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Review Article

Aerobic exercise on body composition in overweight and obese adults - A systematic review without meta-analysis.

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Abstract

Introduction and Aim: This study was aimed to review effectiveness of Aerobic Exercise on body composition in overweight and obese adults.
Materials and Methods: The database used for searching articles were PubMed, Science direct, Physiotherapy Evidence Database (PEDro), Medline. We collected 310 articles from the past 20 years. Selection criteria: A Selection criterion includes studies which included overweight and obese adults, patients of age more than 18 years, and articles using aerobic exercise. Inclusion and exclusion criteria**:** Studies such as Clinical trials, randomized-controlled trials have been included, excluding reviews, case reports, and Meta-analysis articles. Only the population of overweight and obese adults has been included.
Result: The study emphasizes the effect of aerobic exercise on overweight and obese adults. These studies investigated the prevalence of reduced BMI and visceral fat of overweight and obese adults.
Conclusion: Aerobic exercise can be recommended to reduce BMI and visceral fat in overweight and obese adults.
Keywords: Obesity, Aerobic Exercise, and Body Mass Index.

Introduction

Overweight and obese are described as abnormal or excessive fat accumulation that can also impair health. Obesity is associated with a large number of debilitating and life-threatening disorders, such as cardiovascular, metabolic and other non-communicable diseases.[1] However, it involves the integration of social, behavioral, cultural, physiological, metabolic, and genetic factors.[2] As especially for college students, some of them failed to find a satisfied job or healthy lifestyle due to obesity.[3] In India, there is a nutritional transition from typical carbohydrate diet to fast food dietary habits; particularly young adults like medical students have been affected.[4] According to 2016 report of World Health Organization, more than 1.9 billion adults (18 years and older) were overweight. Of these over 650 million were obese. Overall, in 2016 about 13% of the world's adult population (11% of men and 15% of women) were obese and 39% of adults aged 18 years and over (39% of men and 40% of women) were overweight. The worldwide prevalence of obesity more than tripled between 1975 and 2016.[4]

Extensive literature reviews suggest that the traditional aerobic exercises for the abdomen are effective in reducing the abdominal girth and fat. The purpose of this systematic review was to evaluate the effectiveness of the aerobic exercise for overweight and obese adults.

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Material and methods

Selection of Studies

The databases used for searching articles were Cochrane Library Trials, PubMed Central, PEDro, Rehab data, Research Gate, and SAGE Journals. Results yielded from PubMed (172), PEDro (46), Science Direct (65), Medline (27). Totally 310 articles, Ended up with keywords. The overweight and obese adult for aerobic exercise. All articles are scrolled between the years 1999 to 2019.

Inclusion and Exclusion Criteria

Studies such as Clinical trials, randomized-controlled trials have been included, excluding reviews, case reports, and Meta-analysis articles. Only the population of overweight and obese adult has been included**.**

Types of Intervention: Studies that involved aerobic exercise were included.

Statistical Method

Assessment of study characteristics and risk of bias: Papers were critically analyzed for their methodological quality. Of which there were several similarities between the studies but only those relating to the title, aim, and eligibility criteria were considered. To identify eligible studies from the remaining article, the full text of each article was reviewed. Reference lists from identified studies and reviews were manually scanned to identify any other relevant studies. Descriptive analysis was used to compare the study characteristics: study design, demographic data, number of participants, type of intervention, and outcome measurement.

Result

The initial search yielded 310 documents; of these, 31 were selected. After reading each article in full, 28 were excluded for not meeting the eligibility criteria, leaving a total of 3 articles analyzed and submitted to the data collection phase of this review (Figure 1). Sample sizes ranged from 20 to 175 subjects of both sexes. The studies included adult and overweight and obese adults of various age groups, and the mean participant age was above 18 years. One study applied treatment for overweight and obese adults patients along with aerobic exercise used to treat a patient's level of pain as well as the change in patient status. The studies used aerobic exercise. Descriptions of the subjects, results, and criteria are located in Table-1.

Figure 1: Flowchart of the article inclusion process in the systematic review.

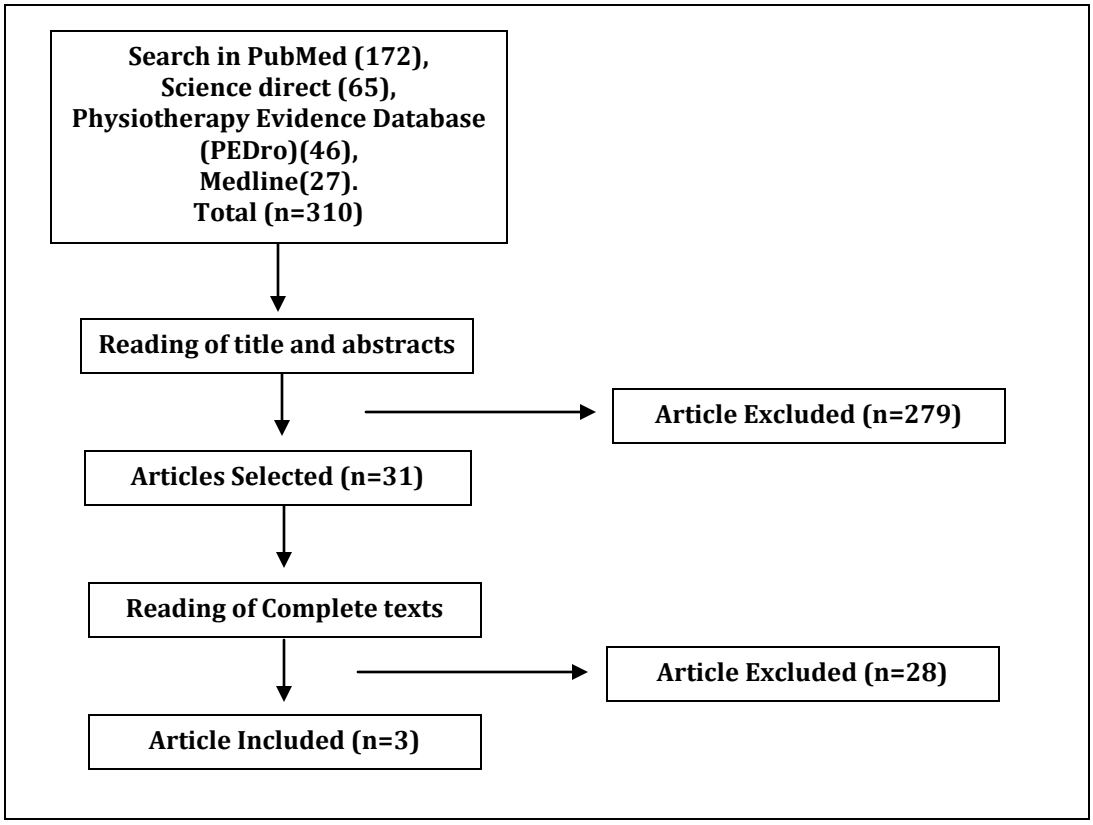

Table 1: Included studies

Author	Gender, Age and Sample Population	Treatments	Measurement	Outcome Score
Chih-Hui chiu, et al. (2017)	Age 18-26 years both gender, randomized sample, Intervention 12 weeks, population is 53	Three variations of aerobic exercise Consider with intensity groups are High intensity training group (HITG), Middle intensity training group (MITG), Low intensity training group (LITG).	BMI: Body Mass Index WC: Waist Circumference in cm	BMI: HITG-27.08(±0.39) MITG - 30.08(±0.91) LITG-29.67 (±0.94) WC: HITG- 88.04(±1.88) MITG - 95.92 (±2.18) LITG - 94.12(±2.36)
Gorostegi Anduaga I., et al. (2018)	Age<40 years both gender, randomized sample, Intervention 16 weeks, population is 175	Three variations of aerobic exercise Consider with intensity groups are high– volume and moderate-intensity continuous training (HV-MICT), high volume and high-intensity training (HV-HIIT), Low-volume and high intensity training (LV-HIIT).	BMI: Body Mass Index WC: Waist Circumference in cm	BMI: HV-MICT-29.7(±4.1) HV-HIIT - 28.2(±3.4) LV-HIIT- 29.4(±4.1) WC: HV-MICT– 97.6(±10.5) HV-HIIT - 93.8(±11.4) LV– HIIT - 96.2(±8.7)
Sanal E., et al. (2013)	Age<35 years, Male gender, randomized sample, Intervention 12 weeks, population is 20	Two groups are aerobic exercise (AE) or combined aerobic resistance exercise (ARE)	BMI: Body Mass Index WC: Waist Circumference in cm	BMI: AE- 29.9 (±4) ARE - 30.5(±3.7) WC: AE - 92.1 (±8.9) ARE-92.9(±9.8)

Discussion

This systematic review could not provide a sufficient level of evidence, to highly recommend the intervention to overcome the outcome following Obesity, as only a small number of studies were available based on search criteria. Still, the review provides some sort of evidence that aerobic exercise would be beneficial in regaining outcomes in Obesity, based on the RCT studies evaluated. During detailed study selection, some articles were excluded, as few studies were not focused on a specific outcome. Illustrates the benefits of each type of aerobic exercise and its effects on reducing BMI and Waist Circumference. Outcome measures varied for each study, the outcome measures of each report from which data has been extracted.

In the study of, Chih-Hui Chiu, et al. was shown to outcomes reduce BMI and Waist Circumference.[5] In the study of, Gorostegi Anduaga I., et al. study was showed to reduce BMI and Waist Circumference.[6] In the study of, Sanal E., et al. was showed to reduce BMI and Waist Circumference.[7] Aerobic exercises are having been varied between studies. Also, studies failed to include the long-term follow up, to assess any change in outcome. Due to a large number of limitations and fewer no relevant articles, a strong conclusion was not possible. Future studies should be taken to address these limitations and can also concentrate on overweight and obese adults. The study was done a short period with a minimal database search engine. Few articles had a suboptimal sample size in their study. Additionally, it must be noted that the review considered articles that were written in English only.

Conclusion

The aerobic exercises showed significant changes in the studies taken into account. Although a smaller number of studies cannot confirm the efficacy of aerobic exercise in reducing obesity. As the aim of this systematic review was to synthesize information on the effects of aerobic exercise and also only a few articles were available to be said as valid sources of information in exploring different interpretations and perspectives. Based on this review aerobic exercise can be recommended to reduce BMI and visceral fat in overweight and obese adults. Still, further study is expected in this area.

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