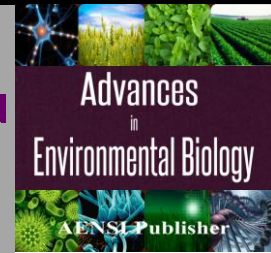




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### Effect of Skipping Rope on Body Compositions and Heart Beat of Inactive College Students

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#### ABSTRACT

Background and aim: Various physical activities can perform important and valuable role in health recovery and enhancement of individuals' preparation level. The purpose of present research is to examine the effect of skipping rope on body compositions and heart beat of inactive college students. Materials and methods: This clinical examination was done on two groups of 15 persons that were chosen from inactive college students of Yazd province Peyamenour University with age range of 20-30 years old. They were divided to two equal experimental and control groups. For experimental group in every sessions of skipping rope exercises had been planned, warming up for 3 minutes, skipping rope activity for 17minutes with 3 rests for 1 minute. The exercises were considered in 24 sessions for 20 minutes. However, the control group didn't perform special exercise. In both groups, weight, fat percentage, fatless mass and heart beat were measured during rest situation before and after beginning of skipping rope exercises. Result: Results showed that skipping rope in experimental group comparing to control group after 8 weeks led to decrease in fat percentage, weight, fat mass and heart beat in rest situation, but any significant change was not seen in fatless mass. Conclusion: so the considered skipping rope programs that need space, time and cost a few, it can reduce weight and increases the heart efficiency partially.

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### INTRODUCTION

Industrial progression and machine life have minimized physical activity during recent several years that led to numerous difficulties too. One of the problems is excess weight and reduction of heart –vascular and aspiration efficiency, that nowadays many people and particularly children and teenagers are affected by it. Obesity problems particularly in teenagers is critical and during previous decades, this crisis has attracted the researchers' consideration because of fatness intermixing with physical patients and on the other hand, researches on improper effects of excess weight and hypodermic fat mass around the organs have caused that the people do physical exercises and some researches were done on the physical composition and reduction of heart beat in rest situation in field of effects of physical activities that their results can be interested.

After a physical exercise program such as slow running, walking and average running, women can state the following changes: 1- Remarkable reduction of body fat( for example 2.5 to 3kg) -2 Few increase in fatless weight. 3- Few reduction in weight (3kg) [1].

Ride and Shephards study in 1993 and Nouri Habashi in 2010 revealed that, active persons are better than their inactive peers from concerning of hypodermic fat [2,3]. Hamediyani in 2010 indicated that a chosen physical preparation on the aerobic power and 30-40 aged men's body compositions led to reduce the body fat percentage and had positive effect on physical composition and increased aspiration system efficiency of the sample persons [4]. Shari and et. all in 2008 with study on 25-35 aged men, concluded that regular physical activities cause to reduction of body compositions (fat percentage, weight and fat weight) of persons [5].

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Masoumi in 2010 concluded in this study that the chosen exercise program (mixed exercise such as slow continuous running, continuous running and resistance exercises with tolerate of body weight for 12 weeks and each 4 weeks 90 minutes) has significant effect on the physiological capacities (reduction of heart beat in rest and exercise situation) and body compositions (reduction of body fat and fat weight) but it hasn't any significant effect on fatless weight [6].

Skinner in 2005 investigated volunteer men who average age was 20-30 years old. The applied exercises in this research included exercise for 30 minutes in each session for 20 weeks. 4 participated groups in this research, exercised for 1, 3 and 5 days in a week respectively and the forth group was not active. The measured factors were beating of heart in rest time, blood pressure, time of activity on the roller strip, maximum consumed oxygen, pulmonary volume and fat percentage. The results of research was revealed that there was significant difference between blood pressure, beating of heart in rest time and recovery, maximum beating of heart (rest and recovery, time of exercise on the roller stripe) and the exercise sessions. Moreover, hypodermic fat was decreased with 5 days exercises in a week. General result of this research indicates that the exercise sessions are effective on the cardiac-vascular factors and body fat [7].

Zafeiridis and *et al* have studied the fat people and obtained this result that anaerobic exercises have not significant effect on proper changes of body compositions [8]. But in the other hand, remarkable researches have been done about positive effect of aerobic exercises on body composition, weight control and heart beat in rest time [9, 10, 11]. But few researches were done about effect of aerobic skipping the rope exercises on the changes of body compositions and heart beat in rest time, that it indicates the need of more study in this field, particularly for students. The present research has been done in order to examine the effect of skipping rope on body composition and heart beat in rest time of inactive boy students.

#### *Method of research:*

This is semi experimental method and experimental and control group were participated in it. Method of work was as the following:

30 college student of yazd payamenur university were selected in 2 group of experimental and control group with average age of 20-30 that they had higher than 30% fat. Both group were pre examined in order to measure first heart beat in perfectly rest time (at 8 (AM) o'clock and after 15 minutes resting in sitting situation) and then experimental group to measure body compositions performed skipping rope exercises which was included warm up for 3 minutes, skipping rope for 17 minutes with 3 times rest that take time 1 minute and activity intensity was 30 cycles in first week, 40 cycles in second week, 50 in third and 60 cycles in fourth. The exercises were performed for 8 weeks and 3 sessions (20 minutes) in each week but the control group did not perform any special exercise. They continued their exercises according to the previous procedure and both group did the past test again, at the end of exercise.

This research has been done in standard and equal condition, after satisfaction of college students, university authorities, then location and measurement time of operations section variables and experimental skipping rope activity were performed similarly. Body composites were measured in pretest and past test by Auto analyzer device (body composites) in sport saloon of Taft Peyamenour University.

After determination of fat percentage, in number was multiplied in body weight, the fat weight was obtained and reducing this number of total body weight, the fatless weight is calculated [12]. Digital cardiogram system (MBO, Digimad 16 made in England) was used in order to determine heart beat in rest situation.

#### *Statistical method:*

Finally, t-test of independent groups was used to examination of deference between experimental and witness groups ( $p \leq 0.05$ ). Moreover, the obtained results from final test of experimental group was compared to pretest of this same group via correlated t-test and the changes average were considered using descriptive statistic. Dada was analyzed statistically via spss software (version 13.5).

#### *Result:*

The datas relevant to 30 experimental persons were examined with average age of 22/6 and high 177.1 cm that called experimental group and 15 persons with average age of 22.1 and high 174.4 cm that called control group who passed program regularly. Individual specifications of experimental persons have been shown in table (1). With obtained results after performing correlated t-test for each depended variables in both value group separately and too with attention to research hypothesis, were concluded that weight, fat mass, fat percentage and heart beat had a significant reduction in rest situation of experimental group. But increase in fatless mass was not significant in both experimental and control group. Certainly in spite of the fact that there wasn't any insignificant result in control group but a few changes were observed that perhaps these changes are at result of the lack of control the feeding program, physical activity, etc on examination persons. Result of the effects of skipping rope exercise on body composites and heart beat in rest situation have been shown in table(2).

**Table 1:** Individual specifications.

Variables group	Number	Age	Height
Experimental	15	22.6± 4.3	177.1± 7.4
Control	15	22.1±3.7	174.4±6.5

**Table 2:** Results of skipping rope test on the body compositions and beating of heart in rest situation.

Variables	group	Pretest	Past- test	p
Weight (kg)	Experimental	69.9 ±6.2	68.1± 4.4	0.015*
	Control	68.2 ±4.1	68.9 ± 3.8	0.071
Fat percentage (%)	Experimental	40.2 ± 3.1	36.5 ± 2.7	0.000*
	Control	38.6 ± 2.2	37.9 ± 3.1	0.112
Fat mass(kg)	Experimental	24.7 ±3.2	19.6 ± 1.9	0.008*
	Control	20.7 ±2.1	20.06± 0.9	0.521
Fatless mass (kg)	Experimental	43.4 ±5.3	44.34± 4.4	0.231
	Control	46.5 ± 3.4	46.6± 5.1	0.202
Beating of heart in rest situation (b.min <sup>-1</sup> )	Experimental	872.02±6.2	70.3 ± 4.1	0.000*

**Discussion:**

Findings of the present research about effect of skipping rope on the fat percentage and fat mass are conforming to the researches were done by: Ride and Shephard, Nouri Habashi, Fax and Matue's ideas, Skinner and et al., Gorun and et al. Shari and et al. Masoumi and Hamedian. While, results of Grant's researches and Despres are different. Various reasons can be stated for difference between results of the researches and this research. The important reason can be type of activity, because the physiology reason of this subject is understanding the mechanisms by which the necessary energy is used to muscular application, since the volume and time was considered, regarding the researchers' advices in a way that aero activity program shall be done and it is expected that while doing the mentioned exercise the fat acids are used by the muscles as the main energy resource and decreases body fat. So, aerobic exercise is considered as the main factor to decrease the body fat, but interference of the various variables such as feed, daily activity of examination persons and their situation before beginning the research can be other reasons of results deference [3,12,13]. Results of this research is conforming to researches of Despres and et al. and Zafeiridis from viewpoint of lack of significant change in fatless mass, but it is different from Gorun and et al reports, that one of the factors is exercises duration that their exercises was longed for 17 weeks (Gorun and et al.). And other factors which create the differences are exercises intensity [9].

Findings of the present research about effect of skipping rope on the total body weight was conforming to researches results of Despres and et al. Ogurik and et al. shari and et al., Masoumi and Hamedian. They were disagree to reports of Gorun and et al, Zafeiridis and Grant. The initial weight of under examination persons before test perhaps is the main reason of difference between the results which it was attempted to use the excess weighted under examination persons. The persons with more excessive weight before test, indicate more rapidity in their weight reduction, considering the results of the various researches [13,15]. Certainly, other factors like intensity and time o exercises and feeding can be noted as the factors of difference.

Skinner, Fax and Matuos and Masoumi's ideas are agree with effect of skipping rope on reduction of heart beat that skipping rope exercises are effective on reduction of heart beat in rest situation and increases heart efficiency, and receiving the blood volume becomes more according to Tomas, Andra, Ekman idea, and increase in heart contraction ability in blood pumpage due to regular sport activity (endurance, power and movement) can be reason for reducing heart beat in rest situation [11,16,17].

**Conclusion:**

Finally, according to the obtained results it was cleared that regular skipping rope exercises with the minimum facilities of time and cost for 8 weeks can have positive effect on body compositions that perhaps the fatless mass can be changed significantly by increasing the intensity and time of exercise.

According to the obtained results of this research, skipping the rope exercises can be effective on the weight, fat percentage, fat mass and heart beat in rest situation, since skipping the rope is an interesting and varied activity, thus it can be put in persons' exercise order who want to learn more benefit from physical activities in spite of medicine therapy.

**Competinginterest:**

This paper is obtained from research project with code 89-30/660-156 in Peyamenour university of Yazd province.

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