

# Benefits of Hip Hop Dance for obese children and adolescents: A systematic review

## *Benefícios da dança Hip Hop para crianças e adolescentes obesos: uma revisão sistemática*

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### ABSTRACT

The infant juvenile obesity is currently one of the most serious public health problems of the 21st century, being directly related to physical inactivity as a decisive factor in the worldwide epidemic. The programs of conventional workouts have become not so attractive for this particular population. Because of that the access and permanence in those structured physical activity programs for obese adolescents are difficult. This systematic review has the general goal to verify what benefits the systematic practice of hip hop dance, can promote in obese children and adolescents. The search for relevant articles was conducted in the electronic databases Medline (Pubmed), Cochrane, LILACS, SciELO from January through June 2014, being structured as [(hip hop /) and (obesity /) and (children/ adolescent)], controlled and randomized trials were included regarding the systematic practice of hip hop dance as exercise and its benefits for obese children and adolescents, subjects aged 2-19, considered obese and/or overweight. A total of 21 articles were identified in the survey. Based on the found eligible articles for the full review, only one article met all the inclusion criteria. This preliminary study is intended to broaden the context in health for adolescents and children suffering from overweight and/or obesity, recommending an intervention through dance hip hop, it would be an important modality association for possible monitoring and reducing the risk of associated comorbidities. In this field of research, there is a lack of studies of high methodological quality, which may be able to demonstrate the benefits of this type of intervention.

### KEYWORDS

Aerobic exercise; Dance therapy; Capacity aerobic.

### RESUMO

*A obesidade infanto-juvenil é atualmente um dos mais graves problemas de saúde pública do século 21, estando diretamente relacionada à inatividade física como um fator decisivo na epidemia mundial. Os programas de exercícios convencionais tornaram-se não tão atrativos para essa população específica. Por conta disto o acesso e permanência em programas de atividade física estruturados para adolescentes obesos são difíceis. Esta revisão sistemática tem o objetivo geral de verificar quais os benefícios que a prática sistemática de dança hip hop, pode promover em crianças e adolescentes obesos. A busca de artigos científicos foi realizada nas bases Medline eletrônica (Pubmed), Cochrane, LILACS, SciELO, de janeiro a junho de 2014, que está sendo estruturado como [(hip hop /) e (obesidade /) e (crianças / adolescentes)], estudos controlados e randomizados foram incluídos que investigassem a prática sistemática da dança hip hop como exercício e seus benefícios para crianças e adolescentes obesos, indivíduos com idades entre 2-19, considerados obesos e / ou excesso de peso. Um total de 21 artigos foram identificados na pesquisa. Com base nos artigos encontrados elegíveis para a revisão completa, apenas um artigo cumpriu todos os critérios de inclusão. Este estudo preliminar destina-se a ampliar o contexto em saúde para adolescentes e crianças que sofrem de excesso de peso e / ou obesidade, recomendando uma intervenção através da dança hip hop, como uma importante modalidade que pode ser associada no monitoramento e redução do risco de comorbidades associadas. Neste campo de pesquisa, há uma carência de estudos de alta qualidade metodológica, capazes de demonstrar os benefícios deste tipo de intervenção.*

### PALAVRAS-CHAVE

Exercício Aeróbico, Terapia com Dança, Diabetes Mellitus

## INTRODUCTION

The infant juvenile obesity is currently one of the most serious public health problems of the 21st century, which may cause a number of chronic non-communicable diseases (NCDs) in the short and long term<sup>1-4</sup>, increasing public spending in the treatment of diseases associated with obesity.

Brazil is one of the few countries to take initiatives to confront the NCD<sup>5,6</sup>. However, the magnitude of this public health problem is immense and demonstrates the seriousness and concern for the development of complementary and effective strategies. Having strategies in place is possible to improve the quality of life, reduce comorbidities and complications in the short and long term, and modification of lifestyle<sup>5,6</sup>.

The benefits of aerobic exercise in obese children and adolescents have been documented and it has been associated with lower morbidity and mortality<sup>7-10</sup>. In particular, they are known for promoting the weight control, reduction of body fat and maintenance of lean body mass<sup>7</sup>, as well as, the improvement of glycemic profile<sup>8</sup> and lipid<sup>8-10</sup>. They are also known for improving the risk minimization disease like diabetes, hypertension, and cardiovascular disease, and the enhancement of cardiorespiratory fitness<sup>10</sup> and inflammatory profile.

At the same time, it is linked to numerous psychological, physical and social benefits, and improvement of quality of life, which highlights its relevance as a therapeutic intervention in the treatment of infant-juvenile obesity<sup>11</sup>. However, physical exercise programs for this population should not be monotonous, cause boredom, or have unreachable goals. On the contrary, they should be attractive and have surmountable barriers in order to lead to lower dropout rate<sup>7</sup>.

Studies have shown that dance is able to expend similar effort like other aerobic exercise activities<sup>12-15</sup>. Also, it can be characterized as highly effective due to the fact that their results are apparent after shorter practice<sup>12</sup>.

In this context, the hip hop dancing is becoming more popular among teens by promoting greater interest in joining this pace, precisely because it is not monotonous<sup>16</sup> and the fact that teens prefer the dances that are trendy, featuring a product that is in the media<sup>17</sup>.

The dance moves hip hop set are important in this context because they provide capacity and aerobic power of practitioners, aimed at reducing barriers this population in relation to physical activity<sup>18,19</sup> finding more grip, increase in self-efficacy and vigorous physical activity, reducing barriers these young people as to the realization of physical exercise thus acquiring new moves that will provide improved flexibility, strength, endurance and greater adherence in this population physical activity, bringing greater benefits<sup>19</sup>.

In this context, the dance, as an activity that requires similar or greater efforts like those provided by traditional aerobic exercise<sup>12-15</sup>, has been used in obese children and adolescents as a way to promote weight loss. The dance avoids traditional aerobic activities and works as a new and enjoyable program<sup>7</sup>, which is able to promote the reduction of body mass index (BMI), maintenance or weight loss, decreased systolic and diastolic blood pressure, as well as the improvement of aerobic capacity, and life habits<sup>12,20</sup>.

This systematic review has the general goal to verify what benefits the systematic practice of hip hop dance, can promote in obese children and adolescents.

## METHODS

A systematic review was conducted according to the recommendations of the Preferred Reporting Intensity for Systematic Reviews and Meta-Analyses (PRISMA)<sup>21</sup>.

### Inclusion and Exclusion Criteria

This review included controlled and randomized trials regarding the systematic practice of hip hop dance as exercise and its benefits for obese children and adolescents. Inclusion criteria: subjects aged 2-19<sup>22</sup> [OMS], considered obese and/or overweight<sup>23</sup> practitioners of hip hop dance as a form of intervention.

The systematic review included articles written in Portuguese, English, Spanish, and French. All included studies were translated when necessary and possible. It was also an exclusion criterion, inadequate, unclear, or poorly described intervention. Table 1 provides a summary of inclusion and exclusion criteria of this review.

**TABLE 1** – Inclusion and exclusion criteria.

Inclusion Criteria	
Delineation	Controlled and randomized clinical trials
Patients	Obesity and/or overweight Aged 2-19 years
Language	Portuguese, English, Spanish, and French
Exclusion Criteria	
Delineation	Prospective studies and/or cross-sectional designs of prevalence
Study	Unclear studies, poorly described or unclear
Form of Publication	Only abstracts

### Search Strategy

The search for relevant articles was conducted by independent researchers in the electronic databases Medline (Pubmed), Cochrane, LILACS, SciELO from January through June 2014, being structured as PICO, acronym Target Patient, Intervention, Control, and Outcome. The search was performed using descriptors and Boolean operators. The first search was conducted in Pubmed database as follows: [(hip hop /) and (obesity /) and (children/ adolescent)]. The subsequent search bases Cochrane, Lilacs and SciELO had adequacy based on the same, however resembling the first search.

### Selection of Studies

Two independent observers analyzed the results to find potentially eligible studies. The articles were initially selected according to the title; then the abstracts were reviewed and only those which were potentially eligible were selected. Based on the abstracts, full articles were purchased for the finalization of the chosen studies. In case of disagreement between reviewers, a third reviewer made the decision on the eligibility of the study.

## RESULTS

### Results

A total of 21 articles were identified in the survey (Figure 1). They were evaluated in accordance with the revised title and their summaries. Based on the found eligible articles for the full review, only one article met all the inclusion criteria.

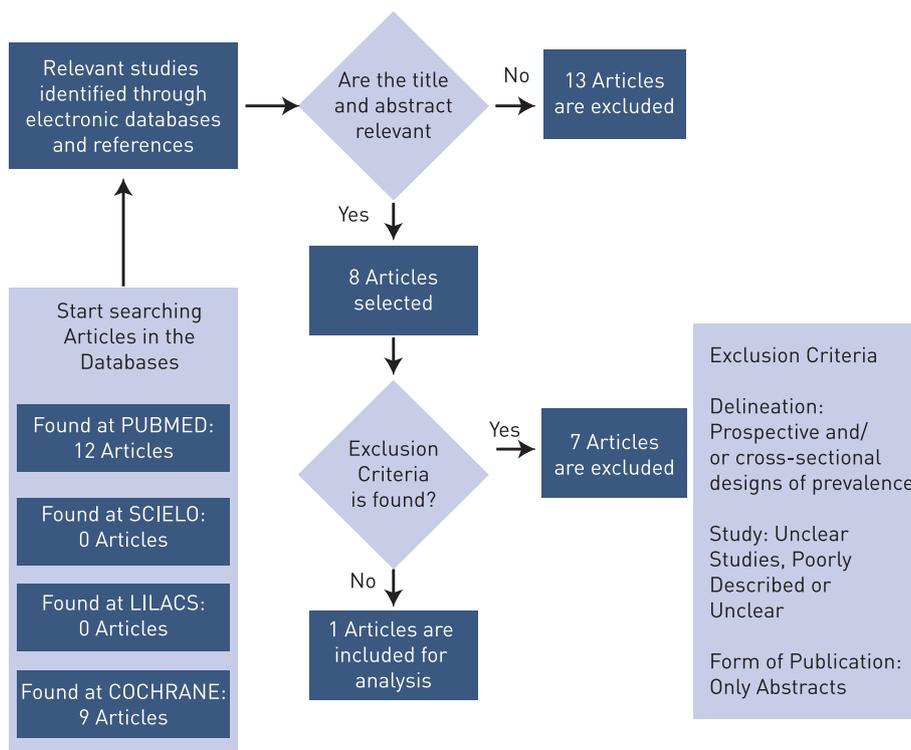


FIGURE 1 – Flowchart of the Search Process.

## DISCUSSION

### Obesity versus aerobic exercise in the treatment of child and adolescent obesity

Obesity is defined as body fat accumulation of abnormal or excessive manner, representing health risk. In this context, overweight and obesity has been regarded as a serious public health problem and therefore is a matter of global impact. Because of that, there is a need for research and development in various amplitudes of obesity<sup>1</sup>.

The concern with this condition is becoming increasingly evident as obesity has spread over the years. It is a problem that was affecting only high-income countries, and today is on the rise in countries with low and middle income, especially in urban environments. The worldwide prevalence of obesity has nearly doubled between 1980 and 2008 and today it is estimated that worldwide occur at least 2.8 million deaths each year by overweight<sup>1-4</sup>.

This pathological process may bring, as short-term consequences, social isolation, low self-esteem, depression, negative body image, hypertension,

hypercholesterolemia, cardiovascular dysfunction, insulin resistance, asthma, and type 1 diabetes mellitus. The long-term consequences include the persistence of obesity into adulthood with associated comorbidities including premature cardiovascular disease, type 2 diabetes, and death<sup>24</sup>. Some other conditions may be attached, in a more severe form, such as pseudo tumor cerebri, epiphysiolysis femoral, and joint diseases<sup>25</sup>.

In this context, physical inactivity has been directly related to the current global epidemic of overweight and obesity as a decisive factor in all age groups. The World Health Organization (WHO) also showed that about 80% of deaths from NCDs occur in low- or middle-income countries, with 29% of deaths in adults under 60 years of age, and in high-income countries it was observed a percentage of only 13% of deaths. The socio economic impact of NCDs is threatening the progress of the Millennium Development Goals, including poverty reduction, equity, economic stability, and human security. Thus, this impact may act as a brake on economic development of nations<sup>26</sup>.

The implications associated with overweight are the following: increased risk of cardiovascular disease, hypertension, diabetes mellitus type 2, and, as noted recently, hepatic steatosis and psychosocial disorders resulting from social stigmatization. Overweight children are more likely to become obese in adulthood, it is essential that public policies are developed in order to prevent obesity and reduce rates of obesity in the pediatric population<sup>27</sup>.

Studies have shown that an energy expenditure of approximately 1000 kilocalories per week with moderate intensity (e.g.; 3.0 to 5.9 Metabolic Equivalents of Task in people between 68 kg and 91 kg) or 150 minutes per week is associated with lower rates of cardiovascular disease and premature mortality. In general, the American College of Sports Medicine (ACSM) recommends that physical activity is necessary with an energy expenditure of 1,000 kilocalories per week, varying between moderate and high intensity<sup>28</sup>.

For weight loss in the long term, the minimum recommended physical activity would be 200 to 300 minutes per week. For the prevention of weight gain, evidence suggests 150 to 250 minutes of physical activity per week. Greater amounts of physical activity (greater than 250 minutes per week) have been associated with clinically significant weight loss<sup>29</sup>.

The adaptations of the body in face of the regular exercise are the result of a set of neural, endocrine, and cardiorespiratory modulations. These modulations occur due to vagal withdrawal and increased sympathetic activity in mechanical and metabolic receptors. This cardiorespiratory and neuroendocrine information add settings that control the mobilization of substrates during acute or chronic exercise. Thus, there is an increase in the number of circulating catecholamines and growth hormone (GH), these enhance the liver and muscle glycogenolysis, lipolysis, and raise greater glucagon release<sup>30</sup>.

Exercise promotes an increase in the concentration of muscle oxidative enzymes optimizing aerobic processes. It also promotes effort tolerance and lipid and carbohydrate metabolism by increasing insulin action and minimizing the resistance to it. Other highlighted adaptations are the increase in muscle blood flow, the number of insulin receptors, and increase in translocation of glucose transporters (GLUT-4) to the cell membrane. It is worth noting, its anti-inflammatory nature. It was observed that regular exercise reduces secretion of proinflammatory cytokines such as tumor necrosis factor-alpha,

interleukins 1.6 and 10, the creactive protein, and others. These adjustments act as a means of primary prevention of cardiovascular disease in the infant juvenile obesity<sup>30</sup>.

In obesity children and adolescents, the physiological adaptations in face of the aerobic exercise have been reported in a similar way to the ones observed in adults. In a particular study performed on obese adolescents<sup>10</sup> the main goal was to compare the efficacy of aerobic and anaerobic exercise associated with nutritional guidelines on body composition, biochemical measures, and physical ability. For that, obese adolescents were submitted to a physical training program, three times a week during 16 weeks for 20 to 40 minutes. As a result it was observed that, in both methods of training (aerobic and anaerobic) was decreased serum cholesterol and LDL, significant increase in VO<sub>2</sub>max in both groups, and reduction of the total body mass associated with improvement in body composition. Both forms of exercise showed satisfactory results, although the group that performed aerobic exercise achieved major response.

In another study it was carried out a program of aerobic and anaerobic exercises with obese adolescents for the period of twelve weeks<sup>7</sup>. The authors observed decreases in variables such as: body mass, BMI, the mass of total body fat and lower limbs, and body fat percentage trunk during exercise in both groups. They observed that anaerobic exercise was skilful in generating the reduction of body fat and fat levels, while aerobic exercise was effective to maintain and/or addition lean mass and fat-free mass. The authors noted that regardless of the exercise used, the intensity should always be progressive, which is the primary factor in getting results, when considering conditioning and loss of body mass. The authors also point out that low adherence which was proven by training with young people can be mustered to the type of activity proposed.

Randomized study of obese adolescents at risk for type 2 diabetes using a program of intensive life style<sup>8</sup> suggested that the intervention could improve or even normalize glucose tolerance in obese adolescents with pre-diabetes (period preceding diabetes when the insulin level is between 100 and 125 mg/dl). The program also received favorable results over other factors of cardio-metabolic risk because there was decrease in percentage body fat and fat mass, systolic blood pressure, and fasting triglycerides.

The diet and physical activity are the mediators of body weight and both behaviors can be modified through weight control where adult or child regulate their eating and physical activity programs<sup>23</sup>. Behavioral skills are taught to implement or maintain weight changes in order to prevent complications and improve quality of life. In this context, regular physical exercise has been recommended for the prevention and treatment of cardiovascular disease, including its risk factors, and other chronic diseases in obese children and adolescents.

### Dance as a physical exercise

Man has been using dance, since inception, as a form of expression, pleasing, charming, communication, and pleasure<sup>31</sup>. However, over the years, we have been highlighted the importance of dance as a form of therapy, aiding in good mental, emotional, and physical being<sup>15,32</sup>. With the advantage of being accessible to all ages, developing and improving various aspects<sup>31,33</sup>, the dance has

been used in numerous pathologies, as a form of alternative treatment<sup>34,35</sup>.

The dance, over the years, has been attracting more and more followers, and among these are children and adolescents seeking the use of dance as a way of diverting the daily activities and requirements imposed by the school<sup>16,17</sup>. During this process they find a form of leisure, spend their free time with an activity, and use the dance as a form of socialization which is very important<sup>16,17</sup>.

Studies have shown that dance is able to expend similar effort like other aerobic exercise activities<sup>12-15</sup>. Also, it can be characterized as highly effective due to the fact that their results are apparent after shorter practice<sup>12</sup>. The act of dancing combines broad movements of the whole body, social interaction, and fun, favoring the choice of this type of training<sup>35-37</sup>.

In the cardiovascular system this activity is able to promote the improvement of physical fitness in general, stimulate greater energy expenditure, and, as a result, decrease in blood pressure<sup>15,33</sup>. In dance, the intensity of aerobic exercise is controlled by the musical progress, and it determines the speed of the movements, similar to a metronome<sup>38</sup>. Speed and musical rhythms are able to trigger changes in heart rate (HR), thereby increasing cardiac output and energy expenditure<sup>12,39</sup>.

In children and adolescents<sup>20</sup> the dance has been used as a way to promote weight loss, to avoid traditional aerobic activities, functioning as a new and enjoyable program that results in reduction of BMI, maintenance or weight loss, decreased systolic and diastolic blood pressure, improvement aerobic capacity, and lifestyle<sup>12</sup>.

Not just the act of dancing, but also other forms of aerobic exercise cause welfare and reduce anxiety. However, the psychological benefits, as a result of systematic practice of dance as a form of aerobic exercise are also described as noticeable improvement in body awareness and self-confidence, as well as the ease of sharing feelings in practitioners<sup>15</sup>.

### Hip Hop as a form of exercise for obese children and adolescents

Hip hop is an artistic culture that began in the 1970s in the central areas of Jamaican communities, Latin and African American in New York City, having as its creator Africa Bambaata. Hip hop incorporates many artistic forms such as Rap, DJing, Breakdance, and the Graffiti writing. In its origin, hip hop concentrated in DiscJockeys who created rhythmic beats, characterized by small snippets of songs that emphasize repetition. It was later accompanied by Rap and identified as a musical style of rhythm and poetry. Also, emerging improvised dances such as breakdance, popping, and locking gave rise to hip hop dance<sup>40</sup>. The hip hop dance moves are characterized by providing capacity and aerobic power of practitioners<sup>18</sup>.

Thus, the hip hop emerged with the aim of promoting energy expenditure in order to prevent young people practicing illegal and harmful actions. In this way, the hip hop is more than music and dancing much to jump and sway - the literal meaning of the English translation of the term. The same seeks to educate, humanise, promote, and entertain, and besides claim rights and respect<sup>41</sup>.

Childhood and adolescence are characterized by a phase in which there is unity in groups of the same age, same sex or opposite sex, and of the society

as a whole. Learn how to dance is one of the ways that adolescents can be accepted in a particular social group<sup>17,31</sup>.

So hip hop is a widespread pace in this particular medium and attract the young people just because it is popular. Hip hop is also presented through video clips with images of famous American actors, drawing attention and causing these adolescents to have more interest in joining such a pace<sup>16</sup>.

In this systematic review we found only one article<sup>18</sup> that evaluated the benefits of dance hip hop in obese adolescents. In this pilot study, hip hop dance was used as a program of physical activity after school hours, with a sample of 73 obese adolescents Mexicans and Americans, with 40 girls and 32 boys, aged between 11 and 16 years old, with the objective to reduce barriers to the practice of physical activity. As the proposed protocol were 10 sessions for 5 weeks, with a frequency of 2 times per week, for about 50 minutes<sup>18</sup>. After the intervention period adherence was found around 77% of young people recruited as well as it was found significant increases in self-efficacy, and vigorous physical activity<sup>18</sup>.

According Romero<sup>18</sup>, interventions using hip hop dance after school for adolescents from low-income and residents of neighborhoods areas where there seems to be no places for physical activity, has proved successful in order to reduce sedentary and increase the level of physical activity, especially in girls.

A current study provided preliminary evidence that the hip hop dance as a form of intervention proved to be an effective strategy for increasing physical activity among obese adolescents, as well as high level of participation. However, the results are limited, given the small sample size, suggesting future studies with more rigorous criteria, such as controlled clinical trial and control group<sup>18</sup>.

It is believed that not only hip hop, but also their variations, may be able to influence the daily life of adolescents, making them more confident and strong when facing problems of contemporary life<sup>41</sup>. The hip hop increases the human knowledge of himself through choreography adapted to various rhythmic movements and sound, thus contributing to the development of the child. Providing expression, creation, motivation, escape from problems with improvement in quality of life<sup>42</sup>.

## CONCLUSIONS

This preliminary study is intended to broaden the context in health for adolescents and children suffering from overweight and/or obesity, recommending an intervention through dance hip hop, it would be an important modality association for possible monitoring and reducing the risk of associated comorbidities.

In this context, the hip hop proved promising modality as a form of physical training for obese children and adolescents with high adherence, however, there is a lack of studies of high methodological quality, which may be able to demonstrate the benefits of this type of intervention.

## Conflicts of Interest

The authors declare no conflict of interest.

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## Author's contributions

All authors participated directly in the structuring, development and revision of the manuscript.

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