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Impaired awareness in patients with Korsakoff syndrome living in long-term care facilities: a network analysis

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Introduction

Korsakoff syndrome (KS) is a neuropsychiatric disorder characterized by cognitive impairments and challenging behavior like apathy and agitation. Institutionalization in specialized long-term care facilities (LTCFs) with multidisciplinary care is often necessary.

Impaired awareness is also highly common in KS patients living in Dutch LTCFs. We believe that it might be associated with problem behavior and reduced functioning in different domains, yet how these symptoms interact remains unclear.

Aims

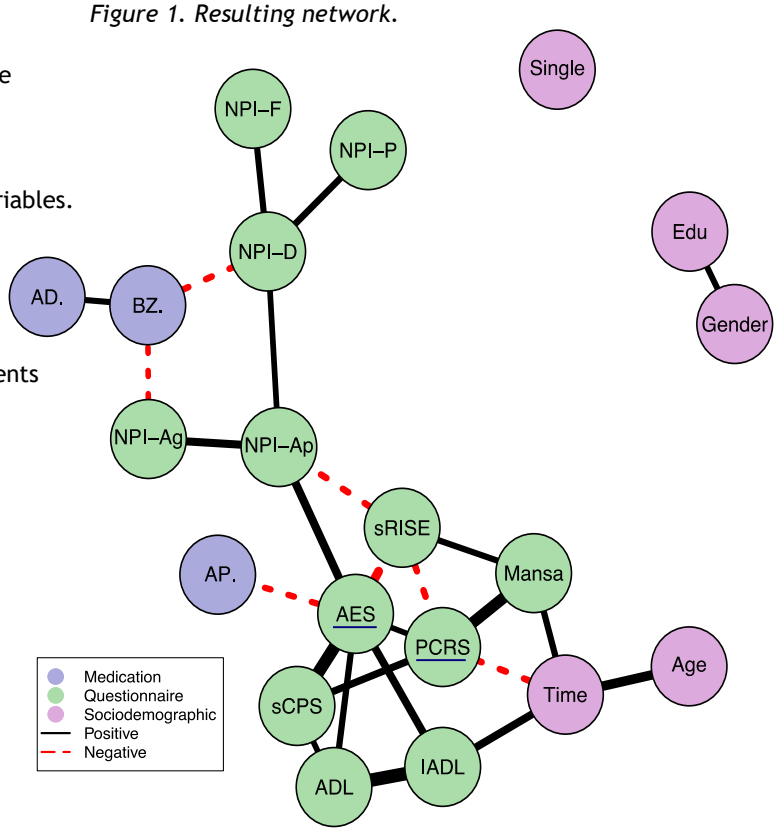
To explore the relationship between impaired awareness and cognitive, neuropsychiatric, social and physical functioning in patients with KS living in Dutch LTCFs.

Methods

- A ***network analysis*** was applied to visualize the interconnected variables.
- A network consists of nodes (variables) and edges (relationships between variables, representing *substantial* associations).
- Edges were learned from the imputed and transformed data, to which we fitted a Gaussian graphical model.
- A thicker line indicates a stronger association.
- We used data from a retrospective, cross-sectional study of KS patients (N=210) living in Dutch LTCFs.

Code	Variable	Mean [SD]	Count [%]
	Sociodemographic and clinical characteristics		
Age	**Age**	63,1 [7,9]	
Gender	**Gender (male)**		163 [77,6%]
Time	**Duration of admission in LCTF (years)**	6,7 [5,6]	
Edu	**Education (category)**		
	Elementary/lower		122 [68,2%]
	Secondary		42 [23,5%]
	Higher/university		15 [8,4%]
Single	**Single, divorced or widow(er)**		183 [91,5%]
	Use of ≥1 psychotropic drugs		133 [63,3%]
AP.	Antipsychotic drugs		100 [47,6%]
AD.	Antidepressant drugs		77 [36,7%]
BZ.	Benzodiazepines		66 [31,4%]
	Questionnaires (↑: higher is better, ↓: lower is better)		
PCRS	**Awareness discrepancy score (-120 – 120) ↓**	40,0 [20,0]	
AES	**Apathy Evaluation Scale (10-40) ↓**	25,4 [6,0]	
NPI	**Neuropsychiatric Symptoms ↓**		
NPI-P	Psychosis subscale (0-6)	0,85 [1,5]	
NPI-Ag	Agitation subscale (0-9)	3,2 [2,6]	
NPI-F	Anxiety subscale (0-3)	0,5 [0,95]	
NPI-Ap	Apathy subscale (0-3)	0,8 [1,0]	
NPI-D	Depression subscale (0-3)	0,81 [1,0]	
RISE	**Social participation (0-6) ↑**	4,25 [1,8]	
CPS	**Cognitive impairment (0-6) ↓**	2,55 [1,6]	
ADL	**Activities of daily living (0-6) ↓**	1,07 [1,2]	
IADL	**Instrumental activities of daily living (0-48) ↓**	39,0 [8,3]	
MANSA	**Quality of life (12-84) ↑**	61,0 [9,6]	

Figure 1. Resulting network.



Results

- Impaired awareness (PCRS) & apathy (AES) are central nodes in the network.
- **PCRS** is directly positively associated with higher levels of apathy (AES), impaired cognition (CPS) and quality of life (MANSA), yet also negatively with social participation (RISE) and duration of admission in LTCF (time).
- **AES** is also a central node. Higher scores relate positively to CPS, RISE and more physical dependence (ADL).
- Neuropsychiatric symptoms (NPI) are indirectly related to PCRS, through AES and RISE.

Conclusion

- Impaired awareness plays a central role in functioning and behavior of patients with KS living in specialized LTCFs.
- Network analysis is an interesting new technique to evaluate the interconnection of different impairments in diseases like KS.

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