



Quality of Is this the Real Life?

A Comparison of Health-Related Quality of Life Networks in Healthy Adults and Cancer Patients

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Introduction

Most analyses performed in **Health-Related Quality of Life (HRQoL)** research have been based on formative models. The 36-item Short Form Health Survey (SF-36), a commonly used instrument, is an example of this. Other research have been based (to a lesser extent) on reflective measurement models. The **network approach** has been introduced as a psychometric alternative to the reflective measurement model and the formative model. In a network, individual components of HRQoL are *part* of the construct, as the construct is understood as a network of mutually interacting variables that together form HRQoL.

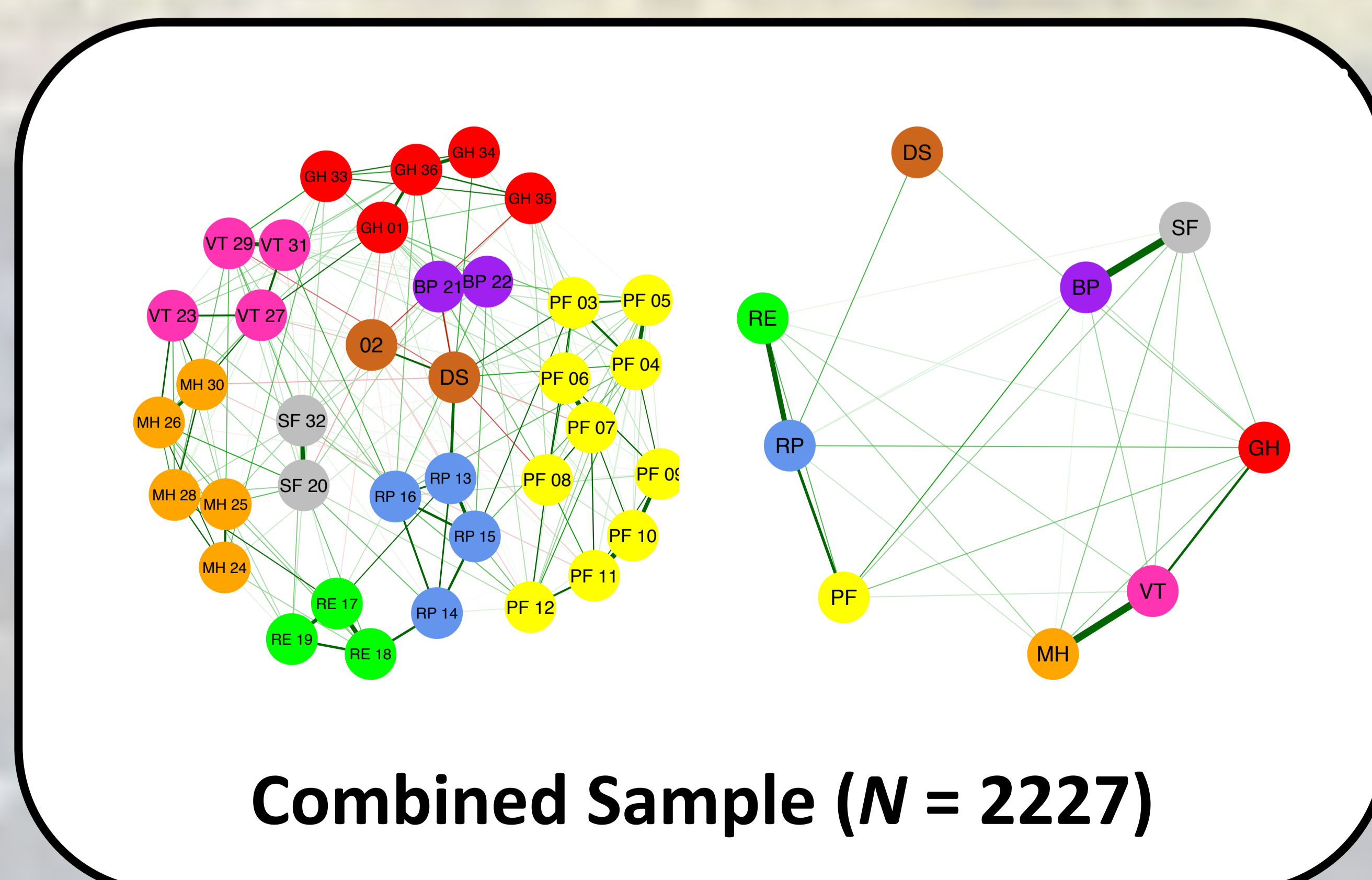
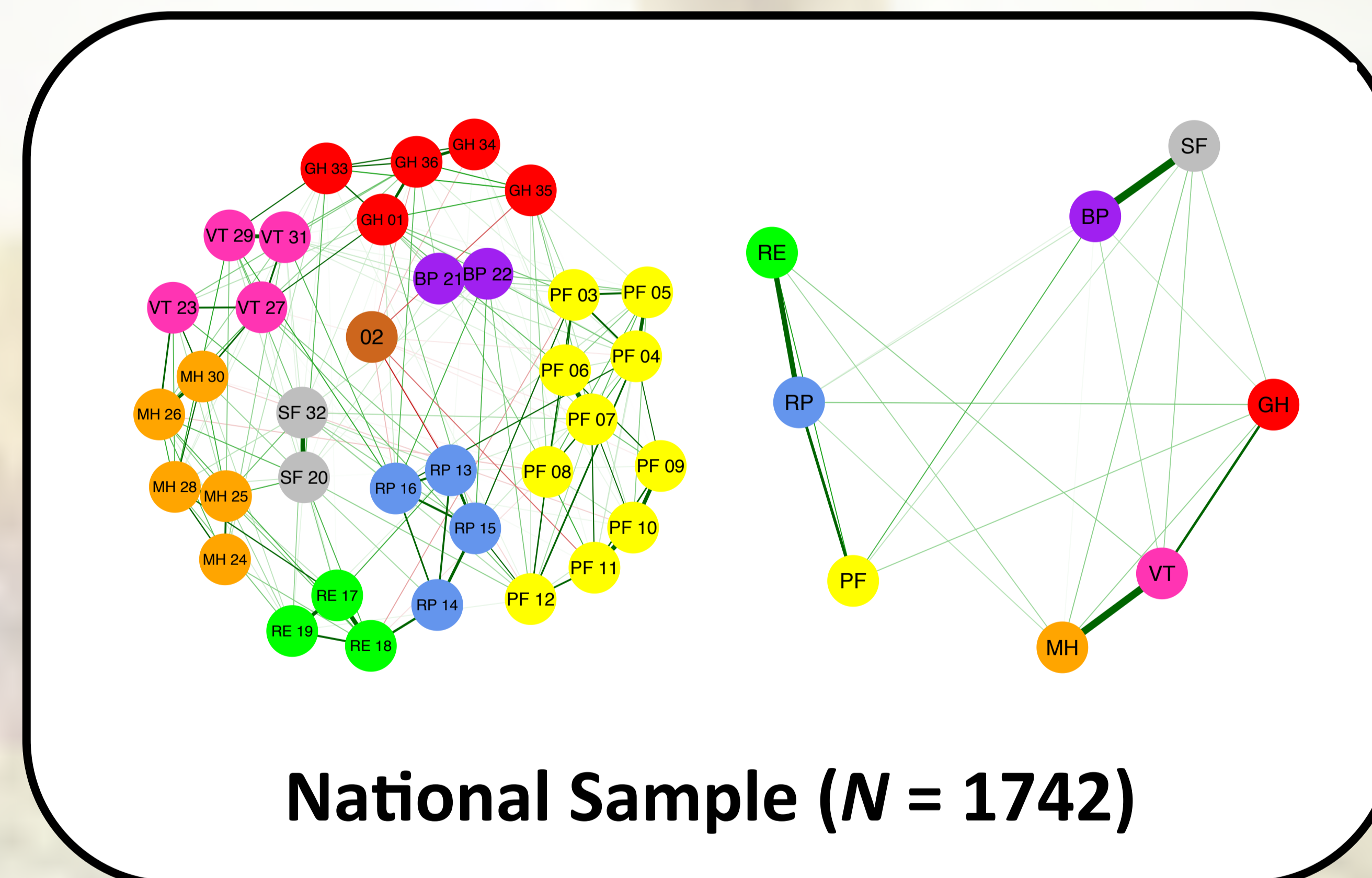
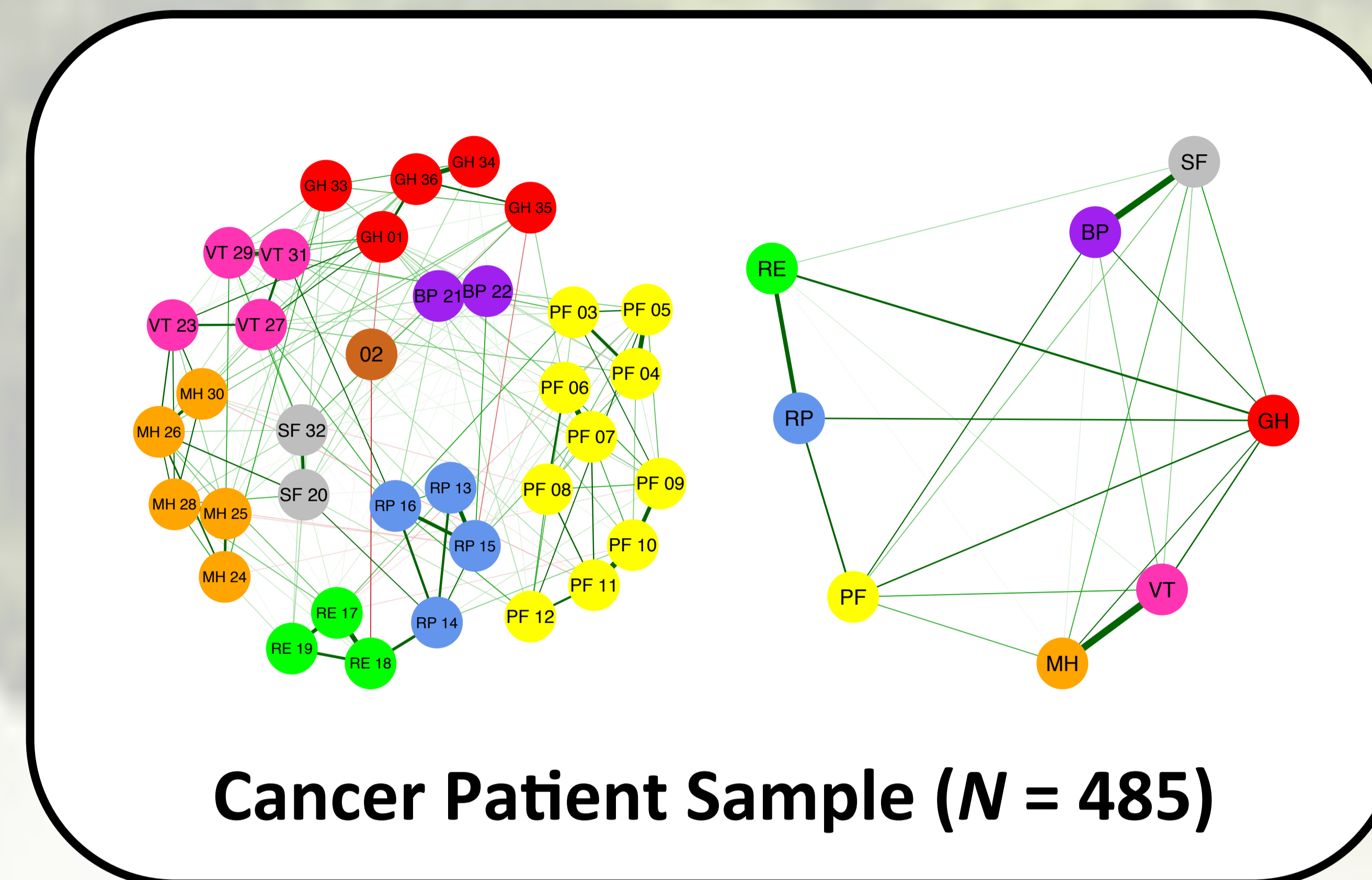
In this study, we aim to show how networks can be used to study how HRQoL may differ across subpopulations.

Goal

Determine whether network structures of the SF-36 on the item level and the domain level are similar across subpopulations such as cancer patients and healthy adults.

Method

We checked for differences in network structures by means of a **permutation test** (van Borkulo et al., 2015). The difference is defined as the deviation in absolute weighted sum scores of the connections. Participants from both samples were repeatedly (1000x) regrouped at a random basis. Difference scores were calculated and the resulting distribution under H0 is used to test the observed differences. Both weighted and unweighted network structures were compared.



Results

We estimated Gaussian Graphical Models combined with a graphical lasso for all samples on both the item level and the domain level. Networks of the cancer patient sample on the item level and the domain level were compared with networks of the national sample. Results showed that the item network structures were dissimilar ($p < .001$) when comparing weighted network structures. However, we could not find this dissimilarity when comparing the unweighted item network structures ($p = .056$).

We performed the same analysis for the domain network structures, we found that we could not reject the null hypothesis (both subsamples are equal) when comparing the weighted network structures ($p = .16$) as well as the unweighted network structures ($p = .18$).

Conclusion

The cancer patient network on the item level is similar to the national sample network with respect to the basic structure; their domain level networks were also similar with respect to its weights.

Discussion

The present study demonstrated a new approach for modeling HRQoL. The **item network structures** were found to be similar with respect to its basic structure, while the **domain network structures** were also similar with respect to its weights. We offered an important insight to understanding differential treatment effects or group differences in vulnerability. Future research may focus on relating the found network structure to networks that characterize other subpopulations.