American Journal of Science and Learning for Development
ISSN: 2835-2157
Volume 03 Number 01 (January) 2024
Impact Factor: 9.58
SJIF (2023): 5.349
www.inter-publishing.com

Improvement of the Selected Physical Variables by Circuit Training and Weight Training: A Survey among College Level Weight Lifters

Tapas Pramanik
Research Scholar, Department of Physical Education, Sunrise University

ABSTRACT
Athletes use sports training as a foundational approach to improve their physical performance. It is founded on scientific ideas and aims to improve performance and education. Enhancing overall health and organic functioning, as well as strengthening and stabilising the muscle-skeletal system, are all components of improving physical fitness. The goal of the current research is to determine how weight training and circuit training affect certain physical characteristics of college-level weightlifters. Sixty male college-level weightlifters from the Midnapore area in West Bengal, India, were chosen at random to serve as participants for this study. The age of the subjects ranged from 18 to 25 years. The selected subjects were randomly divided into four equal groups consisting of fifteen each such as experimental groups and control group and provided with the circuit training and weight training for 12 weeks. Equipments required for the collection of data were Handgrip Dynamometer, assistant, pen, record sheet, Bar bell, weight plates set and collar and Leg dynamometer. It has been found out in the study that the 12 weeks of circuit training and weight training have enhanced the physical variables of the subjects.

KEYWORDS: Sports Training, Performances, Weightlifters, Physical Variables, College Level.

Introduction: Weightlifting is now more widely regarded as a scientific sport that is performed by rational, intelligent, and even intelligent men. Success in this sport depends on both more fundamental traits like strength, endurance, and courage as well as more complex ones like coordination, mental agility and concentration, specific knowledge, skill, and speed.

Training and sports performances are closely interrelated with each other. Without training, there would be no prolific performances in sports and games at any level of competition. So all the coaches, physical trainers, physical education directors are really working hard to improve the performance of the athletes to earn many laurels for the clubs, the institution and the nations. Sports and games in the present world have become extremely competitive as it is not the mere participation that brings out victory to an individual. "Therefore sports career of the athlete is affected by various factors like physical condition, facing the opponents, tactical preparation, balanced aptitude, selection of equipments, creativity, appreciation from the society, perceiving tendency and methods of training etcetera. Sports training aims at education and performance enhancement based on scientific principles through physical exercise. It is a basic groundwork of sportsman for elite performance. The development of physical fitness includes organic functions and increasing the strength and stability of the musculoskeletal system", (Singh, 1991)

"The circuit weight training and interval training are admired training methods for maximizing time-efficiency, and are purported to deliver greater physiological benefits faster than traditional training methods. Adding interval training into a circuit weight-training workout may further enhance the benefits of circuit weight training by placing increased demands upon the cardiovascular system" (Skidmore, et al. 2012).

2835-2157 /© 2024 The Authors. Published by Academic Journal INC. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/bync-nd/4.0/)

American Journal of Science and Learning for Development
ISSN: 2835-2157
Volume 03 Number 01 (January) 2024
Impact Factor: 9.58
SJIF (2023): 5.349
www.inter-publishing.com

Statement of the Problem: The function of the study was to discover the circuit training, weight training on selected hand grip strength, leg strength, maximum strength, among college level weight lifters. The researcher has made an effort to investigate how college-level weight lifters' use of circuit training and weight training affects certain physical factors. There is a dearth of literature on weightlifting teaching, and even less research studies have been conducted on weightlifters. This inspired the investigator to begin the study named "**Improvement of the Selected Physical Variables by Circuit Training and Weight Training: A Survey among College Level Weight Lifters".**

Objectives: The present study has been undertaken to find out the impact of circuit training and weight training on the selected physical variables of the college level weight lifters.

Hypothesis: In the current research, it is hypothesised that weight training and circuit training will significantly enhance the chosen physical characteristics of college-level weight lifters.

Method:

Sample: The study's goal was to determine the effects of circuit training and weight training on certain physical characteristics in college-level weightlifters. Sixty male college-level weightlifters from the Midnapore area in West Bengal, India, were chosen at random to serve as participants for this study. The individuals' ages varied from 18 to 25 years old.

The chosen participants were split into four equal groups, each with fifteen members: the experimental group and the control group. The experimental group engaged in circuit training, which included weight training three days a week for one hour each morning for a total of twelve weeks.

Selection of Variables:

Independent Variables: Circuit Training and Weight Training

Dependent Variables: 1. Hand grip strength 2. Maximum strength and 3. Leg strength

Tools:

Hand grip strength: The function of this test is to measure the maximum isometric strength of the hand and forearm muscles. Equipment required was Handgrip Dynamometer, assistant, pen and record sheet.

Maximum Strength (1RM bench press): To measure the maximum strength of subjects. Equipment required was Bar bell, weight plates set and collar.

Leg strength: To measures the back and leg strength. Equipment required is Leg dynamometer.

Collection and Administration of data: Pre-test data were collected three days before the commencing of treatment period and post test data were collected immediately after completion of experimental treatment period for groups namely circuit training, weight training. The collected data were processed with appropriate statistical techniques of mean, SD and t test.

Data Analysis and Interpretation:

Table 1-The summary of mean and dependent't' test for the pre and post tests on hand grip strength of experimental and control groups

Mean	Circuit Training Group–(I)	Weight Training Group –(II)	Control Group–(IV)
Pre-test	58.99	59.34	59.52
SD(±)	0.72	0.95	0.84
Post-test	62.19	62.47	60.29

2835-2157 /© 2024 The Authors. Published by Academic Journal INC. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/bync-nd/4.0/)

American Journal of Science and Learning for Development
ISSN: 2835-2157
Volume 03 Number 01 (January) 2024
Impact Factor: 9.58
SJIF (2023): 5.349
www.inter-publishing.com

SD(±)	0.72	0.92	2.28
't'-test	13.63	9.46	1.12

Table 1 shows that the dependent "t" test values are 13.63, 9.46, and 1.12, respectively, between the pre and post-test averages for the circuit training group and the weight training group. Given that the experimental groups' computed "t"-test values are higher than the table value of 2.15 with df 14 at the 0.05 level of confidence. It is concluded that pre and post-test means of circuit training group and weight training group have registered significant improvement in performance of hand grip strength. The control group's "t" test values are 1.12, which is less than the required table value and indicates that there was not a significant improvement on grip strength due to their lack of specific training.

Table 2-the summary of mean and dependent 't' test for the pre and post tests on maximum strength of experimental and control groups

Mean	Circuit Training Group–(I)	Weight Training Group –(II)	Control Group–(IV)
Pre-test	80.71	80.86	80.84
SD(±)	1.269	1.23	1.15
Post-test	87.68	87.54	82.27
SD(±)	1.517	1.64	2.97
't'-test	14.49*	11.98*	1.95

The dependent "t" test values between the pre- and post-test averages of the circuit training group and the weight training group are 14.49, 11.98, and 1.95, respectively, according to Table 2. Given that the experimental groups' computed "t"-test values are higher than the table value of 2.15 with df 14 at the 0.05 level of confidence. Because the control group did not receive any specific training, their "t" test value of 1.95 is less than the required table value, indicating that there was no significant improvement in their maximum strength. In contrast, the weight training and circuit training groups' pre- and post-test means showed a significant improvement in their maximum strength performance.

Table 3-the summary of mean and dependent't' test for the pre and post tests on leg strength of experimental and control groups

Mean	Circuit Training Group–(I)	Weight Training Group –(II)	Control Group–(IV)
Pre-test	52.16	52.39	51.97
SD(±)	1.093	1.33	1.255
Post-test	56.74	57.44	53.12
SD(±)	1.319	0.99	3.071
't'-test	10.07	13.88	1.55

Table 3 shows that the dependent "t" test values are 10.07, 13.88, and 1.55, respectively, between the pre- and post-test averages for the weight training group and the circuit training group. Given that the experimental groups' computed "t"-test values are higher than the table value of 2.15 with df 14 at the 0.05 level of confidence. It was determined that the pre and post-test means of the circuit training group and the weight training group had registered significant improvements in performance of leg strength. The "t" test values of the control group, 1.55, which is less than the required table value, indicate that there was not a significant improvement on leg strength due to their not having received any specific training.

2835-2157 /© 2024 The Authors. Published by Academic Journal INC. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/bync-nd/4.0/)

American Journal of Science and Learning for Development
ISSN: 2835-2157
Volume 03 Number 01 (January) 2024
Impact Factor: 9.58
SJIF (2023): 5.349
www.inter-publishing.com

Findings:

1. Circuit training group, weight training group has registered significant improvement in performance of hand grip strength
2. Maximum strength of the selected subjects has been significantly improved by the circuit training and weight training.
3. Circuit training group, weight training group has registered significant improvement in performance of leg strength.

Conclusion: The result of the present study clearly indicates that circuit training, weight training packages could enhance the performance level of weight lifters in almost all the selected physical variables. Hence it is recommended that coaches/physical educators should give due importance to circuit training, weight training packages in their schedule.

References:

1. Amit Tomar (2017). Effect of weight training and circuit training on selected strength and physiological variables of swimmers in Delhi District. *International Journal of Yoga, Physiotherapy and Physical Education.* Vol 2(5).
2. Binodh, C.R., and Mohan, K (2016). Impact of weight training on selected biochemical variables among weight lifters. *Journal of physical education and allied health science*.vol 6 (1).ISSN;2249-2380.
3. Ebrahim, K., Koozechian, M.(2006) "The principles of sport physiology for fitness-performance and health". *Shahid Beheshti University Press.*
4. Flores, F.J., Sedano, S., and Redondo, J.C. (2017). Optimal Load and Power Spectrum *During Jerk and Back Jerk in Competitive Weightlifters. Journal of Strength Conditioning research*, 31(3):809-816.
5. Justin, C., Strickland, and Mark, A.(2014). Smith*The anxiolytic effects of resistance exercise. *Front Psychol*, 5: 753 .
6. Kala, C., and Gokulakrishnan, D (2015) Effect of Concurrent Resistance and Plyometric Training on Selected Physical Variables among College Women Volleyball Players. *International Journal of Recent Research and Applied Studies*, 1(7), 31 - 36.
7. Ronnestad, B.R., Kvamme, N.H., Sunde, A., Raastad, T. (2008). Short-term effects of strength and plyometric training on sprint and jump performance in professional soccer players. *J Strength Cond Res.* 22(3):773-80. doi: 10.1519/JSC.0b013e31816a5e86.
8. Singh,Hardayal.,(1991) Science of Sports Training. *New Delhi: DVS. Publications.*
9. Skidmore, B.L., Margaret, T., Jones, Mark B., and Tracey, D.M (2012). Acute Effects of Three Different Circuit Weight Training Protocols on Blood Lactate, *Heart Rate, and Rating of Perceived Exertion in Recreationally Active Women. J Sports Sci Med*. 11(4): 660–668.
10. Smith , D. J. (2003). A framework for understanding the training process leading to elite performance. *Sports medicine*. 33(15):1103-26.
11. Srinivas Reddy and Ramesh Reddy, (2014). Effect Of Plyometric Training,Circuit Training And Combined Training On Selected Muscular Srtength And Muscular Power Among The Secondary Girls Students, *International Journal of Health, Physical Education and Computer Science in Sports Vol 15(1), pp101*-112. ISSN 2231-3265.

2835-2157 /© 2024 The Authors. Published by Academic Journal INC. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/bync-nd/4.0/)