

Preventing Obesity among Adolescents

Subjects: Nutrition & Dietetics

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Some authors do understand that the concept of obesity must be a combination of at least BMI over the second standard deviation for age and gender, with some body composition evaluation, as waist/height relation, neck circumference or physical methods to analyse fat deposition (absorciometry or pletismography, and in more debatable concerns impedanciometer (tetrapolar), skin folder measurements or summ of perimeters.

Keywords: Body compostion, anthropometry, obese definition

1. Definition

The World Health Organization (WHO) defines pediatric obesity as a body mass index (BMI) at or above the 95th percentile among children and adolescents of the same age and sex, often measured on BMI growth charts.

2.Introduction

Prevention programs that include diet, physical activity (PA), and/or sedentary behavior components are currently the first line of prevention for obesity in adolescent youth ^[1]. However, focusing on diet and PA may increase the risk for eating disorders. In this approach, individuals should decrease their caloric intake and increase their levels of PA, which may encourage them to diet. Evidence has shown that the majority of individuals with eating disorders reported that they started to diet before they initiated their disordered eating behaviors ^[2]. The WHO Commission on Ending Childhood Obesity report ^[3] suggest a multi-component approach that includes comprehensive lifestyle weight-management support for youth who have an unhealthy weight status as part of a universal youth healthcare plan. Multidisciplinary prevention programs do not have a specific definition. However, the WHO report ^[3] noted that a comprehensive prevention plan should include psychosocial and family support in addition to common components such as nutrition and PA or sedentary behavior change.

“Energy-balance” programs have a starting point on outcomes of weight gain resulting in increased caloric intake and/or decreased energy expenditure. The major components targeted are sources and amounts of foods and beverages, while energy expenditure is mainly guided by PA and metabolic rates ^[4]. On the other hand, “shared risk for obesity and eating disorders” programs focused on maintaining a positive relationship between food and weight through a more mindful approach in order to promote sustainable lifestyle changes ^{[5][6]}.

Thus, it is important to examine the implications of the aforementioned strategies and their impact on disordered eating risk factors and obesity prevention among adolescent youth in order to build a more sustainable approach through the integration of diet and PA components with psychosocial support.

3. energy-balance and shared risk factors for obesity and eating disorders

3.1. Energy-Balance Programs

For the energy-balance programs, 20 studies were found ^{[7][8][9][10][11][12][13][14][15][16][17][18][19][20][21][22][23]}; of these, five studies were conducted in the USA ^{[18][19][20][22][23]}, four in Australia ^{[24][25][26][27]}, three in Asia ^{[28][29][30]}, and one in Brazil ^[31] and in Tonga ^[32]. When considering the study design, 13 studies were randomized controlled trials (RCT) ^{[33][26][27][34][35][12][13][29][17][18][19][20][22][23][36]}, four were quasi-experimental trials ^{[8][11][14][32]}, and one non-randomized controlled trial ^[17]. Two studies were one-group pre- and post-test assessments ^{[37][23]}. The sample size for the energy-balance programs ranged from 51 ^[19] to 3638 ^[38] and the mean age was 12.7 ± 1.8 years old. Two targeted only females ^{[26][19]} and one only males ^[25]. Eight studies reported following a theoretical basis, with six studies following the Social Cognitive Theory ^{[25][26][27][18][20][22]}, and two the Self-Determination Theory ^{[25][18]}.

3.2. Shared Risk Factors for Obesity and Eating Disorders Programs

With regards to the “shared risk factors for obesity and eating disorders” programs, fifteen studies were included in this systematic review [39][40][41][42][43][44][45][36][46][47][48][49][50][51][52]. Seven studies were conducted in the USA [36][46][48][50][51][52], two in Spain [42][43] and in Brazil [53][41], and one in Australia [40], Canada [44], and Mexico [45]. The programs included nine RCT [39][41][36][47][48][49][50][51][52], three quasi-experimental trials [42][43][45], one non-RCT [44], and one one-group pre- and post-test assessment [46]. The sample size ranged from 27 [46] to 1451 [50] adolescents participating in the shared risk factors for obesity and eating disorders program, with 15.1 ± 2.6 years old as the mean age of the participants. Six targeted only females [39][41][42][45][36][46][51]. From a theoretical approach, five was based on Social Cognitive Theory [39][41][43][36][49] and eight combined educational techniques with changes in the environment [39][41][42][44][36][50][51][52]. This was followed by focusing on approaches to reduce the risk for eating disorders, such as Media Literacy [40][42][43], Dissonance Behavioral Intervention [42][46], and Interpersonal Therapy [52].

3.3. Outcomes

3.3.1. Energy-Balance Programs

Ten studies [24][26][27][37][38][12][13][14][17][23][54] showed small improvements on youth weight status as measured by BMI, the BMI z-scores, or percent prevalence for being overweight/obese. A reduction was observed by a difference between groups (intervention vs. control) of at least 0.1 kg/m², or by a 1.7% decrease on the prevalence of being overweight/obese from baseline to post-intervention/follow-up assessments. Five studies [25][26][55][29] did not find any significant effects on weight status change, while three studies [31][35][32] showed an increase in weight status change. Four studies (20.0%) [26][31][32][18] did not find significant differences in diet outcomes after the intervention, which included the reduction of total energy intake and improvement on the intake of certain food groups (e.g., fruit and vegetables). However, five studies (25.0%) [25][27][55][19][22] showed an improvement in the intake of sugar-sweetened beverages, as well as fruit and vegetables. PA level was improved in four studies (20.0%) [31][55][12][22] with an average of +12.5 min/week. Three studies [55][17][22] evaluated the participants' knowledge of nutrition and PA, and found significant improvements in their knowledge. Three studies [14][22][23] assessed the biological markers to verify the improvements in lifestyle behaviors, including blood pressure and fasting capillary plasma. Significant results were found among male participants with a higher BMI and older adolescents.

3.3.2. Shared Risk Factors for Obesity and Eating Disorders Programs

All 14 studies showed no significant effects on weight status post-intervention. Two programs [44][46] showed an increase in BMI and weight from post-intervention to follow-up. This increase in BMI ranged from 0.2 to 0.4 kg/m², reflecting on average increase of 2.9 kg. Leme et al. [39], although not finding significant results for BMI, found that results favored the intervention group ($\Delta = -0.26$ kg/m²), with a lower increase in waist circumference for both groups. Female participants with high levels of anxiety demonstrated stabilization in adiposity (% body fat). Moderation analyses also indicated a stronger BMI effect for youths with initially elevated symptoms of eating disorders and higher initial BMI scores [48][49], as well as for weaker eating disorder symptoms and body image dissatisfaction [48].

Six studies [40][43][36][46][50][51] also found a reduction in several risk factors that were sustained at follow-up; specifically, eating pathology, appearance satisfaction, a thin ideal, negative affect, and emotion dysregulation. Two studies [45][49] that targeted both sexes found an interaction effect for time and group in thin idealization, but disordered eating attitudes/behaviors for females only. Leme et al. [39] and Sanchez-Carracedo et al. [42] found that results for eating disorder risk factors were in the opposite hypothesis direction, including results for appearance attitudes, eating disorders symptoms, and unhealthy weight control behaviors (e.g., skipped meals, eating very little, and fasting).

Leme et al. [39], Simpson et al. [46], and Neumark-Sztainer et al. [36] were the only studies that assessed the dietary intake, PA, and sedentary behaviors of the participants. These two studies showed an improvement in healthy eating and PA. Both showed that social support, particularly for the family, was improved after intervention along with other socio-cognitive aspects.

4. Conclusions

This systematic review showed that energy-balance interventions produced better results on weight outcomes when integrating physical activity associated with changes in school or other community environments. Improved disordered risk factors were seen in the shared risk factors, e.g., weight-control behaviors and shape and weight concerns, especially among overweight adolescents. However, some studies found non-significant effects or even an increased risk of these shared risk factors at the post-intervention stage among adolescent girls, suggesting that a more intensive or targeted

approach may be needed for this at-risk group. These findings may suggest that efficacious approaches to support a sustainable weight status, by integrating the risk factors for eating disorders with changes in the environment, could promote healthy lifestyle behaviors, especially regarding diet and physical activity. However, more research is needed to examine how a shared risk factor approach can address both obesity and eating disorders, as well as to identify whether additional support is needed for adolescent girls.

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