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Original article

IMPACT OF LOW, MEDIUM AND HIGH INTENSITY OF RESISTANCE TRAINING ON SOME SELECTED FITNESS VARIABLES AND MUSCULAR HYPERTROPHY AMONG UNDERWEIGHT MALES

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Abstract*

Introduction. An underweight individual are very lean, has very thin muscles and concerned about increasing weight and fitness level. Resistance training relates to an extensive activity leading to muscle contractions as a response to resistance to an external force. Resistance training (RT) Improves athletic performance in various sports and also maintains quality of life (Behringer, & et al, 2010). The purpose of this study was to find out the impact of low, medium and high intensity of resistance training on some selected fitness variables and muscular hypertrophy among underweight males.

Method. A group of (N=40) subjects was selected randomly to participate in this study. The age of the underweight participants was in the range of 18-24 years, resistance training program was employed for 12 weeks, two days in a week, 45 minutes of training per session. These participants were segregated into two groups namely Group-A (N=20, experimental group), Group -B (N=20 control group). The resistance training was employed on experimental group. Control group was not given any above mentioned special training program. The pre and posttest considered for the selected some fitness variables and test as follows; body composition (BMI), muscular power (standing long jump), speed (30.M sprint) and balance (standing on one leg test), for muscular hypertrophy (waist and hip ratio). To compare the mean differences from pre to post test, percentages with the help of calculator online, mean, standard deviation, and t-test was computed by the help of SPSS software.

Result and Discussion. The twelve weeks of training protocol had revealed significant performance from pre to posttest among the underweight males with regard to the selected fitness variables and muscular hypertrophy and presented by percentages i.e. BMI (increased by 3.49%), standing long jump (increased by 23.53%), 30. M Sprint economy (increased by 12.29%), standing on one leg test (increased by 83.87%), waist – hip ratio circumference (increased by 20.78%). The control group had not shown any changes pertaining to the selected fitness variables and muscular hypertrophy from pre to post test.

Conclusion. It is concluded that the impact of resistance training from pre to posttest had shown significant performance among the underweight males with regard to the selected fitness variables and muscular hypertrophy i.e. Body mass index, muscular power, speed, balance and waist-hip ratio. Lastly Control group had not shown any changes from pre to post test.

Key words: underweight, fitness, hypertrophy, performance.

Introduction

An underweight individual are very lean, has very thin muscles and concerned about increasing weight and fitness level. Resistance training(RT)relates to an extensive activity leading to muscle contractions as a response to resistance to an external force. Strength training is the ability of the muscles to repeat identical movement (Johnson. B. L, & et al, 1982). Strength training is the most essential part in the process of making an athlete and it enhances performances along with

success not only in rehabilitation, but in preventing injuries as well. Proper strength training yields benefits for any athlete young or old. As a result is stronger, faster , more flexible, more endurance and less likely to suffer from sports injuries. Strength training improve maximum strength, power or strength endurance and it leads to intensive demands on muscles, tendons, ligaments, and joints, (Daniel, 1982). Resistance training, also termed as weight training or strength training, is

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putting muscles against a resistance, to build strength, anaerobic endurance, or size of skeletal muscles. Moreover a well-organized schedule of physical activity includes strength training, to improve bone, joint function, bone density, muscle, tendon, and ligament strength, as well as improves heart and lung fitness, these activities will help in working all the major muscles of the body. Maximum range of motion is required in resistance training because muscle overload happens only at the specific joint angles where the muscles are worked. Resistance training improves athletic performance in various sports and also maintains quality of life (Behringer, 2010). Moreover, in this earlier study it was revealed that the training group has greater improvement in arm strength among the subjects after the strength training protocol. Strength training is one of the best training methods for improving the arm strength as well as the physical fitness of young men (Zahoor A B & et al, 2017). Weight training is beneficial for all athletes, and part of the athlete's training regime. Upper body strength is very important and part of the training program for the following sports men and women globally i.e., cricketers, basketball players, boxers, baseball players, wrestlers, judo players, etc, (Kaukab Azeem, et.al, 2014). Muscle strength increases with response to resistance training, (Bandy et al., 1990). Resistance training program is planned particularly to improve muscular strength and muscular endurance through proper technique, increased intensity gradually and may include the use of free weights, machine weights, elastic tubing, stretch bands, hydraulic machines or body weight exercises i.e. Push-ups, chin-ups (Stratton et al., 2004). Muscular endurance is the capability of the muscles to continue to perform without fatigue (Hardayal S, 1991). Speed is the ability to accomplish fast

successive movements over a short period of time in a given direction (Singh, 1991). Resistance training improves body composition, strength, among obese children and adolescents (Beedie, C., et al, 2016).

The objectives of this study as follows;

1. To design a suitable resistance training for underweight males
2. To facilitate and employ the training program on the underweight males.
3. To find out the influence of resistance training on underweight males on the selected some fitness variables and waist-hip ratio.
4. To find out the performance between the two groups i.e., (experimental group and control group).
5. Results will be analyzed for advising recommendations.

The purpose of this study was to find out the impact of low, medium and high intensity of resistance training on some selected fitness variables among underweight males.

Method

A group of 40 underweight students was selected randomly from the King Fahd University of Petroleum & minerals, Dhahran, Saudi Arabia. The age of the selected subjects was between 18 to 24 years. The selected participants were up to BMI of 18.5 were considered for this study and divided into two groups namely resistance training group (N=20), and control group (N=20). Experimental group (N=20) was engaged in the resistance training (low, medium and high intensity training) for 12 weeks, weekly 2 times, 45 minutes of training per session respectively. Control group was without specific training for 12 weeks, weekly 2 times and 45 minutes of per session. Control

group was not given any above mentioned special training program.

Some of the selected fitness variables are as follows, body composition, muscular power, speed and balance. The tests considered for this study was Body mass index (BMI), standing long jump, speed and balance and waist –hip ratio. BMI of subjects was find out by weight (kgs), height (meters), with the help of electronic weighting machine and stadiometre respectively, and

calculated with the help of simple calculation (weight in kgs/ height in (m)²). Selected fitness variables and waist –hip ratio were tested at the stadium by the help of standard sports equipment. The data was collected for pre and posttest and recorded. For analyzing the data from pre to post test the following statistical tools were considered, percentages with the help of calculator online, mean, standard deviation, and t-test, with the help of SPSS software.

Below Table-1, shows the details of dependent and independent variables

Sl. no	Some Selected Fitness Variables / Muscular hypertrophy	
1	Body composition	Dependent Variables
2	Muscular Power	
3	Speed	
4	Balance	
5	Waist –hip ratio	
1	Resistance training group	Independent Variables
2	Control group	

Below Table-2, shows the details of the Training Program

Sl.no	Description	Targets
1	Training program	12 weeks
2	Weekly	2 times
3	Training per session	45 min
4	Resistance Training (group-1) low, medium and high intensity of training program	10 exercises
5	Control group (group -2) Control group had not given any above mentioned special training program.	10 exercises
6	Test (Test was conducted before and after the 12 weeks of training program)	Pre and post test
7	Resistance training program was based on	FITT principle

Result and discussion

Analysis of the data pertaining to the experimental and control group for the selected fitness variables

among the underweight students from pre to post test is presented in the below table-3.

Below table-3, shows the analysis of data for the selected fitness variables and waist –hip ratio among the participants from pre to post test

Selected Fitness variables	Groups N=20	Pre-test		Post test		P Value
		Mean	S.D	Mean	S.D	
Body Composition	Experimental	17.46	0.78	18.07	0.37	0.00
	Control	17.33	0.76	17.29	0.73	0.35
Muscular Power	Experimental	1.70	0.19	2.10	0.23	0.00
	Control	1.69	0.17	1.70	0.17	0.14
Speed	Experimental	5.53	0.47	4.85	0.43	0.00
	Control	5.61	0.55	5.65	0.58	0.16
Balance	Experimental	0.31	0.02	0.57	0.35	0.00
	Control	0.37	0.21	0.35	0.21	0.31
Waist & hip ratio	Experimental	0.77	0.09	0.93	0.19	0.00
	Control	0.75	0.92	0.77	0.93	0.33

Analysis of the data pertaining to the experimental and control group for the selected fitness variables and muscular hypertrophy among the underweight participants from pre to post test is as follows; i.e. BMI ($P < 0.00$), muscular power ($p < 0.00$), speed

($p < 0.00$), balance ($p < 0.00$), and waist and hip ratio is also significant ($p < 0.00$). The control group had not shown any changes pertaining to the selected fitness variables and muscular hypertrophy from pre to post test.

Below table-4 shows the Percentages with regard to selected fitness variables and muscular hypertrophy from pre to posttest among the underweight males

Variables	Percentages	Increase/ Decrease
Body mass index	3.49%	Increase
Standing long jump	23.53%	Increase
30.M Sprint	12.29%	Increase
Standing on one leg test	83.87%	Increase
Waist –hip ratio	20.78%	Increase

The twelve weeks of training protocol had revealed significant performance from pre to posttest among the underweight males with regard to the selected fitness variables and muscular hypertrophy and presented by percentages i.e. BMI (increased by 3.49%), standing long jump (increased by 23.53%), 30. M Sprint economy (increased by 12.29%), standing on one leg test (increased by 83.87%), waist –hip ratio circumference (increased by 20.78%).

The purpose of this investigation was to find out the influence of Resistance training on the selected fitness variables among male participants.

Interestingly, for improving fitness level of the underweight males is a big challenge and needs systematic training, smart training, by starting the program sensibly with low intensity of training to get adjusted and go to the level of medium and high intensity of level. The important findings of this present study were significant performance was revealed among the subjects with regard to the training procedure from pre to post test on the selected fitness test i.e. Body mass index (BMI), standing long jump, speed, balance and waist –hip ratio. This is assumed that this training protocol is very sensible training approach for (UW) students.

(UW) students shouldn't directly expose to the medium or high intensity of exercise. The following studies are agreement with this present study; Arm strength increases due to strength training (Clayne R J & et al, 1979) .Previous research (Iftekhhar M &etal, 2016) discovered statistically significant relationship between physical fitness, body composition, and anthropometry among the subjects and had also revealed that regular exercise improved physical health.This is obvious that the two day training in a week is useful for the subjects in improving fitness level. Moreover, our research was limited by a lack of earlier studies directly investigating on underweight males.

Conclusion

It is concluded that the impact of resistance training from pre to posttest had shown significant performance among the underweight students with regard to the selected fitness variables i.e. Body mass index, muscular power, speed, balance and waist –hip ratio.Lastly Control group had not shown any changes from pre to post test.

Recommendation

- 1.It is recommended that the further research can be done with different intensities protocol on underweight males.
- 2.Similar study can be done with the intervention of a balanced diet program.
- 3.This is recommended to the Physical Education professional members to suggest the low, medium and high intensity training protocol for underweight males.
- 4.Similar studies can be done on different age groups.

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