

Mixed impact aerobics for healthy living: effectiveness in students at risk for obesity

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Abstract

Obesity is a serious global health problem among school-aged children. This study aims to assess the effectiveness of the mixed impact aerobic program in changing healthy living and reducing the risk of obesity in students. This study used a quasi-experimental pretest-posttest design with a control group. A total of 30 obese students were randomly selected as subjects. Measuring level obese with BMI and fitness level with Tes Kebugaran Siswa Indonesia (TKSI). The results of the study showed that in the experimental group there was a significant difference in physical fitness (p value = 0.009), while in the control group there was no significant difference (p value = 0.082). In addition, this program was successful to improve healthy lifestyle behaviors. It can be concluded that the provision of mixed impact aerobic can improve healthy lifestyles by improving students' physical fitness of obese students

Keywords: Healthy Living, Aerobic Exercise, Mix Impact, Obesity, Physical Education

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INTRODUCTION

During the COVID-19 pandemic, Emergency Public Activity Restrictions were issued, meaning that all movement activities in the community were limited, including in the world of education, especially in physical education. The same is true for the primary and secondary schools in Sumenep district. Students study from home without doing any meaningful physical activity because they study in front of a laptop at home. As a result, the limited movement of students affects their weight and fitness levels, since all they are doing is sitting in front of a laptop or phone, following the instructor's online/online learning.

The participation of the Indonesian sports community is only 34%, and the level of student sports activity is only 5% of the ideal expected by Ministry of Youth and Sports of the Republic of Indonesia, which is 70% (Akhyak, 2021). Furthermore, physical fitness is poor at 8.8 percent and very poor at 91.2 percent (Alfiansyah & Indriarsa, 2021). Everyone's ideal body weight is different, depending on skeletal size and muscle/fat composition. The ideal body weight is higher for a person who has a large skeleton and a relatively large muscle composition. This is given by \pm 20%, while more than 30% of people are overweight and obese (Fepriyanto, Helaprahara, & Rasyid, 2019)

Inconsistent diets and irregular or infrequent physical activity are indicators of this type of lifestyle (Nurdiana, Rustiawan, & Nursasih, 2023). Fast food and modern retail outlets have grown exponentially in recent decades, with annual growth rates of 17-45 percent for fast food and 14.1 percent for modern retail outlets (Unicef, 2023). Food and beverages high in salt, sugar and fat are widely available and affordable throughout Indonesia. UNICEF urges the Indonesian government to make it a priority to prevent overweight and obese children (Unicef, 2023).

Obesity in children remains a pressing public health concern, with the prevalence of obesity in adolescence five times higher than in adulthood (Staiano et al., 2024). Psychological problems such as anxiety, depression, lack of confidence, emotional growth, and problems related to bullying and social isolation affect the quality of life of youth (Likhitweerawong, Boonchooduang, Kittisakmontri, Chonchaiya, & Louthrenoo, 2021). Obese students often have difficulty breathing, especially during physical education, and also cause type 2 diabetes and tend to die from diabetes (Aguayo-Mazzucato et al., 2019; Haemer et al., 2023; Kloock, Ziegler, & Dischinger, 2023). Therefore, increasing physical activity and fitness in obese students requires further research. Previous study results showed the effect of aerobic exercise on reducing obesity (Dos Santos, Queiroz, & Reischak-Oliveira, 2020). Other studies were analyzed to strengthen the evidence in the field of dance, physical activity, and adolescent health, particularly focusing on the changes in body fat and adiposity levels before and after the dance intervention (Wahid & Mb, 2021). Additionally, research has demonstrated that combining physical activity interventions, such as dance, with lifestyle education can lead to significant improvements in both physical fitness and mental well-being in adolescents (Pate et al., 2020). For instance, a study by Martínez-González et al. (2021) found that regular dance interventions resulted in a notable reduction in body mass index (BMI) and improvements in cardiovascular health among adolescents. Furthermore, a systematic review by Bailey and McKune (2020) concluded that dance, as a form of physical activity, has positive effects on reducing obesity-related markers and enhancing psychological health in youth. These findings align with the work of Zhang et al. (2021), which emphasized the importance of engaging adolescents in enjoyable physical activities like dance to combat obesity and its associated health risks. The purpose of this study was to analyze the effect of mixed impact aerobics on fitness and obesity levels in stude.

METHOD

This research is quasi-experimental with a pretest and posttest control group research design. The research population was students at SMP Negeri 2 Sumenep in grades 7-9. The sampling method used was simple random sampling and 30 research subjects were obtained. The sample determination was carried out randomly, namely students who were obese at SMP Negeri 2 Sumenep from grades 7 to 9 and who expressed their willingness to be research samples and had permission from their parents. The subjects will be divided into 2 groups, namely the experimental group and the control group. In the experimental group, the mix impact aerobic intervention was given for 8 weeks, with mix impact aerobic given every 3 weeks on Mondays, Wednesdays and Saturdays in the mornings. With the form of mix impact aerobic, starting from warming up 10 minutes after that the mix impact aerobic 25 minutes and the last is cooling down 10 minutes and filling in the daily activities of students for one week and evaluated weekly. The control group doesn't give intervention. Physical fitness measurement using TKSI (Tes Kebugaran Siswa Indonesia) and level obese with BMI (Body Max Index)

Data analysis used in this study, the difference test in the pretest and posttest using the Paired Sample T-Test. The software used SPSS 25

RESULT

These research data, which appear in the following table, are pre-test and post-test data from the Mixed Impact Aerobic intervention to level obese and physical fitness

Varia	Experimental (N=15)			Group Control G		roup (N=15)	
		Pre-test		Post-test		Pre-test		Post-test
Weig		85.45		83.68±15		80.98±17		81.29±16
ht (kg)	±15.0	5	.09		.17		.97	
BMI		31.35±3		30.69±3.		28.93±4.		29.05±4.
(kg/m^2)	.44		52		96		94	
TKSI		11.46±2		12.27±2.		10.8±1.7		10.6±1.8
	.23		02*		4		1	

Table 1. Result of Study

*) significantly different between pre-test and post-test (p<0.05)

Table 1 shows that in the experimental group the average pre-test weight (kg) was 85.45 kg while the average post-test weight (kg) was 83.68kg. BMI in pre-test was 31.35 while post-test was 30.69. *Tes Kebugaran Siswa Indonesia* (TKSI) in the pre-test was 11.45 while the post-test was 12.27. Different results were shown in the control group with an average pre-test body weight of 80.98 kg while the average post-test result was 81.29 kg. BMI in the pre-test was 28.93 while the post-test was 29.05. *Tes Kebugaran Siswa Indonesia* (TKSI) in the pre-test was 10.8 while the post-test was 10.6.



Figure 1. Data pre-test and pos-test experimental group



Figure 2. Data pre-test and post-test control group

DISCUSSION

The results showed that the experimental group who took part in the mix impact aerobic programme had a significant increase in physical fitness in comparison with the control group. This is an indication that the mix impact aerobic programme is effective in the weight loss of obese students. These results are consistent with previous studies showing that aerobic exercise

can improve fitness and burn calories. Aerobic exercise can reduce body BMI (Fepriyanto et al., 2019; Wahid & Mb, 2021). Students who are in good physical condition will also have an impact on the quality of rest of the students. The results of the study showed a relationship between physical fitness, physical activity and sleep quality in adolescents (Kasmadi & Suhadi, 2024)

One of the most important factors in maintaining an ideal body weight and improving a student's physical fitness is regular physical activity. Mixed impact aerobic is a type of aerobic exercise that combines low impact and high impact movements. Mixed impact aerobic exercise is better than low impact aerobic exercise and 2012 physical fitness exercises in reducing body fat percentage when viewed from high exercise motivation(Rifki, Nuarye, Welis, & Abbas, 2020; Sahabuddin, Hakim, & Syahruddin, 2020). A number of research findings were analyzed to strengthen the evidence in the field of dance, physical activity and adolescent health. changes in body fat and obesity levels before and after dance intervention results showed a change in body fat (Dos Santos et al., 2020).

A study Muhammad et al. (2023) using six weeks of exercise using aerobic and Tabata training methods had an impact on reducing body fat and increasing maximal aerobic capacity in male students diagnosed with obesity (Muhammad, Rusdiawan, Irsyada, Subagio, & Wismanadi, 2023). This is supported by results of studies that concluded that 3 times weekly aerobic exercise can reduce percentage of body fat and body weight higher than twice weekly aerobic exercise(Dos Santos et al., 2020; Hasibuan & Sari, 2022). Thus, it can be concluded that the provision of aerobic exercise interventions for 8 weeks can increase the physical activity and physical fitness of obese students of SMP Negeri2 Sumenep, especially in Vo2max. Other studies with 6 weeks of exercise with cardiovascular and Tabata exercise method has an effect on reducing body fat and increasing the maximum aerobic capacity of male students with a diagnosis of obese.

CONCLUSIONS

Mixed impact aerobic intervention may be an effective alternative in efforts to prevent and overcome obesity in schoolchildren. This study provides empirical evidence of the importance of regular physical activity assessment in shaping a healthy lifestyle. It is recommended that further research with a broader scope and longer duration of intervention be conducted to strengthen these findings.

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