



RESEARCH ARTICLE

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## EDUCATIONAL INTERVENTIONS USED FOR WEIGHT LOSS IN OVERWEIGHT OR OBESE ADOLESCENTS: INTEGRATIVE REVIEW

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### ARTICLE INFO

#### Article History:

Received 19<sup>th</sup> November, 2019  
Received in revised form  
17<sup>th</sup> December, 2019  
Accepted 28<sup>th</sup> January, 2020  
Published online 27<sup>th</sup> February, 2020

#### Key Words:

Food and nutrition education;  
Health education;  
Educational technology;  
Weight loss; Teens

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### ABSTRACT

**Objective:** to analyze the evidence available in the literature on educational interventions used for weight loss in overweight or obese adolescents. **Method:** this is an integrative literature review that used the PICO strategy to elaborate the guiding question: "What is the evidence available in the literature about educational interventions used for weight loss in overweight and/or obese adolescents?" Primary studies were researched in the Medical Literature Analysis and Retrieval System Online (Medline), Latin American and Caribbean Health Sciences Literature (LILACS), and Scientific Electronic Library Online (SciELO) databases. **Results:** seven articles were selected. The synthesis of the evidence pointed to the different interventions that can be used for weight loss in overweight or obese adolescents. Regarding the type of educational intervention proposed, nutrition education workshops and lectures on healthy eating and practice of physical activity stood out. There was a significant reduction in body mass index (BMI) and weight in all studies except one. **Conclusion:** educational interventions have positive results in weight reduction or BMI in overweight or obese adolescents.

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Citation: Raidanes Barros Barroso, Fabricia Silvana Sarmiento dos Santos, Marcelino Santos Neto, Ana Lucia Fernandes Pereira et al. 2020. "Transnasal endoscopic treatment of choanal atresia", *International Journal of Development Research*, 10, (02), 33665-33669.

## INTRODUCTION

Adolescence, a phase between the ages 10 and 19 years, is marked by numerous physical and behavioral changes and several factors can influence the preferences and lifestyle of this population, since the habits acquired will constitute the identity of this public, often characterized by unhealthy behaviors (WHO, 2004). Worldwide, in recent decades, changes in lifestyle have contributed to the increased prevalence of overweight and obesity in adolescents. Recent studies conducted in both developed and developing countries have confirmed that, reporting diets rich in sodium, processed foods and fast foods coupled with a progressive decreased intake of fruits and vegetables, as well as sedentary habits (ECKHARDT *et al.*, 2017). This diverse set of contributing factors for overweight and obesity in adolescence is also explained by the markedly long time spent using mobile phones, electronic games and television, that explain the

sedentary behavior and occasional activity in around 27.7% in this audience (FRIEDRICH *et al.*, 2015; ECKHARDT *et al.*, 2017). Adolescent overweight is becoming a serious public health problem whose prevention and treatment are challenging, because they severely affect health in this life cycle, leading to changes in lipid and carbohydrate metabolism, and considered risk factors associated with diseases such as cardiovascular diseases (CVD), diabetes, hypertension and dyslipidemia (HOLDSWORTH *et al.*, 2016). This situation needs interventions to reduce overweight by decreasing or eliminating habits that contribute to its occurrence. Several educational interventions with different strategies and approaches have been proposed to promote appropriate habits for the prevention and control of overweight in various population groups, especially the adolescent audience (FRIEDRICH *et al.*, 2015). Targeted educational interventions promote learning, improve healthy behavior, and stimulate behavioral changes necessary for better lifestyle

habits. In this sense, it is important to search for educational strategies that are effective in promoting change and weight loss among overweight adolescents (FIGUEIRA *et al.*, 2017). Among these measures are the adequacy of diet, reduction of body weight, and adherence to the practice of physical activities. Although studies show that the adoption of healthy lifestyle habits is the main extrinsic component for controlling overweight, the use of educational interventions focused on adolescents is rare (PEREIRA; PEREIRA; ANGELIS-PEREIRA, 2017). Thus, the aim of this study was to analyze the types and results of educational interventions that have been used for weight loss in overweight or obese adolescents.

## MATERIALS AND METHODS

This is an integrative literature review. To conduct this research, five steps were taken: elaboration of the research question (identification of the problem), search of primary studies in the literature, evaluation of primary studies, data analysis, and presentation of the review (VASCONCELOS *et al.*, 2018). The guiding question for the Integrative review was “What is the evidence available in the literature about educational interventions used for weight loss in overweight and/or obese adolescents?”. The elaboration of the research question was based on the PICO strategy, in which P refers to the study population (adolescents), I to the studied intervention (educational intervention), and O to the outcome of interest (weight loss). It is noteworthy that the element C, of comparison between intervention or group, was not used due to the type of review (GALVÃO; PEREIRA, 2014). To survey the studies, the Medical Literature Analysis and Retrieval System Online (Medline) databases were selected via the National Library of Medicine PubMed portal; Latin American and Caribbean Health Sciences Literature (LILACS) via Virtual Health Library (VHL), and Scientific Electronic Library Online (SciELO). In each database, controlled descriptors were delimited (Medical Subject Headings-MeSH and Descriptors in Health Sciences).

The controlled descriptors were: Food and Nutrition Education, Health Education, Educational Technology, Weight Loss and Adolescents. As for the Medical Subject Headings (MeSH), the following were used: Health Education, Weight Reduction Programs, Educational Technology, Weight Loss and Adolescents using the boolean operators “or” and “and”. The search strategy with controlled descriptors with different crossings was implemented in each database. The search strategy employed in the Medline database was as follows: Health Education OR Weight Reduction Programs OR Educational Technology AND Weight Loss AND Adolescents. In LILACS, they were: Food and nutrition education OR Health education OR Educational technology AND Weight loss AND Adolescents. In SciELO, they were: Health Education OR Weight Reduction Programs OR Educational Technology AND Weight Loss AND Adolescents. The search for primary studies in the selected databases took place in May 2019. The selection criteria were: original full-text studies without delimitation of time of publication, whose study sample consisted of overweight or obese adolescents; articles evaluating weight or body mass index (BMI) before and after an intervention; articles published in Portuguese, English and Spanish. Dissertations, theses, literature reviews, notes and editorials were excluded, as well as duplicate studies.

In the evaluation of primary studies, the nomenclature for the type of study indicated by the authors was maintained. A validated instrument from Silveira (2005) was used for data analysis and extraction. The search in the databases, with the association of descriptors, resulted in 869 articles. The exclusion of duplicate records indicated 867 eligible studies, and after reading the titles and abstracts 49 were selected for full reading and 818 were excluded. After the full reading of the studies, 42 were excluded because they did not meet the inclusion criteria of evaluation of anthropometric data (weight or BMI). Thus, the final sample of the review consisted of 7 articles (Figure 1).

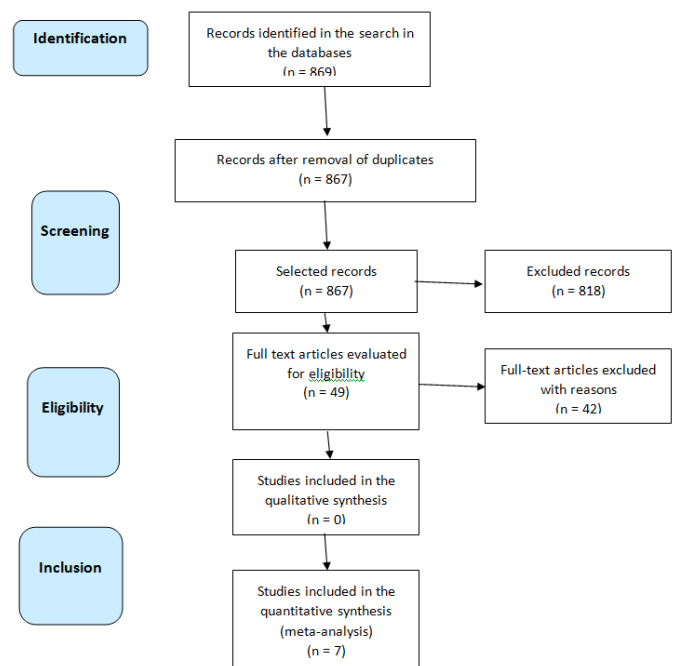


Figure 1. Flowchart adapted from Prisma for selection of studies, Imperatriz - MA, Brazil, 2019

## RESULTS

A total of 5 articles (71.4%) were classified as level IV, and 2 (28.6%) were classified as level II. This review considered a classification system consisting of seven levels of evidence, as follows: level I - evidence from systematic reviews or meta-analysis of relevant clinical trials; level II - evidence derived from at least one well-designed randomized controlled trial; level III - well-designed clinical trials without randomization; level IV - well-designed cohort and case-control studies; level V - systematic reviews of descriptive and qualitative studies; level VI - evidence derived from a single descriptive or qualitative study; and level VII - opinion of authorities or expert committee report (MELNYK *et al.*, 2010). Regarding the language, 6 articles were published in English (86%), and 1 (14%) in Portuguese. As for the year of publication, 2 (28.60%) were published in 2017, 1 (14.28%) in 2016, 1 (14.28%) in 2015, 1 (14.28%) in 2014, 1 (14.28%) in 2013, and 1 (14.28%) in 2012. Regarding the type of educational intervention proposed, nutrition education workshops, lectures on healthy eating and practice of physical activity stood out, present altogether in 4 (57.14%) studies. Schools were the environment of 3 (42.80%) interventions (Table 1). Regarding the condition of adolescents with respect to weight, 4 studies worked with obese adolescents (57.10%) and 3 (42.90%) with overweight and obese adolescents.

**Table 1. Distribution of publications according to level of evidence, author and year, language, type of educational intervention proposed and environment of intervention, Imperatriz-MA, Brazil, 2019**

LE	Author and Year	Language	Type of educational intervention proposed	Environment of the intervention
IV	AL-HAIFI et al., 2012	English	The program included counseling, nutrition education, exercise, and family support sessions.	Indoor and outdoor environment of a college
IV	CARRAWAY et al., 2014	English	Nutrition Education Workshops, Cognitive Behavior Therapy, Group Therapy	Campsite
IV	FILGUEIRAS; SAWAYA, 2018	Portuguese	Nutrition Education Workshops, Physical Education Workshops, Psychology Workshops	Nutrition Recovery and Education Center
IV	LAZORICK et al., 2015	English	Lecture Program on Healthy Eating and Physical Activity	Classroom, School
IV	LAZORICK; FANG; CRAWFORD, 2016	English	Lecture Program on Healthy Eating and Physical Activity	Classroom, School
II	PATSOPOULOU et al., 2017	English	Training Program on Diet and Physical Activity	School
II	RIEDER et al., 2013	English	Motivational interview to support behavior change and encourage physical activity	Community environment

LE: Level of Evidence

**Table 2. Scientific publications by author, public, duration of the intervention, anthropometric indices evaluated, and results in terms of mean reduction in indices, Imperatriz-MA, Brazil, 2019**

Author	Publico f the intervention	Duration of the intervention	Indices evaluated	Reduction in the indices (mean)
AL-HAIFI et al., 2012	Obese adolescents	6 months	Weight and BMI	-10.6 Kg and -4.8 kg /m <sup>2</sup>
CARRAWAY et al., 2014	Obese adolescents	1 month	Weight and BMI	-2.6 Kg and -1.1 kg/m <sup>2</sup>
FILGUEIRAS; SAWAYA, 2018	Obese adolescents	13 months	BMI	-4 kg/m <sup>2</sup>
LAZORICK et al., 2015	Obese or overweight adolescents	3,5 months	BMI	-0.0 km/m <sup>2</sup>
LAZORICK; FANG; CRAWFORD, 2016	Obese or overweight adolescents	48 months	BMI	-1.7 kg/m <sup>2</sup>
PATSOPOULOU et al., 2017	Obese or overweight adolescents	3 months	Weight and BMI	-5.0 kg and -1.8 kg/m <sup>2</sup> -
RIEDER et al., 2013	Obese adolescents	9 months	BMI	-0.63 kg/m <sup>2</sup>

BMI: Body mass index

The average duration of interventions was 11.9 months, with the shortest duration being 1 month and longest 48 months. Regarding anthropometric indices related to body weight, 4 (57.10%) studies evaluated only body mass index (BMI) and 3 (42.90%) evaluated weight and BMI. There was a significant reduction in the indices evaluated in all works except for one of the surveys that evaluated a program of lecture on healthy eating and physical activity. The activities of this program took place within the classroom for a period of 3.5 months; the classes were aimed at overweight and obese adolescents (Table 2).

## DISCUSSION

Educational interventions are increasingly being used as health promotion and prevention tools for various audiences. Such interventions provide greater knowledge about a given subject, stimulate practices and present low cost, being useful in public health policies (VASCONCELOS *et al.*, 2018). However, this review shows that these interventions are not being disseminated and used among adolescents for weight reduction, because a small number of articles that employed educational interventions were found and had results evaluated in parameters related to the body weight of the individuals. This small number of studies on this subject can be explained by the complexity and difficulty of working with adolescents, as adolescence is a phase of many transformations and because of particularities of this audience that pose a challenge in the sense of working with this audience, which may be distancing researchers from this public (SICHERI, SOUZA, 2008). Thus, there is a clear need for more studies on educational strategies to reduce overweight and obesity aimed at adolescents. Another aspects needed is to evaluate anthropometric measures and not only the knowledge arising from the intervention.

The present review highlighted nutrition education workshops and lectures on healthy eating and practice of physical activity as educational interventions as present in most studies. According to Pereira; Pereira and Angelis-Pereira (2017), employing this type of intervention with adolescents is challenging, and when it comes to food and nutrition education, it becomes even more difficult due to the distractions and all the changes taking place in the life of adolescents, which is in line with inferences already cited and shows the importance of these previous studies. Although overweight and obesity is a widely discussed topic, there are still few educational interventions aimed at adolescents address themes such as diet and the encouragement of physical activity. The use of these interventions is important and enables the expansion of knowledge of adolescents in these themes. The use of workshops or lectures as intervention proposals aims at a change in the adolescents' life habits, because in this period of life, the habits and lifestyles are not yet fully defined and are subject to change (SARAIVA; MEDEIROS; ARAUJO, 2018).

The school was the environment of interventions in the majority of studies (42.80%). This is understandable because the school is a space that favors health promotion, especially regarding the formation of knowledge of individuals, stimulation of critical sense and autonomy, exercise of rights and duties, skills, choices for healthier attitudes and control over the own health conditions and quality of life (VASCONCELOS *et al.*, 2018). It is important to highlight that actions carried out in the school environment for promotion of healthy eating and encouragement of physical activity practices should also include parents or guardians, besides ensuring that these activities do remain in the classroom, but rather lead to outdoor activities added to those carried out at school. In this sense, the study by Al-Haifi *et al.* (2012), where the program included family members in the

context of activities and occurred in environments other than indoors, showed better results compared to those proposed to develop activities only in the classroom, showing a reduction of 10.6 Kg on average in body weight and of 4.8 kg/m<sup>2</sup> in BMI. Regarding the weight of adolescents who participated in the various studies, 57.10% of the studies worked with obese adolescents, and the average duration of the interventions was 11.9 months, with the shortest duration being 1 month and the longest 48 months. Regarding anthropometric indices related to body weight, significant reductions were observed in all studies, except for the research by Lazorick *et al.* (2015). Most studies compared obese to overweight adolescents; this probably indicates that there is a search for treatment of obesity, even if discrete, through educational interventions, but prevention and interventions aimed at adolescents at high risk of developing obesity should be priority. Although prevention may seem less challenging than treating obesity, interventions with adolescents who are at a stage other than obesity may yield better results, as only 10% of obese adolescents are interested in treatment (SICHERI; SOUZA, 2008).

All interventions performed in the different studies selected were successful in achieving weight or BMI reduction, except for the intervention of Lazorick *et al.* (2015). The later consisted of a class program on healthy eating and physical activity. The study by Lazorick; Fang; Crawford (2016) with the same approach and which took 48 months for completion, contrasted to the study of Lazorick *et al.* (2015) which took only 3.5 months, achieved a reduction of BMI, showing that the time of intervention directly interferes with the results. The study by Al-Haifi *et al.* (2012) where there were counseling, nutrition education, exercise and family support sessions, and indoor and outdoor college activities, and that of Carraway *et al.* (2014) whose interventions were workshops on nutrition education, cognitive behavioral therapy and group therapy in a campsite, and the study by Patsopoulou *et al.* (2017) using a training program on diet and physical activity at school were the works with the best results in reducing anthropometric indices. These results suggest that interventions using more than one type of intervention, either multidisciplinary interventions, playful activities, and whose environments are attractive such as camping or out-of-room environments, are more likely to have better results when applied. Undoubtedly, the evidences glimpsed in the various studies analyzed showed that the educational interventions used reduced weight and proved to be a viable option to treat and prevent overweight and obesity. Moreover, it is noteworthy that the treatment of this clientele not only generates great costs to public coffers, but also leads to important changes in the health condition of individuals. Thus more strategies are needed for prevention and reduction of overweight, as recent studies have shown that weight loss, even when slight, is associated with a clinically significant improvement in the patient's nutritional and health status (MARKERT *et al.*, 2014).

## Conclusion

It is concluded that the most used educational interventions for weight reduction are workshops on nutrition education and lectures on healthy eating and physical activity. The school was the environment with the largest number of educational interventions aimed at adolescents, and the strategies had positive results in reducing weight or BMI in overweight or obese adolescents.

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