Effects Of Resistance Training On Relevant Fitness Components And Technical Performance Of Orthodox Boxers

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Abstract:
The main purpose of this study was to investigate the effects of resistance training program on the relevant fitness components and boxers technical performance who played at least any boxing tournament from inter club level to national level between age of 17 to 21 years of Telangana India. The thirty subjects employed for this study age: 19.20±1.33 years, body height: 170.40±3.50 cm, body weight: 62.20±3.97 kg, BMI: 21.44±1.52 kg/m². The resistance training program intervention on orthodox style boxers was carried out three days per week for 8 weeks comprising 24 sessions of 120 minutes each but the control group was participated in regular training. Relevant physical fitness variables were speed, arm strength and leg explosive strength and technical variables were straight punches (anaerobic 30sec.) and combination punches (aerobic type) were investigated pre test and post test. After 8 weeks of resistance training intervention significant differences were found among resistance training boxers. The control group had shown pre-test results even after 8 weeks duration. The coaches would be utilized this training for the enrichment of boxing techniques.
Keywords*: Resistance, anaerobic, aerobic, combination punches, explosive strength.*

Boxing is a combat sport that involves two individuals, known as boxers, who use their fists to throw punches at each other while following a set of rules. There are several types of boxers based on their style, strategy, and physical attributes. An orthodox boxer is a right-handed boxer who employs the standard boxing stance. In the orthodox stance, the boxer's left hand is positioned in front, closer to the opponent, while the right hand is held back closer to the body. The feet are usually shoulder-width apart, with the left foot slightly forward and the right foot positioned back.

The orthodox stance is the most common and traditional stances in boxing as most people are right-handed. It is also the opposite stance to the southpaw stance, which is used by left-handed boxers. When an orthodox boxer faces a southpaw boxer, their lead hands are aligned, which can create an interesting dynamic in the ring. It's worth noting that while the orthodox stance is considered the standard, boxers of any handedness can achieve success by adopting their own unique style and stance that suits their strengths and preferences.

Boxing performance is dependent upon several variables. These variables can include muscular Strength, Muscular Endurance, Speed, Power, Agility, Skill, Coordination, Knowledge and Instinct. It would therefore seem beneficial to be able to prescribe resistance training activities that were proven successful in eliciting "jab-like' muscular responses. Boxing trainers as a whole believe that resistance training makes for bulkier, slower fighters.

I.   Materials and Methods

Subjects
The experimental design was done on thirty (30) male orthodox boxers who played at least any boxing tournament from inter club level to national level between the ages of 17 to 21 years of Telangana, India and accomplished all study procedures with informed consent. The subjects (30) were divided into two equal groups, named as resistance training group N=15 and control group N=15. The resistance training group physical characteristics were (age: 19.20±1.33 years, body height: 170.40±3.50 cm, body weight: 62.20±3.97 kg, BMI:

21.44±1.52 kg/m^2) where as the control group characteristics were: (age: 19±1.41 years, body height: 169.93±2.26 cm, body weight: 61.40±3.59 kg, BMI: 21.27±1.10 kg/m^2)

Selection of the Variables

The scholar studied the scientific literature pertaining to fitness and performance variables of boxing and selected the appropriate fitness and performance variables. The Administrating feasibility in terms of availability of instruments, time factor from the point of view of subjects availability and expertise in the collection of data were also given due consideration. The variables were selected for the purposes of the experimental study were 1) Fitness components were: speed, arm strength and leg explosive strength. 2) Technical performance was: straight punches (anaerobic type for 30 sec.) and combination punches (aerobic type for maximum time combo 6 punches)

Exclusion criteria were: Present or past illness and injuries, regular boxing training are not considered for this study. All participants were knowledgeable about the study objectives, risks and benefits.

Research design

All participants were examined at baseline (Pre training program intervention) and after 8 weeks of resistance training (post training program interventions). All subjects were familiar with the measurements procedures. All measurements were taken up on the same day to avoid the performance differences. Participants were instructed not to consume any external medications and any vigorous activity in the 24 hours prior to assessing measurements. Required research assistants and experts in boxing were used for examining the participants. The resistance training program intervention was carried out three days per week for 8 weeks comprising 24 sessions of 120 minutes each. Within the training program the participants were informed to keep sufficient dietary intake as consistent as possible. However the control group subjects followed routine training protocol.

The test procedures were used by 60m run for testing speed, push-up for testing arm strength, standing broad jump for testing leg explosive strength, anaerobic 30sec. punching for straight punching ability and aerobic punching for testing combination punching ability (combo 6type punches).

Statistical tools used

The statistical analysis was used for processing results by the SPSS 22 package. The mean and standard deviation were computed for all parameters. Paired T-Test was used to test the mean difference between pre and post test results. Alfa was set at 0.05 levels.

Table No.1.   Statistical results on fitness components of Resistance and control groups

Related fitness components											
Groups	**60 m Run**		**M I & T value**	**Push-ups**		**M I & T value**	**Standing Broad Jump**		**M I & T value**		
	Pre:Mean	**Post:Mean**		**Pre:Mean**	**Post:Mean**		**Pre:Mean**	**Post:Mean**			
Resistance	7.63±0.37	7.31±0.42	4.19% 5.939 S	33.93±3.40	38±3.29	11.99% -15.25 S	1.97±0.12	2.06±0.11	4.56% -4.33 S		
Control	7.49±0.22	7.50±0.28	-0.13% -.141 NS	32.93±1.88	32.87±2.16	-0.18% .168 NS	2.03±0.07	2.04±0.07	0.49% -2.38 S		

*S-significant,*NS-not significant

Resistance group results during pre test and post test were not equal subsequent to 8 weeks of resistance training program. Post test presented significant enhancement in all fitness components. Regarding relative improvement between pre test and post tests, there were improvements in magnitude of related fitness components (e.g. 60m run, push-ups and standing broad jump) were significantly($p < 0.05$) improved in post test than pre tests by 4.19%,11.99% and 4.56% correspondingly. Whereas in control group enhancement in post test than pre test by -0.13%,-0.18% and 0.49%. The results were not equal following an 8 weeks period.

Table No.2. Statistical results on Technical performance of Resistance and control groups

Technical Performance						
Groups	**Straight Punches**		**M I & T value**	**Combination Punches**		**M I & T value**
	Pre:Mean	**Post:Mean**		**Pre:Mean**	**Post:Mean**	
Resistance	76±6.01	78.40±5.99	3.15% -9.431 S	1.95±0.27	1.98±0.27	1.53% -10.78 S
Control	76.20±2.43	76.13±2.85	-0.09% .151 NS	1.88±0.07	1.86±0.08	-1.06% 4.58 S

The table No.2 shows the results of resistance and control groups technical performance in boxing. Resistance group measurements pre-test to post were not also the same. Post test results significantly (p<0.05) improved in boxing technical performance like straight punches in anaerobic type for 30sec. and combination punches of aerobic type having 6 types of punches. The magnitude of increase was 3.15% and 1.53% in resistance training group but in control group -0.09% and -1.06%.

II.   Discussion on Results

The outcome of this study confirmed that resistance training program intervention significantly influenced the fitness abilities i.e. speed, arm strength and leg explosive strength as well as boxing punching abilities in straight punching anaerobic type for 30 sec. (Total number of punches) and combination punching (combo is a series of 6 six punches) maximum time for aerobic type among male orthodox boxers when comparing to pre test values and control group orthodox boxers. Supported study work by Xianqui Bu (2022) published in J Environ public health 5th July ,2022, concluded that speed strength levels improved and its significant impact on special striking speed and hitting on female boxers. Algirdas Cepulenas et.al. (2011) observed a 4 week mesocycle training program on elite Lithuanian boxers; the special physical training had a positive effect on the changes in indices of boxers' athletic fitness.

III.   Conclusion

Eight-week resistance training on related speed and strength of arm and leg muscles had a positive effect on the male orthodox boxers. Technical point of view there was also remarkable improvement observed in the orthodox style boxers punching abilities in straight and combination punches. This study proved that the increased capacity of anaerobic type of boxing and aerobic type of punching on bags certainly depends on related fitness abilities in support of speed and strength.

IV.   Recommendations

1. This study proved that resistance training would support boxing training and coaches should utilize these results for the enrichment of boxing techniques
2. Scholars also recommended that the similar type of study may be conducted on other styles of boxing.
3. Similar studies may be conducted on women boxers to confirm the present findings.

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