

INTRODUCTION

As CRC patients often present with various symptoms and comorbidities, understanding the interrelationship between these factors is crucial for effective management and treatment (1). However, there is still a lack of studies using network analysis to elucidate the organic relationships between symptoms and comorbidities in CRC patients. Therefore, we aim to improve the quality of life of CRC patients by unraveling the complex interrelationship between their symptoms and comorbidities.

METHODS

In this study, we conducted symptom network analysis to explore the interactions between symptoms and functions based on comorbidities in colorectal cancer (CRC) patients scheduled for surgical treatment. A total of 987 CRC patients admitted to Seoul National University Cancer Hospital were included in the study and stratified according to demographic variables.

The EORTC QLQ-C30 and EORTC QLQ-CR29 questionnaires were used to assess symptom and functional variables. The EORTC QLQ-C30 includes several domains related to physical and emotional functioning, while the EORTC QLQ-CR29 focuses on colorectal-specific symptoms and functions.

To determine the relationship between comorbidities and symptoms and functions in CRC patients, we performed network and centrality analysis. We used the Fruchterman-Reingold algorithm (2).

A total of 987 colorectal cancer patients were included in the analysis. CRC patients were more male, older, more unemployed, had a higher body mass index, and had more comorbidities (Table 1).

Table 1. Characteristics of CRC patients

Colorectal Cancer Patients (n=987)	
Sex (N=960)	
Male	577(60.1)
Female	383(39.9)
Age (N=960)	
30-59	407(42.4)
60-89	553(57.6)
BMI (N=969)	
<23.5	431(44.5)
≥23.5	538(55.5)
FBS (N=872)	
<126	697(79.9)
≥126	175(20.1)
Marital Status (N=959)	
Single	143(14.9)
Married	816(85.1)
Job Status (N=951)	
Employed	444(46.7)
Unemployed	507(53.3)
Household Income (N=948)	
<1,500\$	277(29.2)
≥1,500\$	671(70.8)
Education (N=955)	
≤Middle school graduation	263(27.5)
≥High school graduation	692(72.5)
Residence (N=954)	
Urban	127(13.3)
Rural	827(86.7)
Comorbidity (N=987)	
Yes	596(60.4)
No	391(39.6)

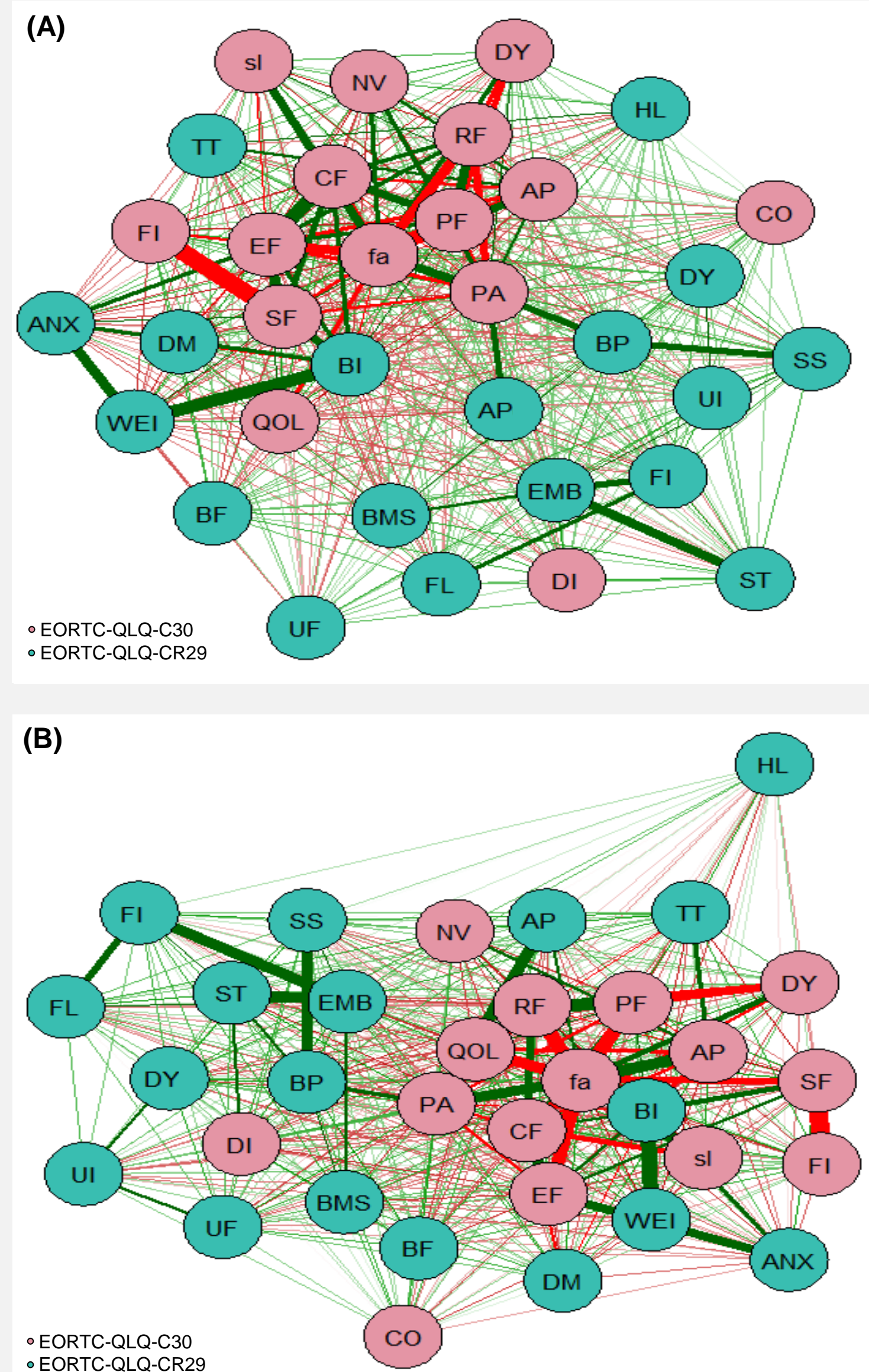
Symptom network analysis was performed based on the presence of comorbidities, and different network structures were identified. Among CRC patients without comorbidities, the strongest positive correlation was found between body image and weight concerns ($r=0.56$). Conversely, among CRC patients with comorbidities, the strongest negative correlation was observed between social functioning and financial difficulties ($r=-0.65$) (Figure 1).

RESULTS

Figure 1. Symptom and Function Network Structure according to comorbidity

(A) Symptom Network of CRC patients without comorbidities.

(B) Symptom Network of CRC patients with comorbidities.

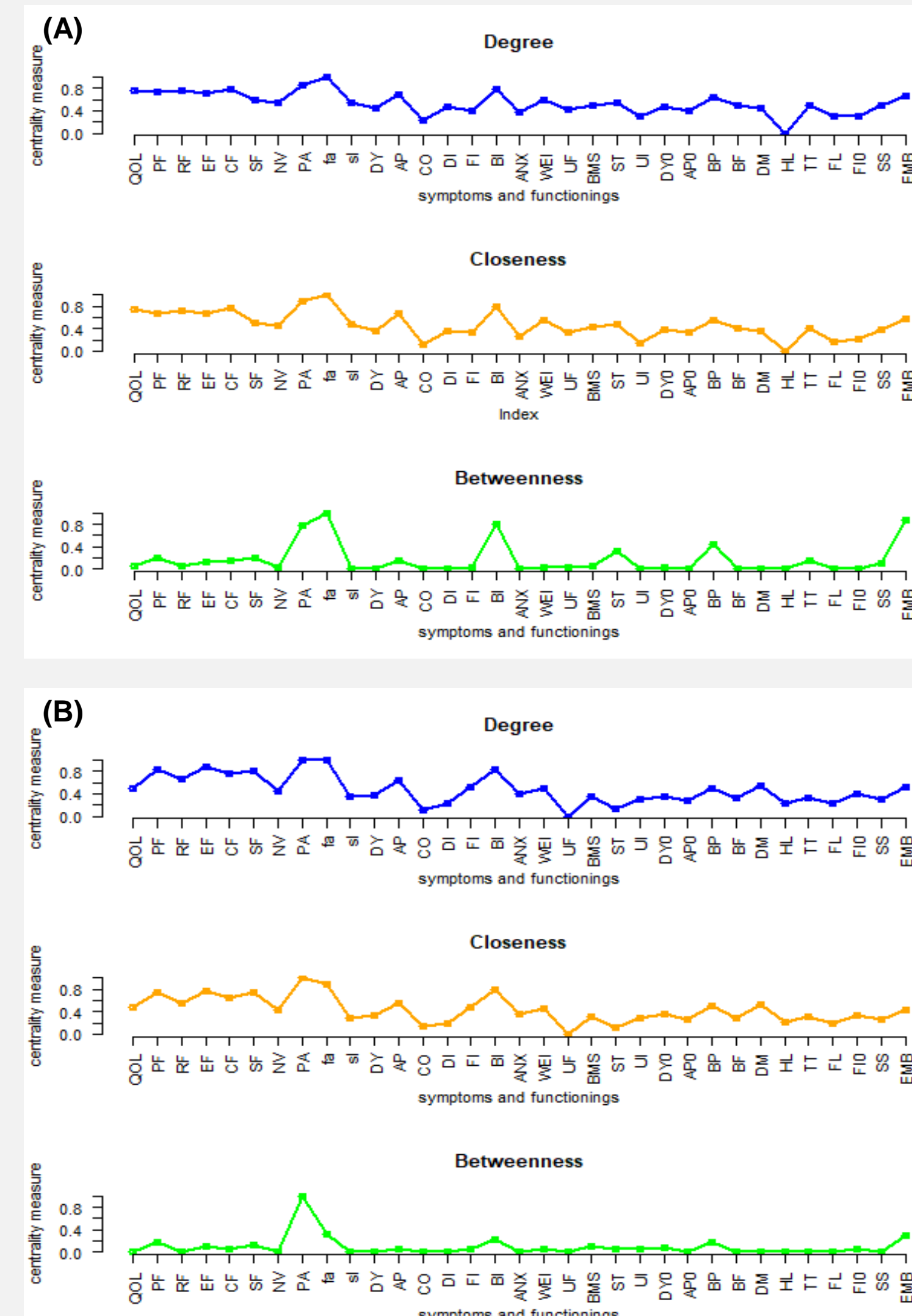


Centrality analysis was performed to identify central symptoms and functions based on comorbidity. Fatigue emerged as the central symptom in CRC patients without comorbidities, whereas pain was the central symptom in CRC patients with comorbidities (Figure 2).

Figure 2. Centrality plot according to comorbidity

(A) Centrality plot of CRC patients without comorbidities.

(B) Centrality plot of CRC patients with comorbidities.



CONCLUSIONS

Our results showed that symptom networks in CRC patients had different patterns and different central symptoms according to comorbidity.

These findings focus on the symptom and functional experiences of CRC patients and provide valuable insights for clinicians. Understanding these patterns by comorbidity may help to develop proactive strategies to optimise prognosis, improve symptom management and enhance overall patient care.

REFERENCES

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2. Jones PJ, Mair P, McNally RJ. Visualizing Psychological Networks: A Tutorial in R. Front Psychol 2018;9:1742.

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