

Combined Resistance Training and Dietary Protein Supplementation Interventions in Type 2 Diabetes: A Scoping Review

Matthew Helou¹, Dylan Moran¹, Christina Johnson², Nicholas Sculthorpe³, Elise Brown²

¹Oakland University William Beaumont School of Medicine

²School of Health Sciences, Oakland University

³University of the West of Scotland, School of Science and Sport

Introduction

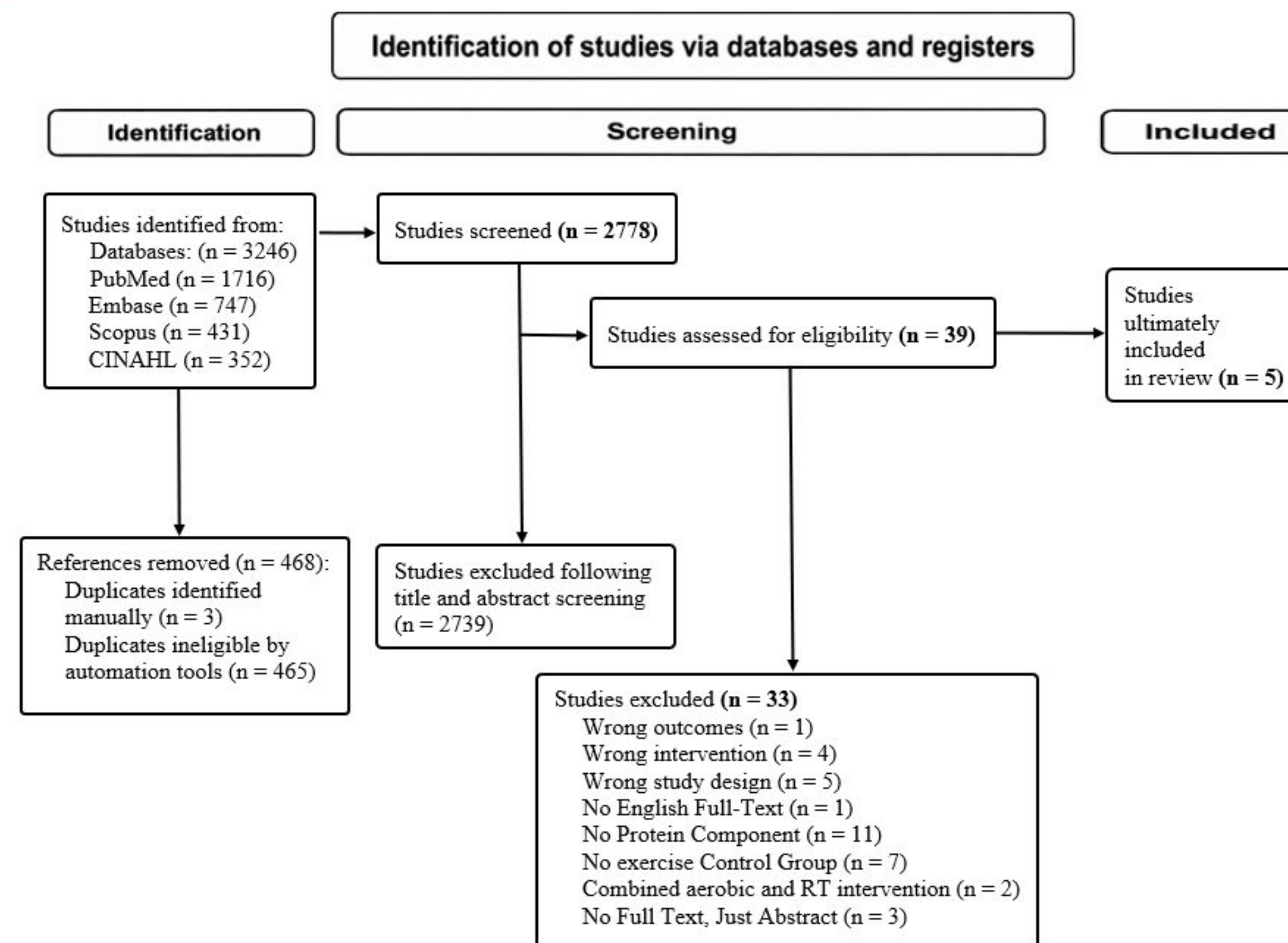
- Type 2 diabetes mellitus (T2D) is a chronic condition marked by impaired glucose metabolism and insulin resistance.¹
- Resistance training (RT) and dietary protein (DP) independently improve glycemic control, yet their combined effects remain incompletely characterized.^{14, 15, 19}
- This study aimed to determine the impact of RT + DP on glycemic control and cardiometabolic outcomes in adults with T2D.

Aim and Objectives

- To assess the effects of combined RT + DP interventions on glycemic control, namely HbA1c and fasting plasma glucose.
- To secondarily evaluate body composition changes, muscular strength changes, functional outcomes changes, cardiometabolic risk markers, and renal safety outcomes.
- To identify gaps, heterogeneity, and limitations in the existing literature to inform future directions.

Methods

- This review followed the Joanna Briggs Institute (JBI) framework for scoping reviews and PRISMA-ScR guidelines.^{28, 29}
- A comprehensive search of PubMed, Embase, CINAHL/SportDiscus, and Scopus (from inception to February 2026) identified randomized controlled trials (RCTs) evaluating RT + DP interventions in adults living with T2D.
- Eligible studies included an RT-only comparator group and reported outcomes related to glycemic control and secondary variables.
- Two reviewers independently screened records with disagreements resolved by a third reviewer.

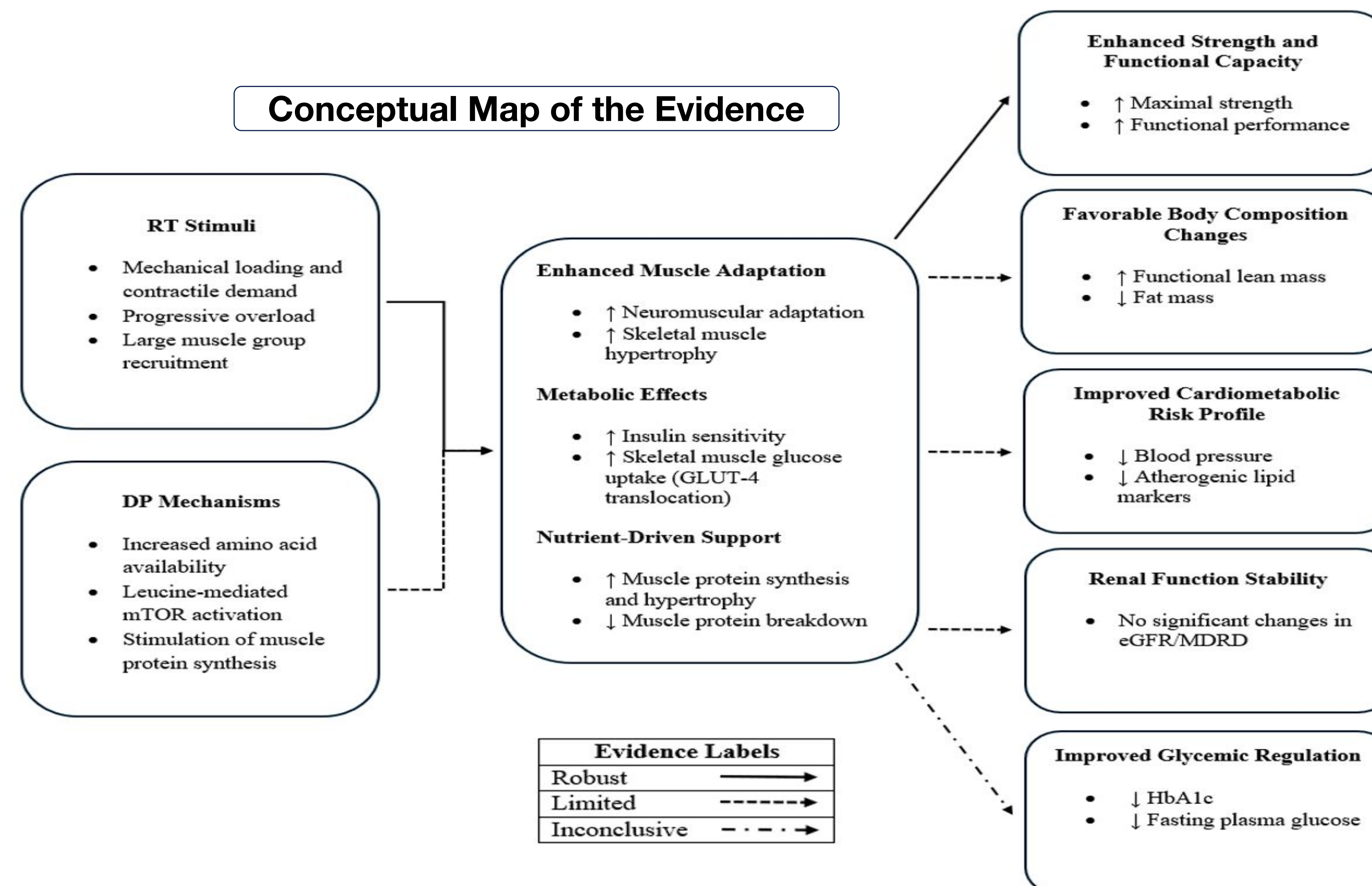


Results

- Ultimately, 5 RCTs involving 229 participants met inclusion criteria.
- Across studies, RT + DP interventions were 12–48 weeks in duration and used whey protein, leucine-enriched supplements, or high-protein diets alongside structured RT programs.^{27, 34-35}
- The evidence suggested that RT + DP improved muscular strength and lean mass, but these improvements were comparable to RT alone.
- Glycemic outcomes such as HbA1c and fasting glucose generally showed no added benefit from DP beyond RT.
- Body composition changes were modest across all groups, and no study reported adverse renal effects associated with increased protein intake.

Conclusion

- The current evidence suggests that RT + DP does not meaningfully enhance glycemic control, anthropometric, strength, or cardiometabolic outcomes beyond the effect of RT alone in adults living with T2D.
- Both interventions appear safe and well-tolerated.
- Due to the limited number of trials and heterogeneity in DP formulations and RT protocols, further high-quality studies are needed to clarify the potential synergistic effects of RT + DP in this population.



References

Please scan QR code for access to our references document online.