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EMOTION REGULATION NETWORKS IN YOUTH WITH CHRONIC ILLNESSES: A NETWORK ANALYSIS

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Abstract

Chronic illnesses in youth affect not only physical health but also emotion regulation and psychological well-being. This study examined differences in emotion regulation networks between young individuals with chronic conditions and healthy peers. Data from 460 participants aged 8–25 years (160 with chronic illness, 300 healthy) were analyzed using Gaussian Graphical Models. Networks included cognitive emotion regulation strategies and symptoms of depression, anxiety, and stress. Results showed that the chronic illness group exhibited a more densely interconnected network, with maladaptive strategies strongly linked to depressive and anxiety symptoms. Adaptive strategies displayed lower centrality, suggesting limited regulatory influence. In contrast, the healthy network was less dense and more balanced, with adaptive strategies more central and weaker associations between maladaptive cognition and negative affect. Stress emerged as a key node in both groups, while irrational thinking acted as a bridging node in the chronic illness network. These findings highlight the role of maladaptive cognition in emotion regulation difficulties among youth with chronic illness and suggest potential targets for psychological interventions.

Keywords: *Emotion regulation, chronic illness, network analysis, youth.*

1. Introduction

Chronic illness in childhood and young adulthood imposes substantial psychological and social challenges alongside physical symptoms. Affected individuals often experience increased levels of anxiety, depression, and difficulties in emotion regulation (Katon, 2011; Pinquart, 2020), driven by factors such as chronic pain, disrupted routines, and family stress ((Mastorci et al., 2025).

Emotion regulation (ER) is a key developmental process linked to mental health outcomes (Silvers, 2022). Disruptions in ER are associated with heightened vulnerability to internalizing disorders, particularly during adolescence, a critical developmental period for emotional and neural maturation (Chaplin et al., 2021; Pozzi et al., 2021). However, traditional approaches often treat ER strategies as independent variables, overlooking their dynamic interactions.

Network analysis offers a framework for conceptualizing ER as a system of interconnected components, allowing the examination of how cognitive strategies and affective symptoms co-occur (Armstrong et al., 2016; Ruan et al., 2023). Comparing networks between youth with chronic illness and healthy peers may reveal distinct patterns underlying psychological vulnerability.

This study aimed to compare (1) overall network density, (2) associations between maladaptive strategies and affective symptoms, and (3) the centrality of adaptive strategies across groups.

Hypotheses:

H1: Higher network density in the chronic illness group.

H2: Stronger links between maladaptive strategies and anxiety/depression in the chronic group.

H3: Lower centrality of adaptive strategies in the chronic group.

2. Method

2.1. Participants

The sample included 460 participants aged 8–25 years (160 with chronic illness, 300 healthy). Chronic conditions included diabetes, asthma, and autoimmune diseases. Groups were age-matched.

2.2. Measures

Emotion regulation strategies were assessed using the Cognitive Emotion Regulation Questionnaire (CERQ; Garnefski et al., 2001). Affective symptoms were measured using the CASI and DASS-Y (Szabó & Lovibond, 2022).

2.3. Procedure

Data were collected online and in person. All participants provided informed consent (or parental consent for minors).

2.4. Data analysis

Gaussian Graphical Models were estimated using EBICglasso in R. Networks were computed separately for each group. Group differences were assessed using the Network Comparison Test. Centrality analyses focused on node strength. Stability was evaluated using bootstrap procedures.

3. Results

The chronic illness network was more densely connected than the healthy network, supporting H1. Depression and anxiety formed the strongest association in both groups, but connections between maladaptive strategies (e.g., rumination, catastrophizing, self-blame) and affective symptoms were stronger in the chronic group, supporting H2.

Centrality analyses showed that stress was the most central node in both networks. In the chronic illness group, maladaptive strategies such as rumination and self-blame exhibited high centrality, while adaptive strategies showed reduced influence, supporting H3.

Irrational thinking emerged as a key bridging node in the chronic illness network, linking cognitive strategies and emotional symptoms. In contrast, the healthy network displayed a more balanced structure, with weaker and more flexible connections.

Bootstrap analyses confirmed the stability of the strongest edges, particularly in the chronic illness network.

4. Discussion

This study examined emotion regulation as a network of interacting cognitive and affective components in youth with chronic illness compared to healthy peers. The findings indicate that chronic illness is associated with a more densely interconnected and less flexible emotional-cognitive system.

Maladaptive strategies were strongly linked to depressive and anxiety symptoms, suggesting mutually reinforcing processes that may sustain psychological distress, in line with previous research on cognitive emotion regulation (Garnefski et al., 2001) and network models of psychopathology (Ruan et al., 2023).

Stress emerged as a central node across groups, highlighting its importance as a transdiagnostic factor (Katon, 2011). Additionally, irrational thinking functioned as a bridge in the chronic illness network, suggesting a potential target for interventions, consistent with evidence on cognitive mechanisms underlying emotional disorders (Silvers, 2022).

These findings have clinical implications, indicating that interventions should focus on reducing maladaptive cognitive strategies while strengthening adaptive regulation skills.

Limitations include the cross-sectional design and smaller clinical sample. Future longitudinal research is needed to clarify causal dynamics.

5. Conclusion

Youth with chronic illness exhibit a densely interconnected emotion regulation network characterized by strong links between maladaptive cognition and negative affect. Network analysis provides a useful framework for identifying key intervention targets and understanding psychological vulnerability in this population.

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