



EFFECTS OF AEROBIC TRAINING AND JUMP ROPE TRAINING ON BODY COMPOSITION OF OVERWEIGHT CHILDREN

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ABSTRACT

Objective: The objective of the present study to know the effects of aerobic training and jump rope training on body composition of overweight children.

Methods: Thirty children between 11 to 15 years were selected as subjects at random. The selected subjects were from School students of Mokokchung and Zunheboto Districts of Nagaland. They were assigned to experimental group-1, experimental group-2 and control group. The experimental group-1 (n=10, AT) and experimental group-2 (n=10, JRT) received aerobic training and jump rope training respectively for six weeks, five days a week. Body composition was measured by BMI- observations the score recorded in percentage (%).

Results: After 6 weeks, the aerobic training and jump rope training groups demonstrated significant reduction by 0.03% and 0.02% respectively rather than the control group.

Conclusion: The Percentage (%) of the body composition was greater reduced on aerobic training than the jump rope training.

KEYWORDS : 1. aerobic training 2. Jump rope training 3. Body composition 4. BMI observations

INTRODUCTION:

Aerobic metabolism plays a vital role in human performance and is basic to all sports, if for no other reason than recovery. Metabolically, the Krebs cycle and electron transport chain are the main pathways in energy production. Aerobic metabolism produces far more ATP energy than anaerobic metabolism and uses fats, carbohydrates and proteins. Many sports involve interactions between the aerobic and anaerobic metabolic systems and thus require appropriate training. (Dudley, G.A., and R. Djamil, 1985, Hickson, R.C, 1980) Today, rope jumping is often featured prominently as part sports training and fitness programs because it has proven itself as a valuable technique that provides a wide range of benefits and competitive advantages. Sports training benefits include increased speed, power, agility and explosiveness. Fitness benefits included weight loss, increased cardiovascular and anaerobic conditioning, and improved balance and coordination. When done properly, jump rope training can lead to dramatic improvement in sports performance. (Lee, 2010) Obese children and adolescents tend to become obese adults. According to Mossberg (1989), 80% of the obese adolescents lead to cases of adult obesity; although the childhood obesity does not contribute with over than 1/3 of the adult obesity (Braddon et al., 1986), the adult obese individuals who presented obesity in the childhood tend to be classified as having worse obesity than those who became obese when adults.

METHODOLOGY:

The study was formulated as pre and post test random group design, in which thirty subject were randomly assigned into three equal groups. They were assigned to experimental group-1, experimental group-2 and control group. The experimental group-1 (n=10, AT) and experimental group-2 (n=10, JRT) received aerobic training and jump rope training respectively for six weeks, five days a week. Body composition was measured by BMI- observations the score recorded in percentage (%). During training, the experimental groups underwent their respective training as per schedule given below. Control group maintained normal activities.

STATISTICAL ANALYSIS:

The collected pre and post data was critically analyzed with apt statistical tool of analysis of co-variance (ANCOVA), for observed the significant adjusted post-test mean difference of three groups. The Scheffe's post hoc test was used to find out pair-wise comparisons between groups. To test the hypothesis 0.05 level of significant was fixed in this study.

TRAINING APPROACHES**Training Schedule for experimental group I (Aerobic training)****Cardio Respiratory Training Zone:**

The optimum cardio respiratory zone is found between the 70 and 85 percent training intensities. However, individuals that have been physically inactive or are in the poor or fair cardio respiratory fitness categories should use 60 % intensity during the first few weeks of the exercise programme (Heyward 2002). As far as this study the intensity was fixed 30% to 40% of target heart rate.

Estimation of Maximal Heart Rate:

The subjects training heart rate were measured through the maximal heat method invented by Karvonen formula, i.e., (MHR-AGE)

Experimental Group-I- Aerobic Training (AT)

WEEKS	Intensity	Distance	Set	Recovery In-between Sets
1-2 WEEKS	30% (THR-100bpm)	1 km	2	-
3-4 WEEKS	35% (THR-110bpm)	1.5 km	2	5 min.
5-6 WEEKS	40% (THR-120bpm)	2 km	2	-

The duration of the training in the first instance was 1 to 2 weeks; with 30% intensity and distance covered being one kms. The duration of the next was three to four weeks. The distance covered was 1.5 Kms and the intensity was 35%. Finally it was five to six weeks duration. The distance covered was one to one and half Kms and the intensity recorded was 40%.

Training Schedule for experimental group II (Jump rope drills) Week 1 and 2

During the period the subjects performed the selected skipping drills. Totally 3 sets was given. They advised to perform only forty seconds of each drills. The 1 minute duration was allowed in between exercise. The 5 minutes was allowed to take rest in-between the set.

Week 3 and 4

During the period the subjects performed the selected skipping drills. Totally 3 sets was given. They advised to perform only fifty seconds of each drills. The 5 minutes was allowed to take rest in-between the set.

Week 5 and 6

During the period the subjects performed the selected skipping drills. Totally 3 sets was given. They advised to perform only sixty seconds of each drills. The 5 minutes was allowed to take rest in-between the set.

1-2-weeks

Activity	Repetition	Sets	Rec- in between repetition	Rec- in between sets
High step	Each 40 sec	3	1 min	5 min
Alternate –foot step				
Forward straddle				
The bounce step				
Bell jump				
Forward shuffle				
Back ward shuffle				
Half twist				
Full twist				
X foot cross				
Arm side swing				
Arm crossover				

3-4-weeks

Activity	Repetition	Sets	Rec- in between repetition	Rec- in between sets
High step	Each 50 sec	3	1 min	3 min
Alternate –foot step				
Forward straddle				
The bounce step				
Bell jump				
Forward shuffle				
Back ward shuffle				
Half twist				
Full twist				
X foot cross				
Arm side swing				
Arm crossover				

5-6-weeks

Activity	Repetition	Sets	Rec- in between repetition	Rec- in between sets
High step	Each 60 sec	3	1 min	3 min
Alternate –foot step				
Forward straddle				
The bounce step				
Bell jump				
Forward shuffle				
Back ward shuffle				
Half twist				
Full twist				
X foot cross				
Arm side swing				

TABLE I
THE RESULTS OF ANALYSIS OF COVARIANCE ON BODY COMPOSITION OF DIFFERENT GROUPS
(Scores in Percentage %)

Test Conditions	G1-AT	G2-JRT	G3-CG	SV	SS	Df	MS	'F' Ratio	
Pre test	Mean	27.66	27.00	27.30	B	2.16	2	1.08	0.81
	S.D.	0.89	1.18	1.19	W	36.11	27	1.34	
Post test	Mean	24.00	25.00	28.00	B	86.67	2	43.33	53.49*
	S.D.	1.00	0.89	0.63	W	22.00	27	0.81	
Adjusted post test	Mean	23.97	25.03	28.00	B	86.99	2	43.49	52.40*
					W	21.67	26	0.83	

* Significant at .05 level of confidence. The required table value for test the significance was 3.35, and 3.37, with the df of 2 and 27, 2 and 26.

RESULTS OF BODY COMPOSITION

The pre test mean and standard deviation on body composition scores G1, G2, and G3 were 27.66+0.89, 27.00+1.18, and 27.30+1.19, respectively. The obtained pre test F value of 0.81 was lesser than the required table F value 3.35. Hence the pre test means value of aerobic training; jump rope training and control group on body composition before start of the respective treatments were found to be insignificant at 0.05 level of confidence for the degrees of freedom 2 and 27. Thus this analysis confirmed that the random assignment of subjects into three groups were successful.

The post test mean and standard deviation on body composition scores G1, G2, and G3 were 24.00+1.00, 25.00+0.89, and 28.00+0.63, respectively. The obtained post test F value of 53.49 was greater than the required table F value of 3.35. Hence the post test means value of aerobic training and jump rope training on body composition was found to be significant at 0.05 level of confidence for the degrees of freedom 2 and 27. The results proved that aerobic training and jump rope training were produced significant improve rather than the control group of the sample populations.

The adjusted post test means on body composition scores of G1, G2 and G3 were 23.97, 25.03 and 28.00 respectively. The obtained adjusted post test F value of 52.40 was higher than the required table F value of 3.77. Hence the adjusted post test means value of aerobic training and jump rope training on body composition was found to be significant at 0.05 level of confidence for the degrees of freedom 2 and 26. The results confirm that aerobic training and jump rope training on body composition were produced significant difference among the groups. In order to find out the superiority effects among the treatment and control groups the Scheffe's post hoc test were administered. The outcomes of the same are presented in the table II

TABLE - I (a)
SCHEFFE'S POST HOC TEST MEAN DIFFERENCES ON AMONG THREE GROUPS ON BODY COMPOSITION
(Scores in percentage %)

G1-AT	G2-JRT	G3-CG	Mean Differences	Confidence Interval Value
23.97	25.03		1.06*	0.24
23.97		28.00	4.03*	0.24
	25.03	28.00	2.97*	0.24

* Significant at .05 level of confidence.

Result of Scheffe's post hoc test on Body Composition

Table I (a) shows the paired mean differences of aerobic training, jump rope training and control group on body composition. The paired wise comparisons results as follows.

First comparison: Group 1 and Group 2: The pair wise mean difference of group 1 and group 2 values 1.06 was higher than the confidential value of 0.24. Hence the first comparison was significant. The results of this comparison clearly proved that both training have produced significantly different improvements on body composition.

Second comparison: Group 1 and Group 3: The pair wise mean difference of group 1 and group 3 values 4.03 was higher than the confidential value of 0.24. Hence the second comparison was significant. The results of this comparison clearly proved that aerobic training have produced greater improvements on body composition than the control group.

Third comparison: Group 2 and Group 3: The pair wise mean difference of group 2 and group 3 values 2.97 was higher than the confidential value of 0.24. Hence the third comparison was significant. The results of this comparison clearly proved that jump rope training have produced greater improvements on body composition than the control group.

DISCUSSION ON BODY COMPOSITION

After analyzing the statistical end results the researcher found that the selected training groups have significantly improved the quality of body composition from the base line to post interventions. The pre to post intervention was present as follows. The aerobic training group from pre (27.66+0.89), to post (24.00+1.00) and jump rope training group from pre (27.00+1.18) to post (25.00+0.89) have significantly changed the pre to post results. The present study demonstrates an

increase in body composition performance of 0.03% and 0.02% for aerobic and jump rope training group respectively. The result of this study prove that the quality of performance body composition increased significantly over the six weeks training period for aerobic and jump rope training when comparing control group. However, the aerobic training group would produce better improvement than the other training namely jump rope training group. Further the jump rope training also produces better improvement on body composition than the control group. The control group did not show any significant changes on body composition. In BMI- observations, two experimental groups reduced the body composition significantly pre to post testing. The aerobic training group showed the greatest reduction in body composition than the jump rope training group and control group. The results of the present study were demonstrated positive effect of selected body composition of overweight children. This findings support, in line with the result of the following findings. A study effects of aerobic dance on cardiovascular level and body weight among women shown that a six-week long aerobic dance program would have a positive effect on body weight. (MohdFaridz Ahmad, Muhammad Amir Asyraf Rosli, 2015) The findings of the study effects of high intensity training and continuous endurance training on aerobic capacity and body composition denotes the continuous endurance training improved the reduction in body composition. (KunoHottenrott, Sebastian Ludyga and Stephan Schulze (2012). A study effects of 12 weeks of aerobic circuit training on aerobic capacity, muscular strength, and body composition in college-age women demonstrated the aerobic training produced significant improvement on body composition. (Mosher Patricia., et.al 1994) The findings from effects of aerobic training and strength training on body composition and bone mineral density of the middle and old aged people showed that aerobic exercise produce optimal effect on body composition. (J. Luo, 2012)

CONCLUSION

The results of this study indicate the percentage of body composition significantly reduced over six weeks training period for aerobic training and jump rope training.

The aerobic training was better in body composition than the jump rope training and control group. The jump rope training produces less reduction on body composition.

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