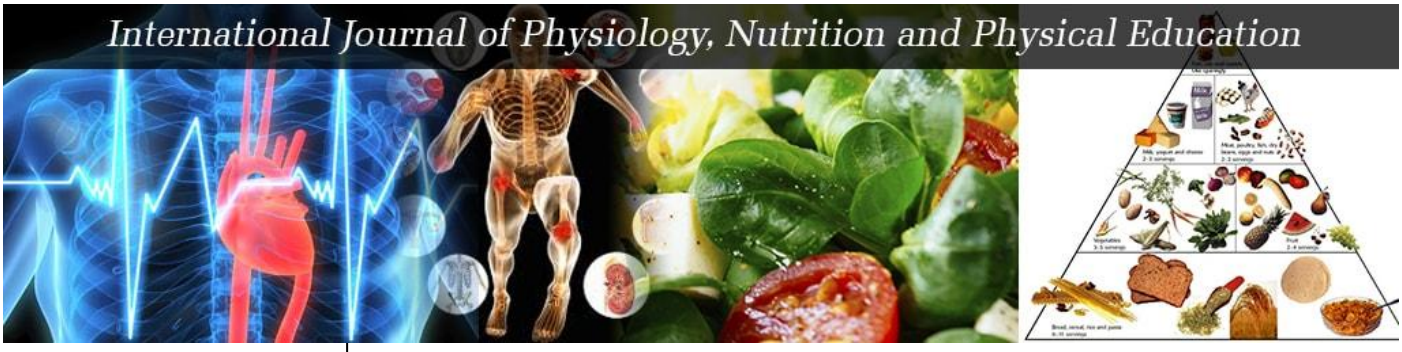

ISSN: 2456-0057
IJPNPE 2018; 3(1): 1802-1804

www.journalofsports.com
Received: 16-11-2017
Accepted: 17-12-2017

Amit Tomar
Research Scholar University of Delhi, New Delhi, India

Correspondence
Amit Tomar
Research Scholar University of Delhi, New Delhi, India

Effect of weight training and circuit training on selected strength and physiological variables of swimmers in Delhi district

Amit Tomar

Abstract
The aim of the study was to investigate the effect Effect of Weight Training and Circuit Training on Selected Strength and Physiological Variables of Swimmers in Delhi District. Total sample size is 45 which is divided into three group i.e. weight training, circuit training and control group and 15 sample were selected in each group. Random Sampling was used to select subject. ANCOVA was used as Statistical tools.

Keywords: Weight training, circuit training, swimmers and strength

Introduction
Correct form in weight training improves strength, muscle tone, and maintaining a healthy weight. Proper form will prevent any strains or fractures. When the exercise becomes difficult towards the end of a set, there is a temptation to cheat, i.e., to use poor form to recruit other muscle groups to assist the effort. Avoid heavy weight and keep the number of repetitions to a minimum. This may shift the effort to weaker muscles that cannot handle the weight. For example, the squat and the deadlift are used to exercise the largest muscles in the body—the leg and buttock muscles-so they require substantial weight. Beginners are tempted to round their back while performing these exercises. The relaxation of the spinal erectors which allows the lower back to round can cause shearing in the vertebrae of the lumbar spine, potentially damaging the spinal discs.

In addition to the basic principles of strength training, a further consideration added by weight training is the equipment used. Types of equipment include barbells, dumbbells, pulleys and stacks in the form of weight machines, and the body's own weight in the case of chin-ups and push-ups. Different types of weights will give different types of resistance, and often the same absolute weight can have different relative weights depending on the type of equipment used. For example, lifting 10 kilograms using a dumbbell sometimes requires more force than moving 10 kilograms on a weight stack if certain pulley arrangements are used. In other cases, the weight stack may require more force than the equivalent dumbbell weight due to additional torque or resistance in the machine. Additionally, although they may display the same weight stack, different machines may be heavier or lighter depending on the number of pulleys and their arrangements.

Circuit training is also been considered for a kind of weight training, typical circuit training workout includes about 8-10 exercise stations. After completing a station, instead of resting, you move quickly to the next station. A muscular strength and endurance circuit alternates muscle groups, such as upper body, lower body and core, so little or no rest is needed in between stations. This article focuses on another form of circuit training: aerobic + strength. This type of circuit alternates 1-2 sets of resistance exercise (body weight, free weights, dumbbells, kettle bells, bands, etc.), with brief bouts of cardiovascular exercise (jogging in place, stationary cycling, rowing, etc.) lasting anywhere from 30 seconds to 3 minutes. Depending on your goals and the number of circuit stations, you can complete 1 or more circuits in a 30-60 minute session.

Objective of the Study

The study is to determine the Effects of Weight Training and Circuit Training on Selected Strength and Physiological Variables of Swimmers in Delhi.

Delimitation

The study is further delimited to Delhi region. (South West)
The study is further delimited to Male Players.
The study is further delimited to the age group of 18-22.
The study is further delimited Swimming Players.

Sample of the Study

S. no	Category of the subjects	Number of Subjects
1.	Weight training Group	15
2.	Circuit Training group	15
3.	Control group	15
	Total subjects	45

Methods & Materials

Forty Five Swimmers of Delhi District, studying in various colleges were selected as subjects. The age of the subjects ranged from 18 to 22 years. The selected subjects were divided into three equal groups, each group consisted of 15 subjects, (In group -1) 15 subjects underwent weight training, (in group – II) 15 subjects underwent Circuit Training and (in group–III) 15 subjects acted as control group, which did not participate in any special activities apart from their regular curricular activities. The training period for weight training group and Circuit Training group was three days (alternative days) per week for twelve weeks.

The following variables were selected for the study: strength: leg strength, strength endurance and Physiological variable: vital capacity. The leg strength was assessed by using leg lift with dynamometer and it was recorded in kilograms, strength endurance was assessed by administering sit-ups test and it was recorded in numbers per minutes and vital capacity was assessed by using the wet spirometer and it was recorded in litters. Analysis of covariance (ANCOVA) was applied to find out the significant difference if any, among the experimental groups and control group on

Selected criterion variables separately. In all the cases,.05 level of confidence was fixed to test the significance, which was considered appropriate. Whenever the 'F' ratio was a significant in adjusted post-test mean, the Scheffé S was applied as post-hoc test.

Results and Discussion

The data collected on leg strength, strength endurance and vital capacity among weight training group, Circuit Training group and control group of Swimmers in Delhi were analyzed and presented in Table – 1.

Experimental and Control Groups.

Table 1: Analysis of Covariance on Selected Criterion Variables among

Variables	Pre – test & post test	Weight Training Group	Circuit Weight Training Group	Control Group	'F' Ratio
Leg Strength	Pre-test Mean ± S.D	77.13 ± 5.668	76.20 ± 5.48	77.13 ±	0.123
(in Kgs.)				6.664	
	Post-test Mean	79.33± 5.447	78.27 ± 5.59	76.40±	0.922
	± S.D			6.822	
	Adj. Post-test	79.027	78.879	76.094	27.104*
Mean					
Strength	Pre-test Mean ±	32.47 ± 3.226	30.67 ± 2.19	32.07 ±	1.555
Endurance	S.D			3.282	
(No./min)	Post-test Mean	35.27 ± 3.081	34.13 ± 2.20	31.20 ±	8.381*
	± S.D.			3.052	
	Adj. Post-test	34.680	34.987	30.933	31.22*
	Mean				
Vital	Pre-test Mean ±	3.43 ± 0.16	3.44 ± 1.40	3.43 ± 0.17	0.026
CapacityS.D					
(Litters)	Post-test Mean	3.67 ± 0.13	3.66 ± 0.15	3.42 ±	14.25*
	± S.D			0.873	
	Adj. Post-test	3.667	3.655	3.425	30.19*
	Mean				

*Significant 0.05 level of confidence. (The table values required for significance at.05 level of confidence with df 1 and 28 and 1 and 27 were 4.20 and 4.21 respectively).

Table – 1 shows that pre and post-test means 'f ratio of weight training group, Circuit Training group and control group on leg strength were 0.123 and 0.922, which was not significant (p>0.05). The adjusted post-test mean 'f' ratio value of experimental groups and control group was 27.104, which was significant (p<0.05). The pre and post-test means 'f ratio of weight training group, Circuit Training group and control group on strength endurances were 1.555, which was not significant (p>0.05) and 8.381, which was significant (p<0.05). The adjusted post-test mean 'f' ratio value of experimental groups and control group was 31.22, which was significant (p<0.05). The pre and post-test means 'f ratio of weight training group, Circuit Training group and control group on vital capacity was 0.026, which was not significant (p>0.05) and 14.25, which was significant (p>0.05). The adjusted post-test mean 'f' ratio value of experimental groups and control group was 30.19, which was significant (p>0.05).

Selected Criterion Variables
Adjusted Post-test Mean on Leg Strength

Table 2: Scheffe's Test for the Difference between the Adjusted Post-Test Mean on

Weight Training Group	Circuit Weight Training Group	Control Group	Mean Difference	Confidence interval at.05 level
79.027	---	76.094	2.933*	1.140067
79.027	78.879	---	0.148	1.140067
---	78.879	76.094	2.785*	1.140067
	Adjusted Post-test Mean on Strength endurances			
34.680	---	30.933	3.747*	1.444971
34.680	34.987	---	0.307	1.444971
---	34.987	30.933	4.054*	1.444971
	Adjusted Post-test Mean on Vital capacity			
3.667	---	3.425	0.242*	0.089348
3.667	3.655	---	0.012	0.089348
---	3.655	3.425	0.23*	0.089348

* Significant at.05 level of confidence.

Table – 2 shows that the Scheff S Test for the difference between adjusted post-test mean in leg strength of weight training group and control group (2.933) and Circuit Training group and control group (2.785), which were significant at.05 level of confidence. There was a significant difference in strength endurances between weight training group and control group (3.747) and Circuit Training group and control group (4.054) and also there was a significant difference on vital capacity between weight training group and control group (0.242) and Circuit Training group and control group (0.23) which was significant at 0.05 level of confidence after the respective training programme.

Conclusions

There was a significant improvement in leg strength after the weight training period and circuit weight training. There was a significant improvement in strength endurance due to weight training and circuit weight training. The improvement in vital capacity was significantly higher for weight training group and for Circuit Training group when compared with the control group. It was also found that there was no significant difference was found between the weight training group and Circuit Training group on selected criterion variables. Control group (3.747) and Circuit Training group and control group (4.054) and also there was a significant difference on vital capacity between weight training group and control group (0.242) and Circuit Training group and control group (0.23) which was significant at 0.05 level of confidence after the respective training programme.

References

1. Retrieved from http://en.wikipedia.org/wiki/Weight_training on 01-11- Jason Menoutis, Weight Training, 2014.retrieved fromhttp://www.peandhealth.com/Weight_Training.html on 21-05-2014.
2. Julie Wilcox. The Health Benefits of Weight Lifting and the New Science That Supports.
3. Strength, Retrieved from http://www.forbes.com/sites/juliewilcox/2012/05/31/health benefits-weightlifting/ 2/ on 28-3-2014.
4. Lonnie Soloff. The Benefits of Circuit Training, Retrieved from http://www.sparkpeople.com/resource/ fitness_articles. asp?id=267 on 22-02-2014.
5. Pastsy Neal. Coaching Method of Women, Massachussetts Addision Wesley Publishing Company, 1969, 15.
6. Raphael Brandon. Circuit Training: Weight Training Circuits will Improve Aerobic Fitness, Muscle Strength and Help Reduce Body Fat, Sports Performance Bulletin, Retrieved from http://www.pponline.co.uk/ encyc/circuit-trainingweight-training-circuits-will-improve-aerobicfitness-muscle-strength-and-help-reduce-body-fat-604# on 22-03 2014.
7. Frank W. Dick, Carl Johnson and Walf Paish, Strength Training for Athletics, (London: British Amateur Athletic Board, 1978, 6.
8. Retrievedfromhttp://wiki.answers.com/Q/How_does_long_term_exercise_effect vital_capacity on 25-04-2014.
9. Paul C. Godwin, Effect of Weight Training and Resistance Training on Selected Biomotor, Physiological and Skill Variables among Tamilnadu State Hockey Players, Unpublished Ph.D., Dissertation, (Tamilnadu Physical Education and Sports University, 2013.
10. G Rajamohan, P Kanagasabai, Suthakar Krishnaswamy, Annida Balakrishnan. Effect of Complex and Contrast Resistance and Plyometric Training on Selected Strength and Power Parameters, Journal of Experimental Science, 2010; 1(12):1-12.
11. LR Gettman, JJ Ayres, ML Pollock, Jackson A. The Effect of Circuit Trainingon Strength, Cardio -respiratory Function, and Body Composition of Adult Men, Journal of Medical Science in Sports. 1978; 10(3):171-6.
12. H. Kaikkonen, M. Yrjama, E. Siljander, P. Byman and R. Laukkanen, The Effect of Heart Rate Controlled Low Resistance Circuit Trainingand Endurance Training on Maximal Aerobic Power in Sedentary Adult, Scand J Med Sci Sports. 2000; 10(4):211-5.
13. A Subramanian. Investigation of Core Strength Training Induced Adaptations on Selected Physical and Physiological Parameters of Cricket Players, International Journal of Physical Education, Fitness and Sports. 2014; 3:(1):65-70.