

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

VII Congresso Clínica Psiquiátrica 2022

Marwin M I B Carmo  
Renatha El Rafihi Ferreira

Department of Psychiatry, Faculty of Medicine, University of São Paulo, Brazil



# 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.

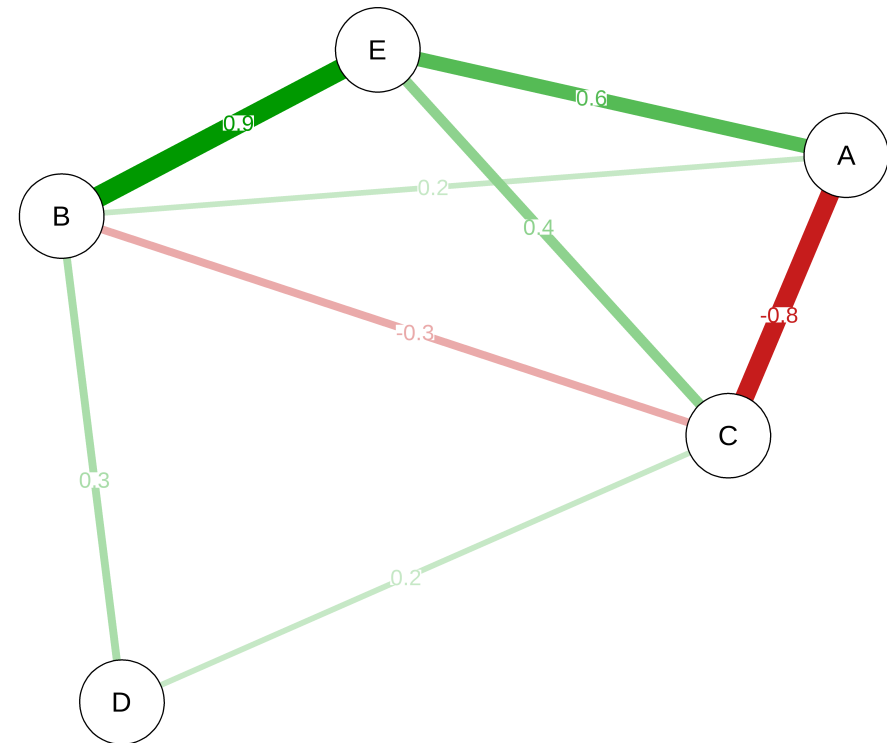
Understanding how this network of beliefs connects to insomnia severity may provide leads to help targeted interventions.

# 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 strength**: 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.

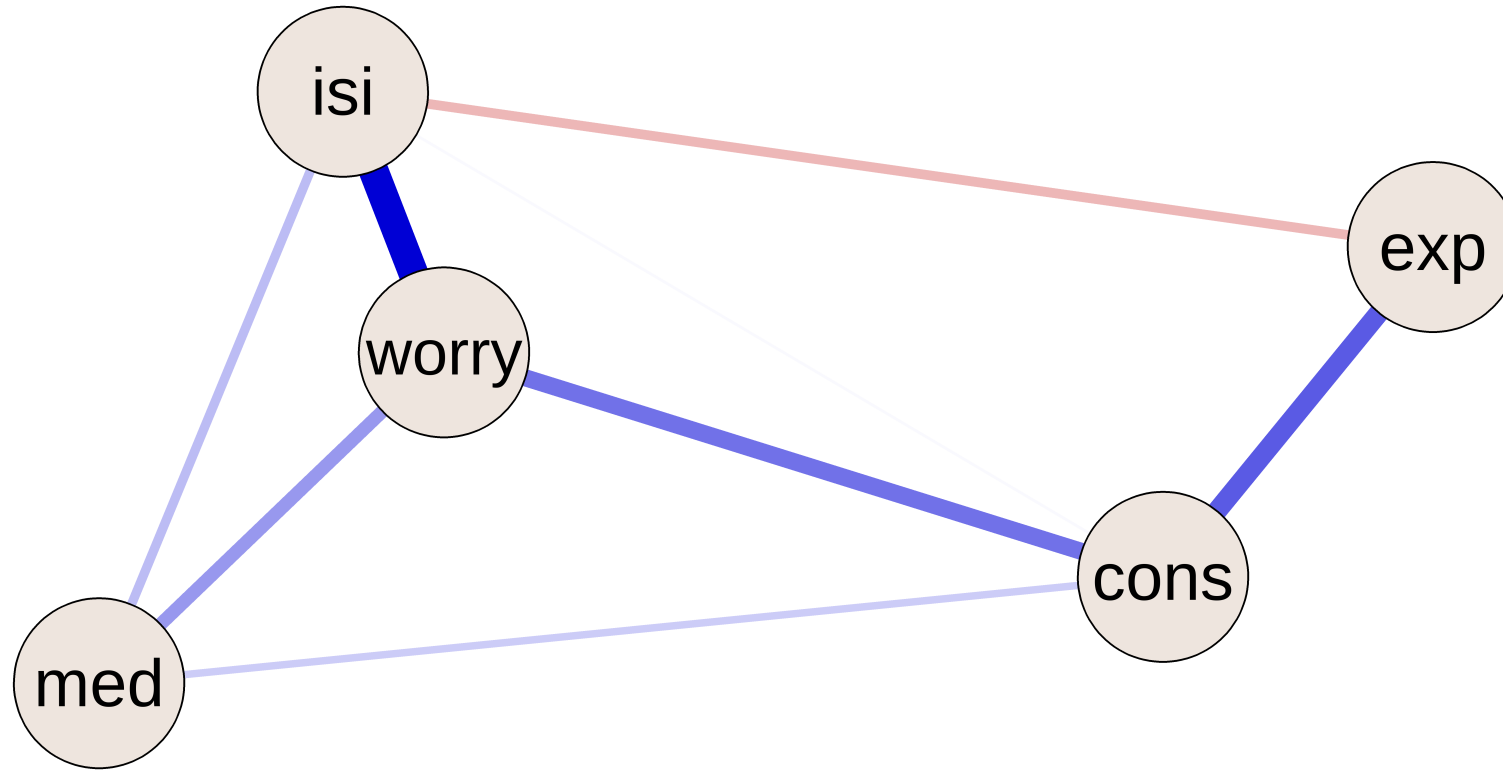
The stability of the network structures was estimated using a case dropping bootstrap procedure (1000 iterations). Node centrality was assessed by strength, closeness, and betweenness.

# 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%)
  - 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:**
  - North: 24 (2.06%)
  - Northeast: 85 (7.29%)
  - Central-West: 51 (4.37%)
  - Southeast: 905 (77.62%)
  - South: 101 (8.66%)

# Results

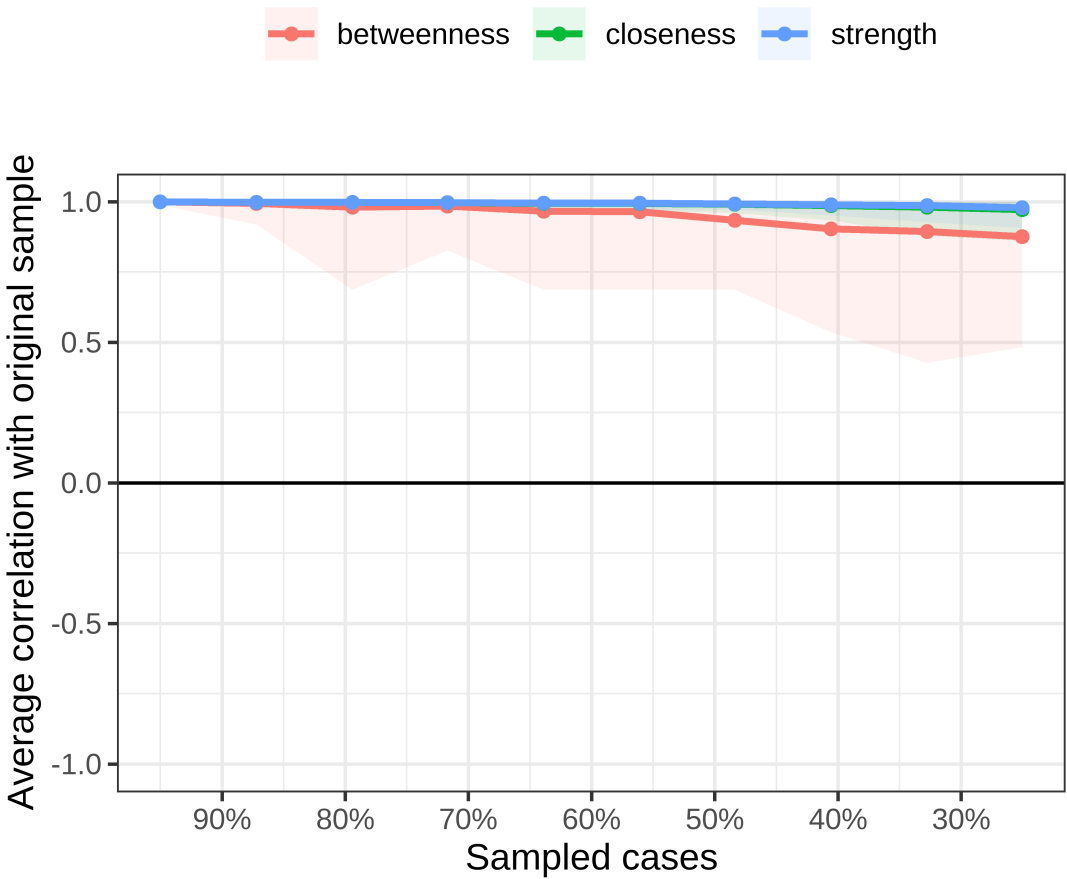
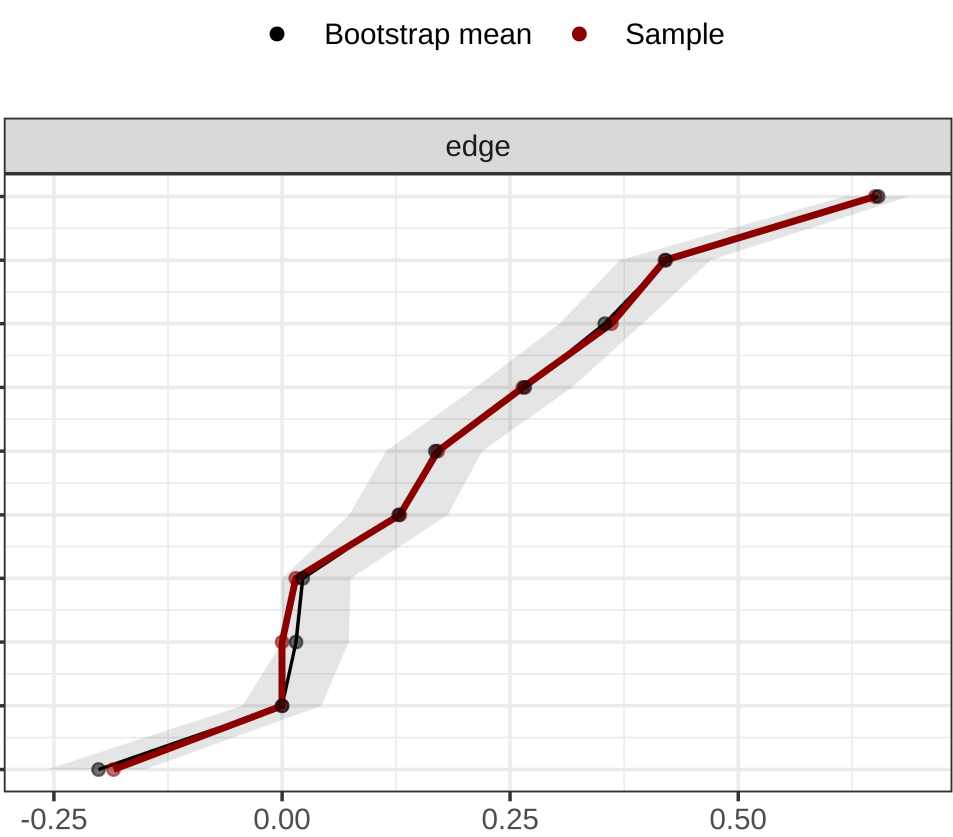


isi = Insomnia Severity Index, worry = Worry about sleep, exp = Sleep expectations, cons = Consequences of insomnia, med = Medication.

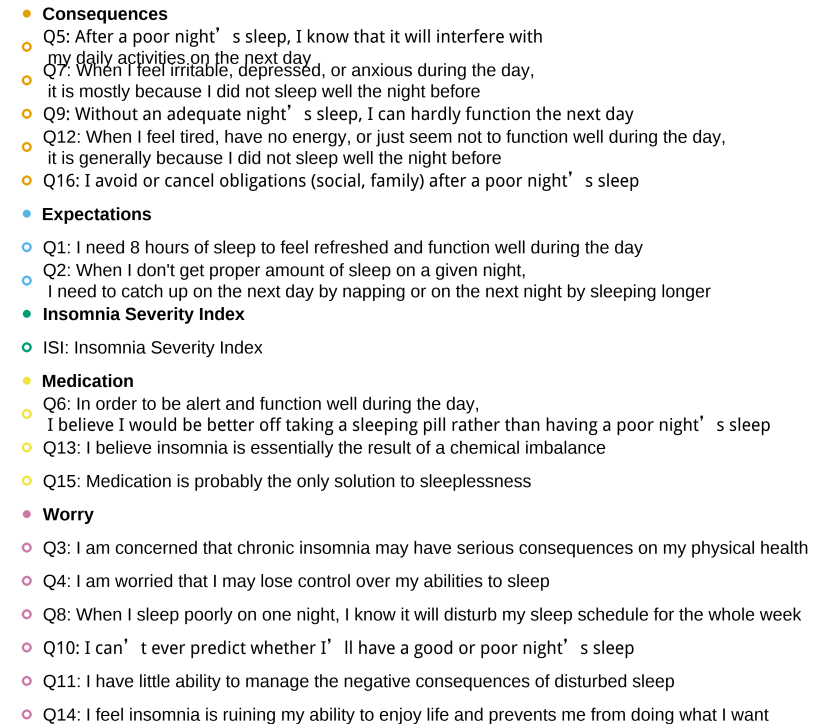


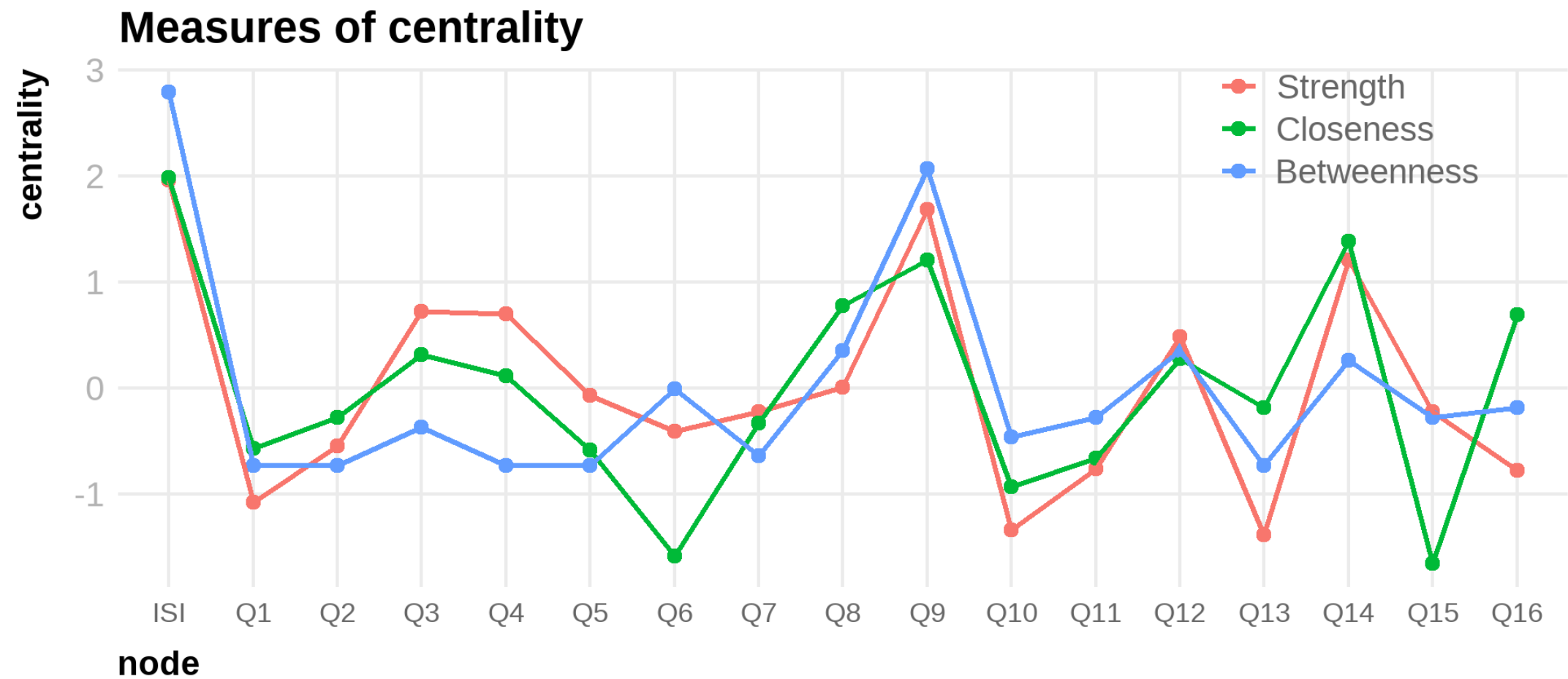


# Results

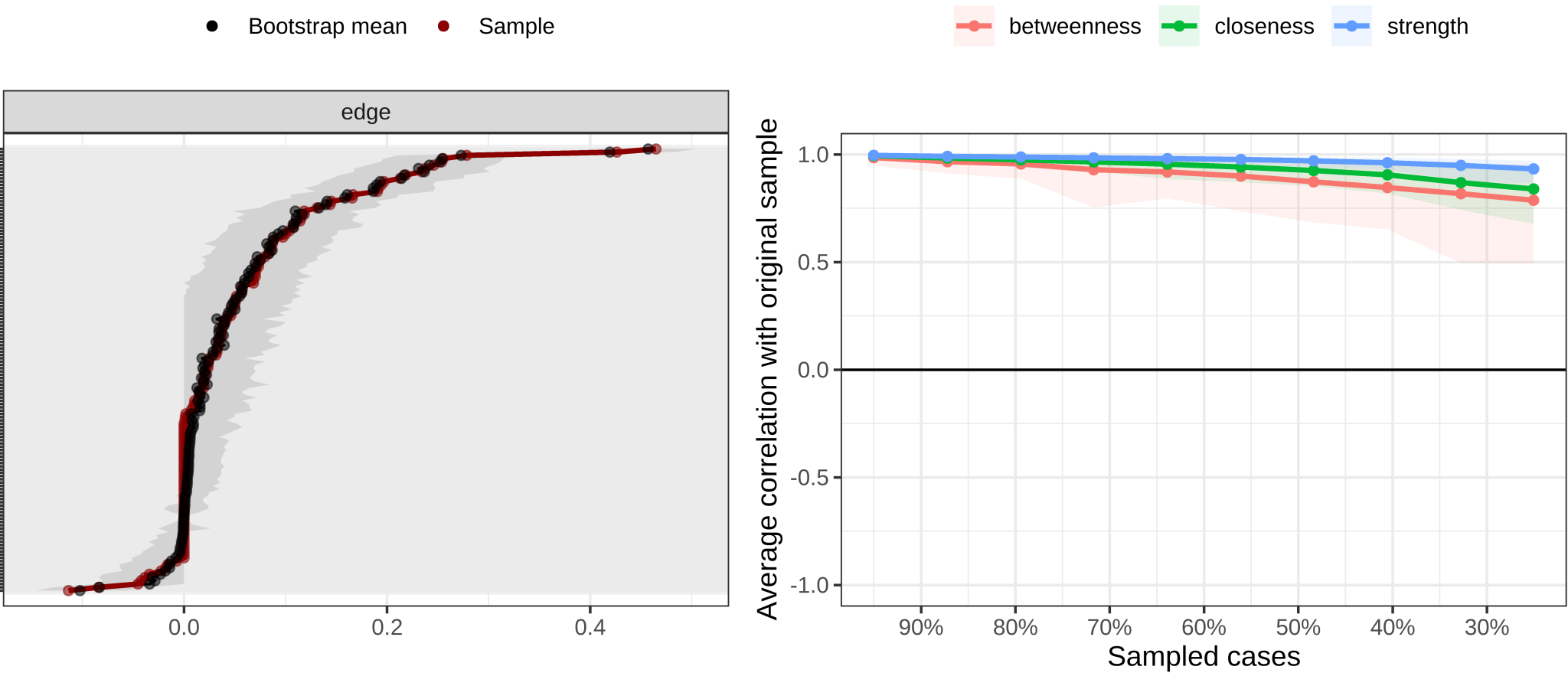


**FAPESP** **IPq**  
INSTITUTO DE PSIQUIATRIA HCFMUSP





# Results



# 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

Harvey, A. G. (2002). A cognitive model of insomnia. *Behaviour Research and Therapy*, 40(8), 869–893. <https://doi.org/10/fwxq35>

Borsboom, D., Deserno, M. K., Rhemtulla, M., Epskamp, S., Fried, E. I., McNally, R. J., Robinaugh, D. J., Perugini, M., Dalege, J., Costantini, G., Isvoranu, A.-M., Wysocki, A. C., van Borkulo, C. D., van Bork, R., & Waldorp, L. J. (2021). Network analysis of multivariate data in psychological science. *Nature Reviews Methods Primers*, 1(1). <https://doi.org/10.1038/s43586-021-00055-w>

Burger, J., Isvoranu, A.-M., Lunansky, G., Haslbeck, J. M. B., Epskamp, S., Hoekstra, R. H. A., Fried, E. I., Borsboom, D., & Blanken, T. F. (2022). Reporting standards for psychological network analyses in cross-sectional data. *Psychological Methods*. <https://doi.org/10.1037/met0000471>

# Thank you



## Contact:

- Email: [marwin@usp.br](mailto:marwin@usp.br)
- Webpage: <https://marwincarmo.github.io/>
- Github: [marwincarmo](#)
- Twitter: [marwincarmo](#)
- Linkedin: [Marwin Carmo](#)

This presentation was created using  
`xaringan` package for R. Code available at  
[bit.ly/viiccp-code](https://bit.ly/viiccp-code)

Access the slides at



[bit.ly/viicp-dbas](https://bit.ly/viicp-dbas)