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## Role of Gut Microbiota in Type 2 Diabetes Mellitus

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**Statement of the Problem:** Type 2 Diabetes Mellitus (T2DM) is a global health issue characterized by insulin resistance and hyperglycemia. Emerging evidence highlights the role of gut microbiota in metabolic disorders, including T2DM. However, the exact mechanisms remain poorly understood.

**Methodology & Theoretical Orientation:** This study employed metagenomic sequencing and metabolomic profiling of stool samples from 120 participants, divided equally into T2DM patients and healthy controls. Data were analyzed to identify microbial composition and associated metabolic pathways.

**Findings:** T2DM patients exhibited significant dysbiosis, with reduced levels of beneficial short-chain fatty acid-producing bacteria and an increase in pro-inflammatory microbes. Metabolic pathway analysis revealed alterations in amino acid and bile acid metabolism linked to insulin sensitivity.

**Conclusion & Significance:** The study underscores the potential of targeting gut microbiota for T2DM management. Probiotics and dietary interventions could serve as promising therapeutic strategies.

### Biography

Dr. Ayesha Khan is an expert in microbiome research and its implications for metabolic disorders. With over a decade of experience in clinical and translational research, she has authored multiple high-impact publications on gut microbiota and its role in chronic diseases. She is a passionate advocate for integrative healthcare approaches that incorporate microbial science into therapeutic strategies.

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