

Establishing the Limitations of Research regarding Obesity among Youth with Disabilities: a Narrative Literature Review

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Abstract

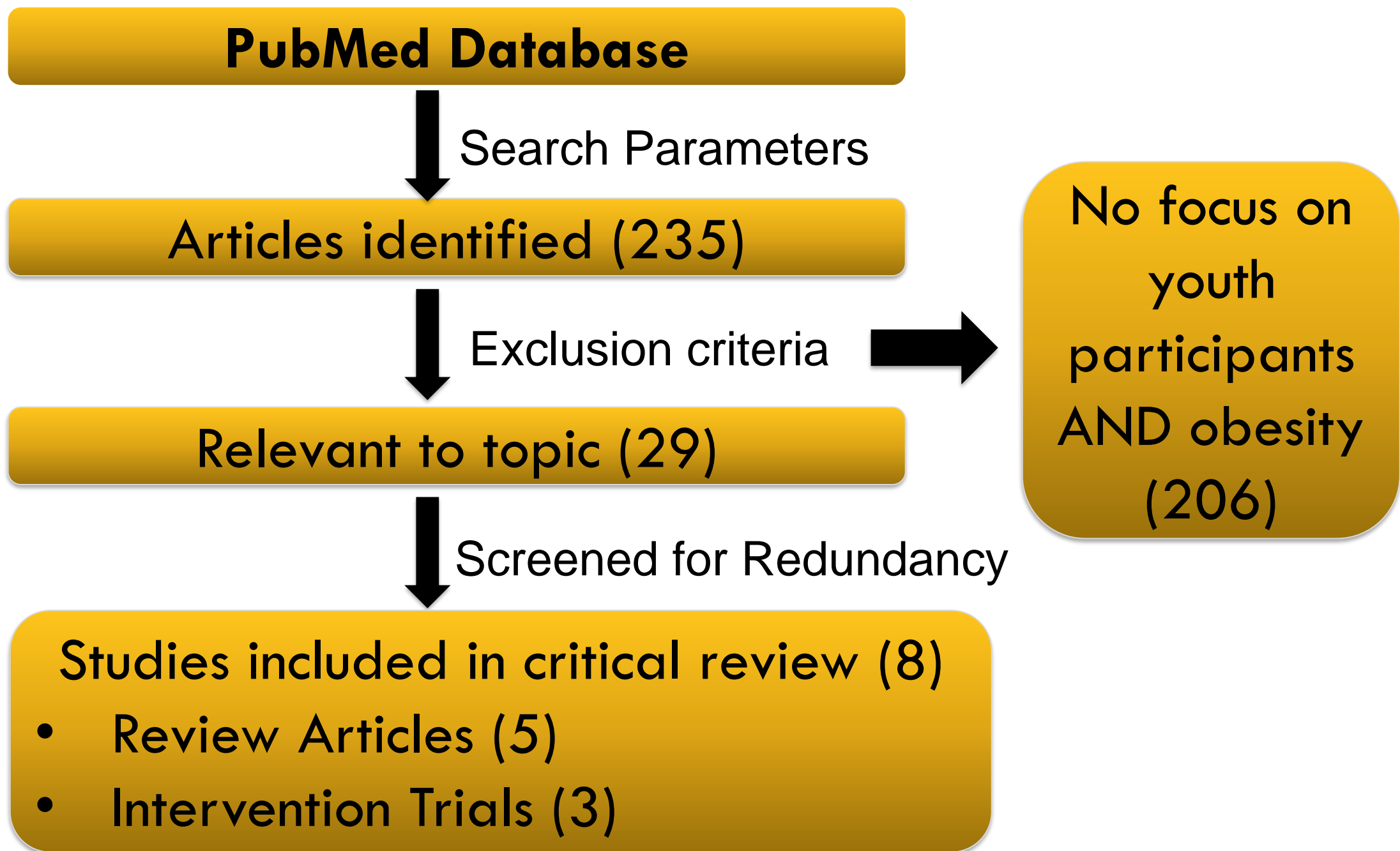
Obesity in children is increasingly prevalent in the United States, with 2x-5x higher rates observed in children with an intellectual or developmental disability. Through a narrative literature review, this study outlines the limitations of interventions for this group. Through examination of included articles, data exist on numerous interventions for this group; however, this data continues to be underpowered, varied by diagnosis, and a lack of practice-based guidelines endures.

Introduction

- Over 1/3 of children and adolescents in the United States have overweight or obesity.^[1] Even higher rates exist among youth with intellectual and developmental disabilities (IDD), as high as 70-86% in groups with syndromic obesity.^[2]
- Specific groups with increased risk include: Autism Spectrum Disorder (ASD), Down Syndrome (DS), Prader-Willi Syndrome (PWS), & Bardet-Biedl Syndrome (BBS).
- Risk factors include food selectivity, hyperphagia, psychotropic medication use, increased sedentary behavior, and genetics.
- Our aim is to examine the current literature to better outline these limitations.

Material and Methods

PubMed database was searched from 2010 to October 2020 for relevant articles. Narrative review was conducted to summarize and evaluate data.



Results

- Of 28 intervention trials represented in the review articles, 11 (39%) had <10 individuals, 24 (86%) had <100.^[3,4,5,6,7]
- Few trials (20%) compared interventions to a control group of children without IDD or syndromic obesity.
- Two of the reviews (Abeysekara et al., Crino et al.) synthesized risk factors and intervention recommendations for their specific demographic in narrative fashion.^[3,4]
- Healy et al. used a peer-reviewed quality appraisal tool and found only one clinical trial to be *Strong*.^[5]
- Consensus recommendations suggest establishing a family-centered medical home, utilizing multidisciplinary teams (dietitian, psychologist, physician), incorporating technology, and considering bariatric surgery when medical criteria are met.

Table 1. Select characteristics of review articles

	Clinical Diagnoses	Interventions	N Range (total)	Ages (years)	Dates reviewed	Quality Appraisal	Notable qualities
Abeysekara et al. 2014	CYSHCN	Family-centered care, medical home, PA	NP	NP	1998-2017	No	ICF model recommended as guiding framework for disability classification, narrative review
Walker et al., 2018	IDD, ASD, DS, physical disability	Multi-disciplinary diet/PA program, technology delivered diet program, retrospective review of Brenner FIT program	21-453 (734)	2-19	2014-2017	No	Largest aggregate sample across IDD studies. Significant heterogenous sampling.
Crino et al., 2018	PWS	Behavioral intervention, medications, bariatric surgery	NP	NP	1983 -2018	No	Robust PWS pathophysiology, pharmacology, interventions, Narrative review
Healy et al., 2019	ASD	Nutrition, PA, motivational interviewing, medications	1-115 (393)	2-20	2011-2017	Yes	Significant overrepresentation of males in studies reviewed
Matheson et al., 2019	PWS, BBS, DS, ID/D	Bariatric Surgery	1-24 (89)	4-24	1980-2019	No	80% sample represented by PWS. Minimum age was 4, though majority were >10.

CYSHCN – Children/Youth with Special Health Care Needs; PA – physical activity; NP – not presented; ICF – International Classification of Functioning

Table 2. Select characteristics of individual intervention studies

	Clinical Diagnoses	Intervention	N	Ages (years)	Outcomes (primary result)	Notable qualities
Wu et al., 2017	IDD, DS, ASD	[RCT] 12 weeks; Prescriptive cross-circuit training sessions utilizing bodyweight exercises, balance boards, and treadmill	43	13-19	Weight loss (-1.640 kg [-4.204 to 0.924, 95% CI] vs control), Muscular endurance, Maximal heart rate, Balance	ICF-CY standardization used; secondary disabilities (DS, ASD) not included in analysis
Rubin et al., 2019	PWS	[RCT] 24 weeks; Pre-planned, parent-led PA sessions including use of sports equipment, playgrounds, and Nintendo Wii.	111 (45 PWS)	8-16	BMI change (Increase in BMI of control group from baseline to 24 wks [28.49 ± .63 to 28.98 ± .70 kg/m ² ; p = 0.32] not shown in PWS group) Lean body mass, Duration of physical activity (min/day), Blood pressure, resting HR, QOL measures	No significant outcomes aside from QOL. However, secondary analysis of PA showed improved weight outcomes in those with increased activity.
Liu et al., 2020	PWS	[Prospective Observational] Bariatric Surgery and multidisciplinary follow-up program	5	15-23	%Total weight loss (24.7% at 2 years; 11.9% at 5 years; 0% at 10 years), Comorbidity resolution	10-year observational study post-bariatric surgery

QOL – quality of life; ICF-CY – International Classification of Functioning, Disability and Health for Children and Youth Framework

Conclusion

- Multiple contemporary reviews exist on weight management in youth with IDD.
- Despite this, sample sizes are limited. The low incidence of certain IDD etiologies (i.e. genetic syndromes) directly impacts this.
- IDD is highly heterogeneous. Studies often do not differentiate by participant diagnosis, which may impair the development of tailored weight management interventions.
- A consensus among authors was that positive outcomes were consistently observed in the setting of comprehensive, multidisciplinary team interventions.
- Well-powered, controlled intervention trials are needed to inform future guidelines.

Limitations of this Project

- This literature review only spanned one database.
- The reviews reported on covered numerous topics within a heterogenous group, limiting specificity and external validity of conclusions.
- No quantitative analysis was conducted of the three unique intervention trials.

Conflicts of Interest & Funding

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