Weight Reduction in Behavioral and Pharmacological Randomized Controlled Trials in Children and Adolescents: A systematic review and meta-analysis

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Introduction

- **Intensive Health Behavior Lifestyle Treatment (IHBLT)** is the foundation of pediatric obesity care.
- The American Academy of Pediatrics (AAP) 2023 Clinical Practice Guideline (CPG) recommends **≥26 contact hours of IHBLT over 3–12 months** to achieve clinically significant weight reduction. [1]
- **Pharmacologic therapy**, including recently approved GLP-1 agonists, is recommended as an adjunct to health behavior lifestyle treatment (HBLT) for eligible youth ≥12 years.
- **Evidence gap**: The expected rate of weight change with IHBLT and pharmacotherapy remains uncertain, creating challenges for families and providers when reviewing treatment options.

Methods

- **Systematic Review** of randomized controlled trials (RCTs) in youth (ages 2-18)
- **Inclusion criteria**: IHBLT ≥26 hours and/or pharmacotherapy + lifestyle treatment
- **Sources**: 2023 AAP Clinical Practice Guidelines systematic review,[2] U.S. Preventative Service Task Force (USPSTF) recommendation statement,[3] PubMed/MEDLINE (2019–2025)
- **Pharmacotherapy categories**:
  - *First generation*: Metformin, Orlistat, Topiramate, Sibutramine
  - *Second generation*: Liraglutide, Semaglutide, Phentermine, Dulaglutide, Exenatide
- **Analysis**: Random-effects meta-analyses → pooled effects on weight, BMI, BMI z-score

Results

Characteristics of Included Studies by Intervention

	N Trials	*Trials Reporting BMI Change*	*Age (y) Intervention*	*Age (y) Control*	*Baseline BMI Intervention*	*Baseline BMI Control*
First Generation Pharmacotherapy with HBLT	34	18	13.51	13.11	33.2	32.8
Second Generation Pharmacotherapy with HBLT	13	8	14.26	14.18	34.3	34.7
IHBLT without Pharmacotherapy	42	22	10.17	10.21	29.1	29.3

Pooled Effects of IHBLT and Pharmacotherapy on BMI

	N Trials	*Weighted Change in BMI (kg/m²)*	*SE*	*P*	I^2
First Generation with HBLT	18	-1.36	0.22	0.0001	85.77
Second Generation with HBLT	8	-1.53	0.52	0.0022	94.7
IHBLT	22	-0.75	0.23	0.0038	93.2

Pooled Effects of IHBLT and Pharmacotherapy on Weight

	N Trials	*Weighted Change in Weight (kg)*	*SE*	*P*	I^2
First Generation with HBLT	14	-2.88	0.8	0.0032	94.7
Second Generation with HBLT	7	-4.25	1.09	0.0079	91.54
IHBLT	153	-0.41	0.53	0.4503	95.26

Pooled Effects of IHBLT and Pharmacotherapy on BMI z-score

	N Trials	*Weight Change in BMI z-score*	*SE*	*P*	I^2
First Generation with HBLT	15	-0.15	0.05	0.0064	96.14
Second Generation with HBLT	1	-0.23			0
IHBLT	29	-0.24	0.05	0.0001	98.46

Conclusion

- These preliminary findings highlight the amount of average weight loss over 1-year from IHBLT and pharmacotherapy.
- **Further analyses** are needed to assess subgroup differences (age, baseline BMI, other characteristics).
- **Clinical impact**: These preliminary findings, combined with planned subgroup analyses, will provide families and providers with evidence-based expectations for weight loss achievable through each approach.

References

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