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Analysis of Bulgarian bag training, Swiss ball training and combined training on selected anthropometric variables among volleyball players

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***Abstract*---**Context: Analysis the impact of Bulgarian bag training, Swiss ball training and combined training on selected anthropometric variables of volleyball players. Aim: This study aims to identify the Bulgarian bag training, Swiss ball training and combined training on selected anthropometric variables of volleyball players. Material and Methods: The study was confined to 60 volleyball players from Madurai district, Tamilnadu, India. Their age ranged from 18 to 25 years. The selected subjects were divided in to four groups namely Bulgarian bag training, Swiss ball training, combined training and control group, each group consisting of 15 subjects. The study was conducted on dependent variables such as Biceps girth. Statistical Analysis Used: Analysis the impact of Bulgarian bag training, Swiss ball training and combined training on selected anthropometric variables of volleyball players. were tested by Analysis of Co-variance (ANCOVA) would be applied to find out the significant improvement on them, the results were significant, the Schiff's post hoc test would be used to find out the paired mean differences. In all the cases the 0.05 level of confidence would be fixed was applied to determine whether the programs of training produced significantly different improvements in Biceps girth after Twelve weeks of training. Results: To find out difference between experimental and control group of Biceps girth. The post-test means of the Bulgarian bag training, Swiss ball training, combined training and control groups were 32.80, 32.98, 34.45 and 30.94 respectively. The obtained F-ratio for the post-test was 25.36 and the table F-ratio was 2.76. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 56. This proved that the differences between the post-

test means of the subjects were significant. The adjusted post-test means of the Bulgarian bag training, Swiss ball training, combined training and control groups were 32.78, 33.02, 34.39 and 30.98 respectively. The obtained F-ratio for the adjusted post-test means was 23.69 and the table F-ratio was 2.77. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 55. This proved that there was a significant difference among the means due to the experimental trainings on biceps girth. Conclusion: The results of the study indicate that the experimental groups namely Bulgarian bag training, Swiss ball training, combined training group have significant improvement in Biceps girth among Volleyball players after undergoing Bulgarian bag training, Swiss ball training, combined training for a period of Twelve weeks.

***Keywords*---**Bulgarian bag training, Swiss ball training, Biceps girth, Volleyball.

Introduction

Bulgarian bag training

The Bulgarian bag was invented by Ivan Ivanov at around 2005. Ivanov, a former Bulgarian Olympic athlete, who worked as a U.S. Olympic wrestling coach at the Olympic training centre in Marquette, Michigan, and was looking for a training tool that would allow his wrestlers to improve explosive actions and dynamic movements involved in pushing, twisting, swinging, pulling, bending, rotating, squatting, lunging and throwing. Ivanov was inspired by the tradition of shepherds performing strength acts with sheep and goats on street fairs in his native Bulgaria. The shepherds were often forced to carry lambs and weak sheep around their shoulders when they were wandering with their herds, and were showing off their strength at festivals. Ivanov based the design of his tool on the body of an ovine and saw its use as a modern interpretation of the old tradition.

Swiss ball training

An exercise ball is a ball constructed of soft elastic with a diameter of approximately 35 to 85 centimetres (14 to 34 inches) and filled with air. The air pressure is changed by removing a valve stem and either filling with air or letting the ball deflate. It is most often used in physical therapy, athletic training and exercise. It can also be used for weight training. The ball, while often referred to as a Swiss ball, is also known by a number of different names, including balance ball, birth ball, body ball, ball, fitness ball, gym ball, gymnastic ball, physio ball, Pilates ball, Pezzi ball, sports ball, stability ball, Swedish ball, therapy ball, or yoga ball (Chek, 1996). The concept of ball exercises was imported from Europe to America by Joanne Posner Mayer in the late 1980s. She was the first to really promote the use of ball exercises in the fitness industry specifically.

Volleyball

Volleyball is a team sport in which two teams of six players are separated by a net. Each team tries to score points by grounding a ball on the other team's court under organized rules ("Volleyball "International Olympic Committee). It has been a part of the official program of the Summer Olympic Games since 1964.The complete rules are extensive. But simply, play proceeds as follows: a player on one of the teams begins a 'rally' by serving the ball (tossing or releasing it and then hitting it with a hand or arm), from behind the back boundary line of the court, over the net, and into the receiving team's court. The receiving team must not let the ball be grounded within their court. The team may touch the ball up to 3 times but individual players may not touch the ball twice consecutively. Typically, the first two touches are used to set up for an attack, an attempt to direct the ball back over the net in such a way that the serving team is unable to prevent it from being grounded in their court. The rally continues, with each team allowed as many as three consecutive touches, until either (1): a team makes a kill, grounding the ball on the opponent's court and winning the rally; or (2): a team commits a fault and loses the rally. The team that wins the rally is awarded a point, and serves the ball to start the next rally.

Anthropometry

An early tool of physical anthropology, it has been used for identification, for the purposes of understanding human physical variation, in palaeoanthropology and in various attempts to correlate physical with racial and psychological traits. Anthropometry involves the systematic measurement of the physical properties of the human body, primarily dimensional descriptors of body size and shape.
Biceps girth

Biceps girth is a measure of the circumference of the upper arm (ISAK, 2007)
Statement of the Problem

To achieve the purpose of the study was to Analysis of Bulgarian bag training, Swiss ball training and combined training on selected Anthropometric variables among volleyball players.

Methodology

The purpose of the study was to find out the effect of Bulgarian bag training, Swiss ball training and combined training on Biceps Girth among volleyball players. To achieve the purpose of the present study, sixty college volleyball players from Madurai, Tamilnadu, India were selected as subjects at random and their age ranged from 18 to 25 years. The subjects were divided into four equal groups of fifteen each. Group I acted as Experimental Group I (Bulgarian bag training), Group II acted as Experimental Group II (Swiss ball training), Group III acted as Experimental Group III (Combined training) and Group IV acted as Control Group. The requirement of the experiment procedures, testing as well as exercise schedule was explained to the subjects so as to get full co-operation of the effort required on their part and prior to the administration of the study.

Testing Procedure Mark, a point on the arm halfway between the acromion and olecranon. This marks the vertical level at which the circumference will be measured. It is important that this measurement is made with the arm flexed, otherwise the tape takes an oblique course across the upper arm, and the mid-point is too high up. Scoring Maximum circumference of the biceps girth was recorded as a score in centimetres.

Training programme

During the training period the experimental groups underwent their respective training programme in addition to their daily regular activities as per the schedule. Experimental groups namely Bulgarian bag training, Swiss ball training and combined training underwent their respective experimental training on three alternate days per week for twelve weeks. The experimental training programmes were designed based on the resources collected from books, periodicals, e-materials and discussions with the experts. The duration of experimental training was planned for 60 minutes. The Bulgarian bag training programme lasted for a session in the morning between 6.30 and 7.30 a.m. for three alternate days in a week (Monday, Wednesday and Friday). The Swiss ball training programme lasted for a session in the morning between 6.30 and 7.30 a.m. for three alternate days in a week (Tuesday, Thursday and Saturday). The combined training programme lasted for a session in the evening between 4.30 and 5.30 p.m. for three alternate days in a week (Monday, Wednesday and Friday).

Table 1
Computation of analysis of covariance of bulgarian bag training swissball training combined training and control groups on biceps girth (in centimetres)

	BBTG	SBTG	COTG	CG	Source of Variance	Sum of Squares	df	Means Squares	F-ratio
Pre-Test Means	31.21	31.01	31.34	31.00	BG	1.227	3	0.409	0.90
					WG	25.261	56	0.451	
Post-Test Means	32.80	32.98	34.45	30.94	BG	93.418	3	31.139	25.36*
					WG	68.751	56	1.228	
Adjusted Post-Test Means	32.78	33.02	34.39	30.98	BS	85.976	3	28.659	23.69*
					WS	66.511	55	1.209	

BG- Between Group
WG- Within Group
df- Degrees of Freedom

* - Significant
(Table Value for 0.05 Level for df 3 & 56 = 2.76)
(Table Value for 0.05 Level for df 3 & 55 = 2.77)

Table 1.1
The scheffe's test for the differences between the adjusted post test means on biceps girth

Adjusted Post-Test Means				Mean Difference	Confidence Interval
BBTG	SBTG	COTG	CG		
32.78	33.02	--	--	0.24	1.15
32.78	--	34.39	--	1.61*	
32.78	--	--	30.98	1.80*	
--	33.02	34.39	--	1.37*	
--	33.02	--	30.98	2.04*	
--	--	34.39	30.98	3.41*	

** Significant at 0.05 level of confidence*

Data analysis

An examination of table - 1 indicated that the pre-test means of Bulgarian bag training, Swiss ball training, combined training and control groups were 31.21, 31.01, 31.34 and 31.00 respectively. The obtained F-ratio for the pre-test was 0.90 and the table F-ratio was 2.76. Hence the pre-test mean F-ratio was insignificant at 0.05 level of confidence for the degree of freedom 3 and 56. This established that there was no significant difference between the experimental and control groups indicating that the procedure of randomization of the groups was ideal while conveying the subjects to groups. The post-test means of the Bulgarian bag training, Swiss ball training, combined training and control groups were 32.80, 32.98, 34.45 and 30.94 respectively. The obtained F-ratio for the post-test was 25.36 and the table F-ratio was 2.76. Hence the post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 56. This proved that the differences between the post-test means of the subjects were significant. The adjusted post-test means of the Bulgarian bag training, Swiss ball training, combined training and control groups were 32.78, 33.02, 34.39 and 30.98 respectively. The obtained F-ratio for the adjusted post-test means was 23.69 and the table F-ratio was 2.77. Hence the adjusted post-test mean F-ratio was significant at 0.05 level of confidence for the degree of freedom 3 and 55. This proved that there was a significant difference among the means due to the experimental trainings on biceps girth. Since significant differences were recorded, the results were subjected to post hoc analysis using Scheffe's post hoc test. The results were presented in Table-1.1

The multiple comparisons showed in Table 1.1 proved that there existed significant differences between the adjusted means of Bulgarian bag training & combined group (1.61), Bulgarian bag training & control group (1.80), Swiss ball training & combined group (1.37), Swiss ball training & control group (2.04) and combined group & control group (3.41). There was no significant difference between Bulgarian bag training and Swiss ball training group (0.24) at 0.05 level of confidence with the confidence interval value of 1.15.

Results

The results reveal that the selected variable Biceps Girth, were significantly improved due to the 12 weeks of Bulgarian bag training, Swiss ball training and Combined group training at 0.05 level of significance and the hypothesis was accepted.

Discussions

The findings of the study proved that there was a significant difference between Bulgarian bag training and Swiss ball training group Combined group and control groups. Thus, twelve weeks of tentative treatment increases in Biceps Girth compared to control group. However, there was significant difference between experimental groups on Biceps girth.

Conclusions

From the analysis of the data, the following conclusions were drawn.

1. The result of the study shows that Bulgarian bag training increases Biceps Girth when compare with control group.
2. The result of the study shows that Swiss ball training increases Biceps when compare with control group.
3. The result of the study shows that Combined training increase Biceps when compare with control group.
4. Combined training may have better effect to increases Biceps of Volleyball players.

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Conflicts of interest
There are no conflicts of interest.

References

1. Barrow, H. M. & McGee, R. M. (1979). *A Practical Approach to Measurement in Physical Education*, Philadelphia: Lea and Febiger.
2. Baumgartner, T, A., Andrew, S. J., Matthew, T. M., & David, A. R. (2003). *Measurement for Evaluation in Physical Education & Exercise Science.* New York: Mc-Graw Hill.
3. Bompa, Tudur, O. (2000). *Total Training for Young Champions*. Human Kinetics Publishers, Inc. United States.
4. Dick Frank W. (1997). *Sports Training Principles*, London: A&C Black Publishers Ltd.,
5. Fox, Edward, L. (1984). *Sports Physiology.* Philadelphia: Saunders College Publishers.
6. Fox, Edward. L, Richard Bowers and Merle L. Foss. (1993). *The Physiological Basis for Exercise and Sport* (5th ed). Dubuque, Iowa:WCB Brown and Bench Mark Publishers.

7. Safrit, M. J. (1986). *Introduction to Measurement in Physical Education and Exercise Science,* Toronto: Times Mirror/Mosby College Publishing.
8. Singh, H. (1991). *Science of Sports Training*. New Delhi: D.V.S. Publications. Chen, X.R. (1989). *Handbook of Volleyball*, Si Chuan Dictionary Press.
9. Chen, X.R. (2005). *Volleyball.* Beijing: Higher Education Press.Li, A.G. (1995). *Modern Volleyball*, Peoples' Sport Press.
10. Marfell, J, M., Olds, T., Stewart, A. & Cater, L.J.E. (2006). *International Standard for Anthropomerty Assessement*, ISAK, Potchefstroom.