A network approach of Insomnia and Dysfunctional Beliefs and Attitudes About Sleep

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Introduction





Negatively toned cognitive activity triggers arousal and distress, channeling attention and monitoring to sleep, and creating distorted perceptions (Harvey, 2002).

Challenging unhelpful beliefs about sleep is a crucial element of cognitive-behavioral therapy for insomnia.

Understanding how this network of beliefs connects to insomnia severity may provide leads to help targeted interventions.

Introduction

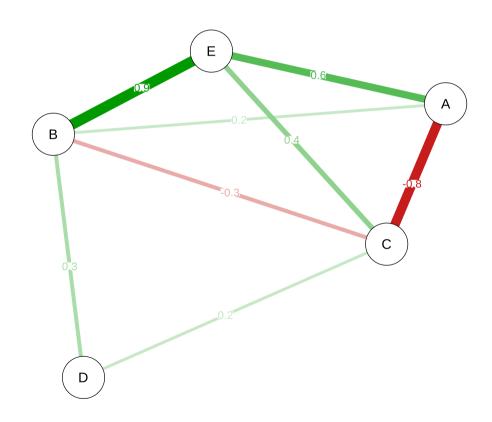




A **network** structure is represented by **nodes** (variables), connected by **edges** (strength of associations) (Burger et al., 2022).

Measures of centrality (Borsboom et al., 2021):

- **Node strenght**: sums the absolute edge weights of edges per node;
- **Closeness**: quantifies the distance between the node and all other nodes;
- **Betweenness**: quantifies how often a node lies on the shortest path connecting any two other nodes.



Objective





To use a network approach to explore interactions between dysfunctional beliefs and attitudes about sleep and insomnia severity.

To identify specific nodes within dysfunctional beliefs and attitudes about sleep that may play a pivotal role in maintaining insomnia.

Method





Participants: 1166 adults, aged 18 to 59 years, both with and without insomnia symptoms.

Instruments:

- Insomnia Severity Index (ISI);
- Dysfunctional Beliefs and Attitudes about Sleep Scale (DBAS-16).

Method





We fitted Gaussian graphical models using graphical LASSO regularization in combination with Extended Bayesian Information Criterion (EBIC) model selection, with a tuning hyperparameter set to 0.5.

- A network describing the associations among overall insomnia severity and the four **factors** of DBAS-16
- A network describing the associations among overall insomnia severity and each of the individual **items** of DBAS-16.

The stability of the network structures was estimated using a case dropping bootstrap procedure (1000 iterations). Node centrality was assessed by strength, closeness, and betweenness.

Sample Characteristics





• Age: 38.28 (9.76)

• **Gender (Female)**: 927 (79.5%)

• **Insomnia symptoms**: 935 (80.19%)

• Race/ethnicity:

Asian: 41 (3.52%)

Black: 279 (23.93%)

White: 835 (71.61%)

o Other/Not informed: 11 (0.94%)

• Education:

- College degree or higher: 891 (76.42%)
- Some college: 166 (14.24%)
- Less than 12th grade: 109 (9.35%)

• Region of origin:

o North: 24 (2.06%)

Northeast: 85 (7.29%)

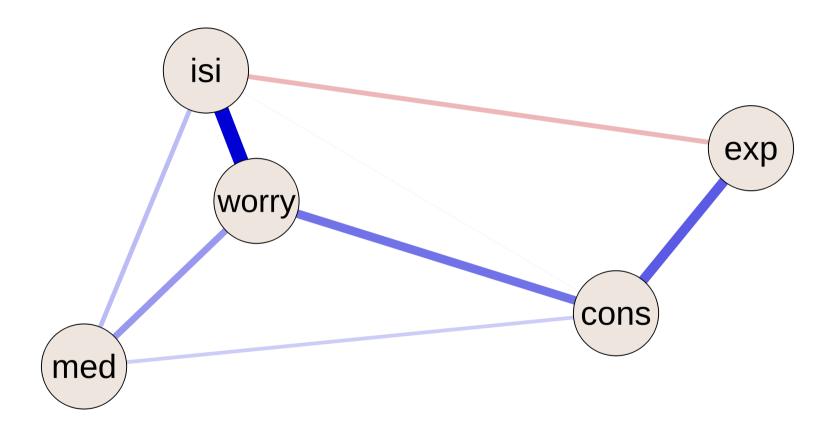
Central-West: 51 (4.37%)

Southeast: 905 (77.62%)

o South: 101 (8.66%)







isi = Insomnia Severity Index, worry = Worry about sleep, exp = Sleep expectations, cons = Consequences of insomnia, med = Medication.







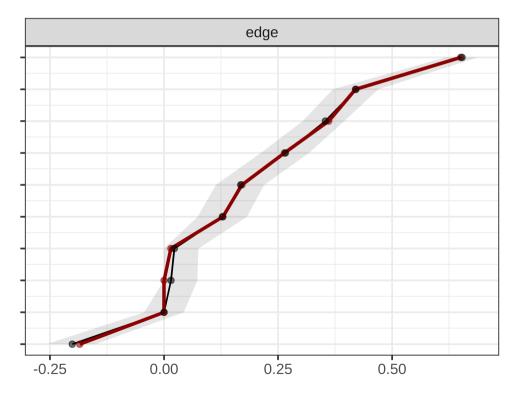


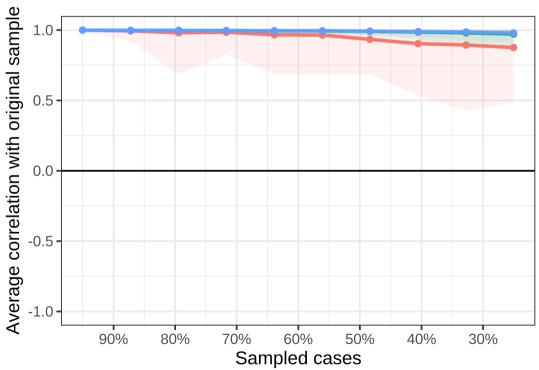




Bootstrap mean Sample

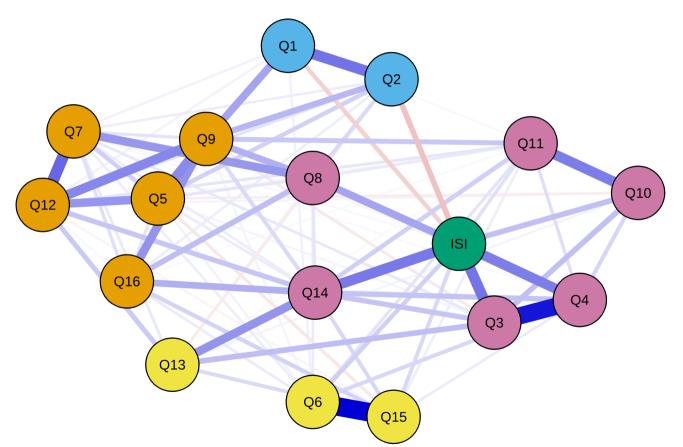












Consequences

- Q5: After a poor night's sleep, I know that it will interfere with
- my daily activities on the next day Q7: When I feel irritable, depressed, or anxious during the day, it is mostly because I did not sleep well the night before
- Q9: Without an adequate night's sleep, I can hardly function the next day
- o Q12: When I feel tired, have no energy, or just seem not to function well during the day, it is generally because I did not sleep well the night before
- O16: I avoid or cancel obligations (social, family) after a poor night's sleep

Expectations

- O Q1: I need 8 hours of sleep to feel refreshed and function well during the day
- Q2: When I don't get proper amount of sleep on a given night,
- I need to catch up on the next day by napping or on the next night by sleeping longer
- Insomnia Severity Index
- o ISI: Insomnia Severity Index

- Q6: In order to be alert and function well during the day,
- I believe I would be better off taking a sleeping pill rather than having a poor night's sleep
- O13: I believe insomnia is essentially the result of a chemical imbalance
- O Q15: Medication is probably the only solution to sleeplessness

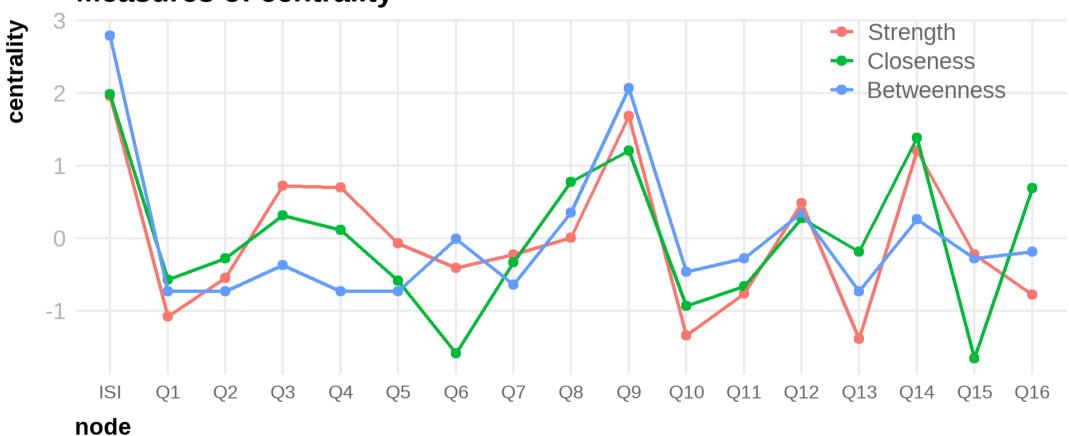
Worry

- Q3: I am concerned that chronic insomnia may have serious consequences on my physical health
- O4: I am worried that I may lose control over my abilities to sleep
- o Q8: When I sleep poorly on one night, I know it will disturb my sleep schedule for the whole week
- Q10: I can't ever predict whether I'll have a good or poor night's sleep
- O Q11: I have little ability to manage the negative consequences of disturbed sleep
- Q14: I feel insomnia is ruining my ability to enjoy life and prevents me from doing what I want



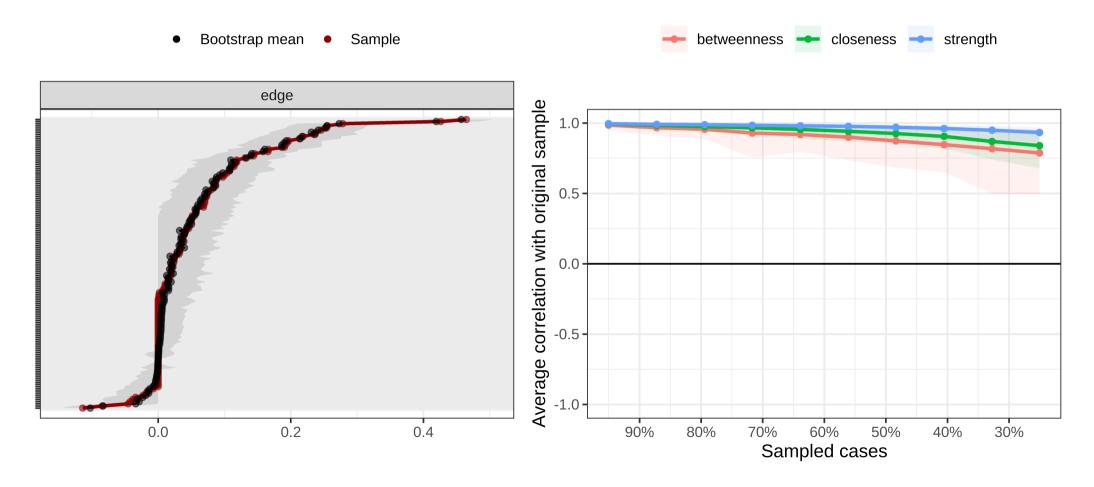












Conclusion





- We used Network analysis as an exploratory technique to identify patterns that may help interpreting empirical phenomena.
- Worry about sleep is a factor that can directly influence other nodes.
- Belief that a poor night of sleep would ruin functioning on the next day and feelings that *insomnia is ruining ability to enjoy life* are possible targets to for improving CBT-I.
- These findings may benefit the efficiency of future intervention studies by identifying priority symptoms for treatment.

References





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Thank you





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