

Procedure

As part of a larger longitudinal study

- Potential participants were recruited at L'Hôtel-Dieu de Québec and l'Hôpital du Saint-Sacrement, Québec, Canada
- A research assistant met patients and explained the study goals and procedures
- Patients agreeing to participate were asked to provide their written consent
- Patients received a battery of self-report scales and were asked to complete it within two weeks and return it by mail at six time points:

T 1 Baseline	→	T 2 2 months	→	T 3 6 months	→	T 4 10 months	→	T 5 14 months	→	T 6 18 months

2 months   4 months   4 months   4 months   4 months
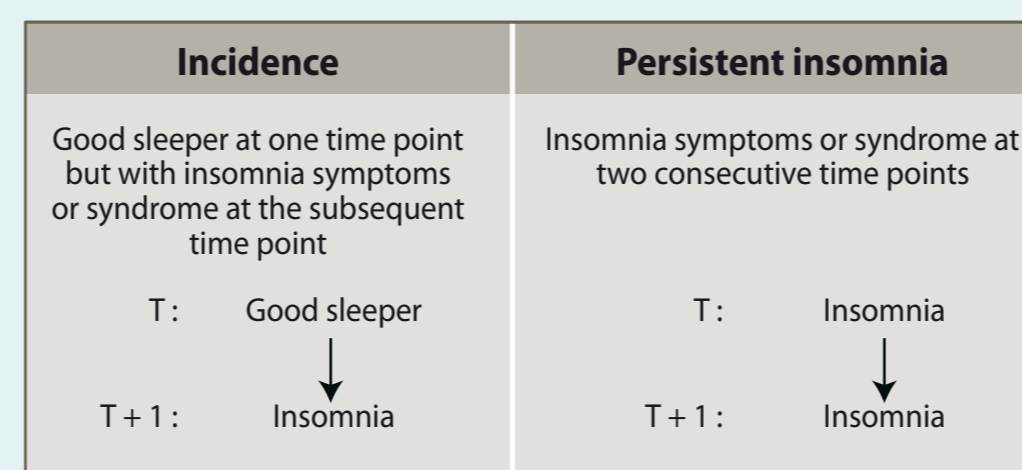
Measures

The battery included :

- brief version of the *Dysfunctional Beliefs and Attitudes about Sleep scale* (DBAS-16; Morin, Vallières, & Ivers, 2007), assessing:
  - misconceptions about the causes of insomnia
  - misattribution or amplification of its consequences
  - unrealistic sleep expectations
  - diminished perception of control and predictability of sleep
  - faulty beliefs about sleep-promoting practices
- 5-item questionnaire developed by our research team to evaluate dysfunctional beliefs about cancer, assessing how much participants agreed with the following statements on an 11-point Likert scale ranging from "0" (*strongly disagree*) to "10" (*strongly agree*):
  - *Dying of cancer is horrible and painful;*
  - *It's my fault if I have cancer;*
  - *Everything is horrible in my life since I have cancer;*
  - *It is impossible to be happy when you have cancer;*
  - *Life is not worth living because I have cancer.*
- *Insomnia Interview Schedule* (IIS; Morin, 1993), a semi-structured interview evaluating :
  - current presence and duration of the insomnia syndrome and symptoms
  - utilization of prescribed medications and of other substances as sleep aids
- *Insomnia Severity Index* (ISI; Bastien, Vallières & Morin, 2001)

At each time point, participants were categorized into one of these three groups based on the IIS:

Good sleepers	• No subjective complaint of sleep difficulties • No hypnotic use
Insomnia symptoms	• Complaint of sleep difficulties without meeting the criteria for an insomnia syndrome OR • Hypnotic medication 1 or 2 nights/week
Insomnia syndrome	• Subjective complaint of sleep difficulties • Sleep onset latency or wake after sleep onset ≥ 30 minutes • ≥ 3 nights per week • Duration ≥ 1 month • Associated with impaired daytime functioning or marked distress OR • Hypnotic medication ≥ 3 nights per week for ≥ 1month

At each time point, participants with insomnia were categorized as presenting incidence or persistence of insomnia:

| Incidence	Persistent insomnia
Good sleeper at one time point but with insomnia symptoms or syndrome at the subsequent time point	Insomnia symptoms or syndrome at two consecutive time points
T : Good sleeper	T : Insomnia
↓	↓
T + 1 : Insomnia	T + 1 : Insomnia

Statistical analyses

- At T1, all participants were categorized into three groups of equal size, based on their baseline dysfunctional beliefs about sleep and cancer scores (low = 1st to 33rd percentile, moderate = 34th to 66th percentile, and high = 67th to 100th percentile);
- Logistic regression analyses controlling for age, cancer site, adjuvant treatments and psychotropic medication use were performed to estimate the risk of experiencing incidence and persistence of insomnia at least on one occasion throughout the study, according to levels of dysfunctional beliefs about sleep versus cancer at T1;
- Linear regression analyses were performed at each time point to study the total and unique contribution of these two types of beliefs on insomnia severity scores.

RESULTS

- Higher levels of dysfunctional beliefs about sleep and cancer at T1 were not significantly associated with insomnia incidence but were significantly associated with the persistence of insomnia throughout the duration of the study, with no significant difference between the two types of beliefs (OR sleep = 1.56, 95% CI = 1.15 to 2.10, vs. OR cancer = 1.35, 95% CI = 1.01 to 1.81).

Associations between dysfunctional beliefs about sleep versus cancer at T1 and incidence of insomnia during the 18-month period
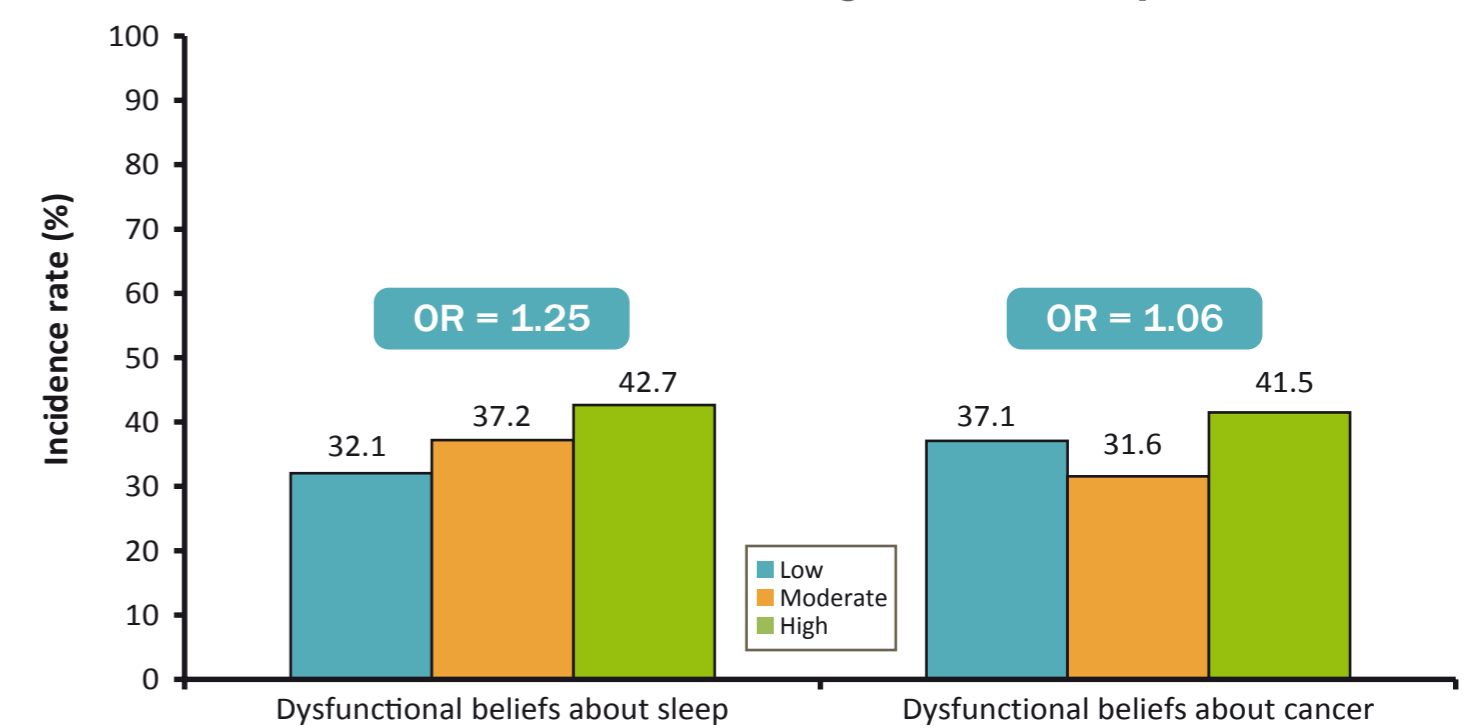
Associations between dysfunctional beliefs about sleep versus cancer at T1 and persistence of insomnia during the 18-month period
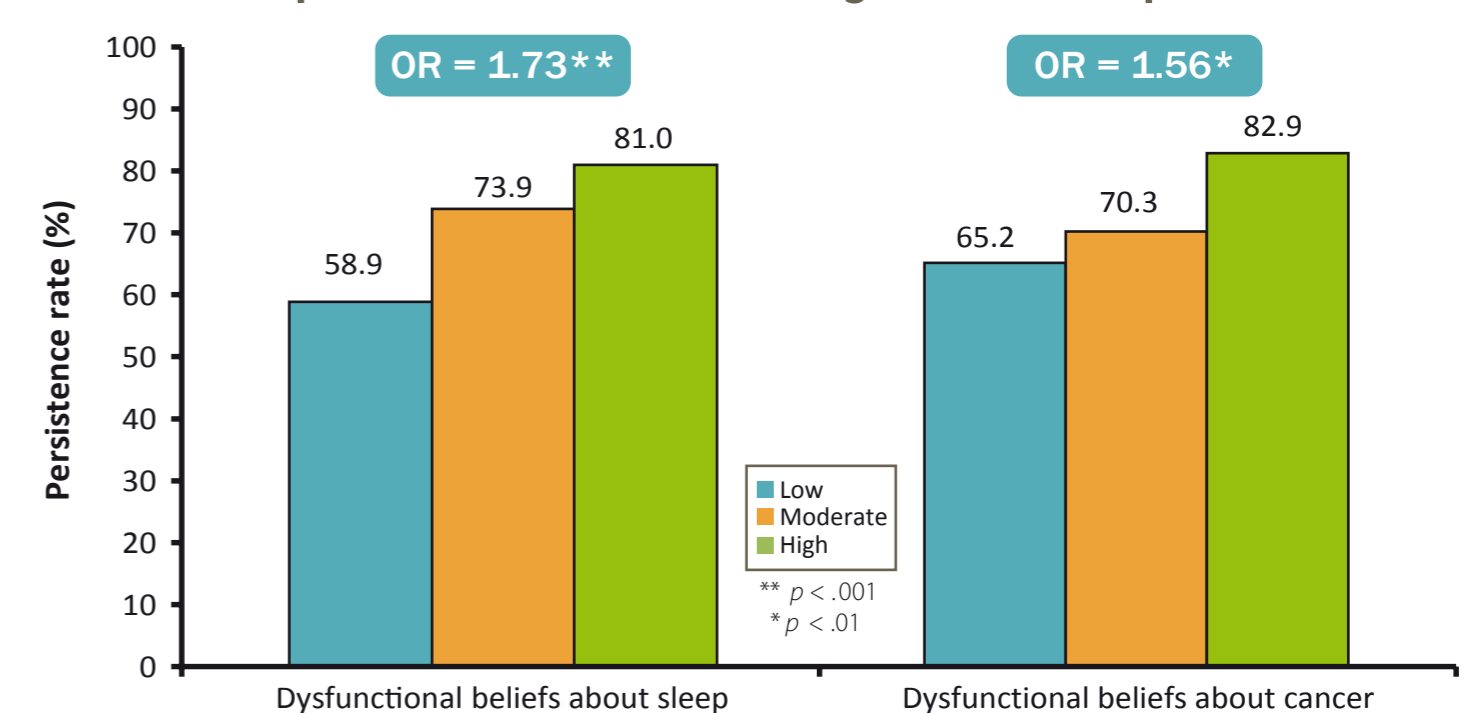
Total and unique contribution of dysfunctional beliefs about sleep versus cancer at baseline on insomnia severity scores (ISI) at each time point (adjusted β)

Time point	Dysfunctional beliefs about sleep		Dysfunctional beliefs about cancer	
	Total	Unique	Total	Unique
T1	0.299***	0.279***	0.169***	0.038
T2	0.408***	0.396***	0.209***	0.024
T3	0.481***	0.456***	0.255***	0.049
T4	0.467***	0.491***	0.197***	-0.042
T5	0.490***	0.473***	0.299***	0.026
T6	0.432***	0.438***	0.229***	-0.010

*** *p* < .0001

- The total contribution of both types of beliefs was significant at each time point in predicting the severity of insomnia;
- When the two types of beliefs were included in the model, only those about sleep remained significantly associated with insomnia severity.

CONCLUSION

- These findings replicate previous studies that have supported the role of dysfunctional beliefs about sleep in predicting the persistence of insomnia (Jansson & Linton, 2007; Morin, Stone, Trinkle, Mercer, & Remsberg, 1993), but also suggest that dysfunctional beliefs about cancer may constitute another risk factor;
- Both types of beliefs were associated with insomnia severity throughout the cancer care trajectory, but those about sleep were the best predictor;
- These results highlight the clinical relevance of performing cognitive restructuring on the two types of beliefs as part of the insomnia treatment, with a particular focus on those about sleep.