**The Diagnostic Conundrum: Neurobiological, Cognitive, and Developmental Factors in Dyscalculia Identification**

Yılmaz Mutlu, İhsan Söylemez, Ali Fuad Yasul

Muş Alparslan University

**Presenter**

Yılmaz Mutlu

**Purpose**

This review examines the multifaceted challenges in diagnosing developmental dyscalculia (DD), a specific learning disorder affecting 3-7% of the population. Despite its significant impact on academic, social, and professional outcomes, there remains no consensus on diagnostic criteria. We analyze the key factors complicating diagnosis, including heterogeneous cognitive profiles, high comorbidity rates, inconsistent assessment approaches, and neurobiological factors, to establish a foundation for improved diagnostic processes.

**Method**

A comprehensive review of research on dyscalculia diagnosis was conducted, examining studies on cognitive profiles, comorbid conditions, diagnostic criteria, assessment tools, and neurocognitive foundations. We analyzed discrepancies in definitional frameworks, including differences between absolute threshold versus discrepancy-based approaches, and evaluated the psychometric properties of commonly used assessment methods. Neuroimaging and genetic studies were included to provide insights into underlying mechanisms.

**Results/conclusions**

Our findings reveal seven key factors complicating dyscalculia diagnosis: (1) heterogeneous subtypes with different cognitive profiles, (2) high comorbidity rates (20-60%) with other neurodevelopmental disorders, (3) inconsistent diagnostic criteria and approaches, (4) diverse measurement tools with varying psychometric properties, (5) the multidimensional structure of mathematical abilities, (6) complex interactions between domain-specific and domain-general cognitive factors, and (7) developmental changes affecting symptom presentation. We recommend multidimensional assessment approaches and consideration of developmental trajectories for more accurate diagnosis and targeted interventions.

**Oral presentation preferred**

**Subject area: Dyscalculia**