

The Effect of Three Different Training Methods on Motor and Psychological Variables among Men Volleyball Players

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Abstract

The purpose of the present study was to investigate the effect of resistance training, motivational training and combined training on selected physical variables (Explosive Power), psychological variable (Achievement motivation) in their service ability among volleyball players. 60 male volleyball players of age between 18 and 23 years were randomly selected from the Velammal Engineering college, Surapet, Chennai, Tamilnadu volleyball players among those who had represented the college in the open tournaments and those who expressed their willingness to participate in the current study. Three groups at random were formed, as Resistance Training Group (RTG) (n=20), Motivation Training Group (MTG)(n=20) and Combined Training Group (CTG)(n=20). RTG underwent selected volleyball specific resistance training for 6 weeks, MTG underwent motivation training and the CTG performed the resistance training and motivation training. The obtained Data were analyzed using ANCOVA. Based on the obtained results it was concluded that Combined Training Group (CTG) has the highest potential for improving the explosive power and volleyball serving ability. Resistance Training Group (RTG) contrary to the expectation added excellently enhanced the Achievement Motivation. Motivation Training has helped the players to achieve the necessary motor fitness and serving ability in general.

Keywords: Resistance training, Explosive Power, Motivational Training, Achievement motivation, Volleyball Serving Ability

INTRODUCTION

The game of Volleyball is being played by many countries and it is a very popular game in India. In Volleyball, at any level of competition, service is an important technique which one should have master over. A Volleyball team should possess the good service technique in order to win big matches. The opponent teams will feel tough to play against the good service oriented teams. The good service can create clearly a tough situation which leads to the winning. If the serve is placed accurately, the setting becomes complicated to the opponents and the spikers could not perform perfect smashes. The fact that the good team will lose the match, If the team does not have mastery over good service techniques like placement, spins, and power. So every team should have an excellent skill of service in order to be a best team.

LITERATURE REVIEW

Shoenfelt & Griffith (2008) [7] made a preseason mental skills program for serving was implemented for the 11 members of an intercollegiate volleyball team (M age = 20.0 yr.; SD= 1.1; years of intercollegiate volleyball experience M = 2.6; SD = 0.9). Key mental skills taught were relaxation, imagery, intentional focus, goal setting, behavioural modelling, and performance routine. A videotaped behavioural model articulated and demonstrated technical performance keys to effective serving. Players utilized a three-phase service routine to increase automaticity of performance and to incorporate key mental skills. End-of-season reported use of imagery was significantly correlated with Good Serve Percentage, as was reported use of a service routine. The mean Good Serve Percentage for the season was 49% (SD = 7); the team goal was 50%. Serve-specific self-efficacy significantly increased from the pertaining program to the end of the season. Results indicated that implementing the mental skills training program was associated with enhanced service performance.

The study of Yiannis & Panagiotis (2005) [8] compared the effectiveness of the five principal skills in men's Volleyball (serve, reception, attack, block and dig) between the Sydney 2000 and the Athens 2004 Olympic Games and examined to what extent the observed changes were connected with the implementation of the new rules in Volleyball. The findings revealed a universal tendency of the elite men's volleyball teams to enhance their defence by reducing their block and dig faults. On the contrary there was an increase of the reception faults as a result of the improvement of the service effectiveness. The above changes reflected the teams' shift of tactics to win more points from their own serve. This tactical development became more imperative after the introduction of the rally-point system, which reduced the number of points played per set, and hence the teams' opportunities of gaining the minimum two-point advantage in order to win the set. Nonetheless, the Athens gold-medallist team of Brazil showed, in addition to the above, remarkable

reception effectiveness which led to an outstanding attack capability, thus re-establishing the attack as the most important skill in volleyball.

Garfield Bester [1] in his study examined how athletes were generally motivated as well as during practice and competitions. He identified two types of motivation, failure avoidance and the pursuit of success. Athletes (hockey, athletics and rugby) took part in the investigation. The results of the investigation revealed that: Failure avoidance is significantly more prominent than the pursuit of success when it comes to sport in general and during training sessions. As far as competition is concerned, the pursuit of success as a motivational approach was significantly higher than the avoidance of failure. The avoidance of failure as a motivational approach was significantly higher for males compared to female athletes. Grade 10 athletes displayed significantly less failure avoidance than Grade 12 athletes. Athletes who participated in team sport showed a significantly higher level of failure avoidance as a motivational approach compared to individual athletes.

Achievement motivation is one type of motivation that helps to determine how and why an individual has behaved in a certain way [6]. It investigates what gives some people “drive” and some don’t. This has led to research and to the development of achievement motivation theory. The need for achievement has led many researchers to investigate why and what makes people do and achieve different things. Many wanted to explain the factors involved in high and low achieving personalities.

Hence it is inevitable skill necessary to score more points during serving opportunities since the total number of points scored during a set was reduced due to the rally point system. Skill to serve effective and to add difficulty level in the serve and placing a serve in a difficult place on the court to disadvantage perfect setting sequence has become an important element in the training process of training. Also, every player must have a proper motivation to adopt serving as an important skill to acquire.

METHODS AND MATERIALS

Taking into consideration all the above qualities, himself being a volleyball player, the scholar decided to conduct a study the effect of Resistance Training, a Motivational Training and Combined Training of Resistance and Motivation on the motor variable Explosive power, the psychological variable, the achievement motivation and the Volleyball Serving ability. He selected 60 male volleyball players from his college among the players who had participated in the intercollegiate level and open tournaments. They were volunteers to undergo this study. The scholar divided them into three groups namely Resistance Training Group (RTG), Motivational Training Group (MTG) and Combined Training Group (CTG). All the subjects of the three Experimental Groups were tested for their levels of Explosive power and the readings were noted down in centimetres. To measure Leg Explosive power, the following test was used and the performance was recorded in centimetres.

Standing Broad Jump - A test of dynamic power of the legs

The subject must stand in one spot, and use his muscles to jump really far without any kind of lead-in. This test requires concentration and focus. The distance jumped from the base line on the mat to the heel of the landing was measured as the performance. Three trials were given to the subjects and the best of the three trials were noted as the score of Leg Explosive power in centimetres. Fig.1 Shows how Standing Broad Jump is done [3].



Fig.1 Standing Broad Jump Test

Then the scholar gave the following Volleyball Serving skill Questionnaire to 4 volleyball coaches to assess the ability and standard of each subject to serve into a volleyball court. Each coach evaluated with the help of the questionnaire all the subjects and their responses were collected and recorded. Every subject was assessed by each coach for 25 marks and the total of all four coaches for 100 was the score of the subject.

Volleyball Serving Skills Test

Serving Criteria: (1) The server must be positioned beyond the end line (2) The server must contact the ball using a contra lateral motion (3) The server must make contact with the volleyball using an open hand/heel (4) The server must serve over the net to the proper service court.

The server must contact the ball using a single hit

Table 1 Volleyball Serving skill Questionnaire

	The server demonstrated improper serving technique and poor accuracy.	The server lacked 2 or more components of technique but was able to land the ball into the proper service court.	The server demonstrated proper serving technique but the ball went into or under the net.	The server demonstrated proper serving technique but the ball fell outside of the proper service court.	Successful serve into the proper service court using the proper contralateral motion to execute the serve.
Attempt #1	1	2	3	4	5
Attempt #2	1	2	3	4	5
Attempt #3	1	2	3	4	5
Attempt #4	1	2	3	4	5
Attempt #5	1	2	3	4	5
Total Score					25

Then the scholar gave the Achievement Motivation Questionnaire [5] to all the subjects and their responses were collected and recorded for a maximum of 22 scores.

Achievement Motivation Scale

Read each statement and answer True or False to indicate if that statement generally describes you.

Table 2 Achievement Motivation Questionnaire

1. People who work so hard they make the rest of us look bad really bother me.	True <input checked="" type="checkbox"/>	False <input type="checkbox"/>
2. I like taking risks.	True <input type="checkbox"/>	False <input type="checkbox"/>
3. I ask others for advice even if I think I know the answer, because it is always better to be safe than sorry.	True <input type="checkbox"/>	False <input type="checkbox"/>
4. I like it when people say in front of others that I am doing a good job.	True <input type="checkbox"/>	False <input type="checkbox"/>
5. I dislike entering a room full of strangers and trying to connect.	True <input type="checkbox"/>	False <input type="checkbox"/>
6. If you met me, you would say that I get on well with other people.	True <input type="checkbox"/>	False <input type="checkbox"/>
7. I would be more successful, but others try to disrupt my plans.	True <input type="checkbox"/>	False <input type="checkbox"/>
8. In a tight situation, I like it when I am in charge and the blame or praise will come to me.	True <input type="checkbox"/>	False <input type="checkbox"/>
9. I enjoy spending much of my time alone.	True <input type="checkbox"/>	False <input type="checkbox"/>
10. I like being independent.	True <input type="checkbox"/>	False <input type="checkbox"/>
11. In fantasies about my career, often I am in a group and they are praising me.	True <input type="checkbox"/>	False <input type="checkbox"/>
12. Life would be better if more people stuck to their business so I could stick to mine.	True <input type="checkbox"/>	False <input type="checkbox"/>
13. I am basically a competitive person, and I compete just for the sake of competing.	True <input type="checkbox"/>	False <input type="checkbox"/>
14. People do not like to admit it, but success in life has less to do with hard work and more to do with luck and being in the right place at the right time.	True <input type="checkbox"/>	False <input type="checkbox"/>
15. Having good friends is important, but I could quickly make new ones if I had to.	True <input type="checkbox"/>	False <input type="checkbox"/>
16. When it is possible to avoid conflict, I do so.	True <input type="checkbox"/>	False <input type="checkbox"/>
17. Most people who know me say I am ambitious.	True <input type="checkbox"/>	False <input type="checkbox"/>
18. If jobs and money are on the line, it is a good idea to let someone else be in charge, in case things go sour.	True <input checked="" type="checkbox"/>	False <input type="checkbox"/>

19. If I knew others disapproved of my actions, it would cause me to rethink my plans.	True <input type="checkbox"/>	False <input type="checkbox"/>
20. Being part of a team at work is less important than doing good work on your own.	True <input type="checkbox"/>	False <input type="checkbox"/>
21. I regularly list my goals where I can see them during the day.	True <input type="checkbox"/>	False <input type="checkbox"/>
22. Most evenings, I kick back and relax rather than prepare for the next day's tasks.	True <input type="checkbox"/>	False <input type="checkbox"/>

Interpretation*

- 22-20: High need for achievement.
- 19-17: Moderate need for achievement.
- 16-10: Average need for achievement.
- 9-6: Moderately low need for achievement.
- < 5: Low need for achievement.

After collecting all the initial performance of all the three groups, The RTG was given the seven exercises explained in the routine below for about 45 minutes a day for 5 days a week just before their daily volleyball training. The subjects performed each exercises 10 times thrice after rest in between.

- **Bench Press**

Lie on a flat bench with your feet flat on the floor, keep your back flat on the bench. Grasp the bar a little wider than shoulder width apart. Raise the barbell above your body and move it over the middle of your chest, this is your starting position. Lower the bar down so it just touches your chest. Raise the bar till your arms are fully extended and your elbows are locked. Return to starting position.

- **Push Ups**

Start with a basic push up, lay face down on the floor, or a mat; with your feet together curled slightly so you rise onto the ball of your feet. Place your hands shoulder width apart on the either side of your chest. Draw your abs in. Inhale as you raise your body up till your arms are straight. Keep your head and neck level with your body (don't look up or down) and don't allow your back to rise or fall. Exhale out as you lower your body back to the ground. Repeat.

- **Seated Military Press**

Sit on the bench with your toes pointing straight out, back straight and abs drawn in. Grip the bar with your palms facing outwards and your hands shoulder width apart. With bar in front of your head, press upwards extending your arms but not locking them. Pause at the top and then in a controlled movement lower the bar to the starting position.

- **Chin-ups**

Grasp the bar with a supinated (overhand) grip. Let your body hang from the bar with your arms straight. Slowly pull yourself up so that your chin is higher than the bar. With a controlled movement lower yourself to the starting position.

- **Barbell Squat**

Lifting a barbell off of a weight rack, position it on your shoulders. Place your feet slightly wider than shoulder width apart with your knees and toes pointed slightly outward. Drawing your abs in descend slowly by bending at the knees and hips as if you are sitting down (squatting). Lower yourself as far as you can control without letting your body shift towards your toes (this will cause you to lose balance). Pause in the downward position and slowly return upright to the starting position.

- **Flat Bench Leg Raises**

Lie on a flat bench with your hands under your hips supporting your back. Your legs should be unsupported by the bench from below your knees. With your feet together and your toes flexed upwards, raise your straight legs up a few cm off the bench; both of your legs should have no contact with the bench. This is your starting position. Keep your legs straight with a slight bend in the knees and raise your legs to just before 90 degrees with your hips. Pause at the top and lower your legs in slow controlled manner back to the starting position. Repeat

- **Barbell Front Raise and Pullover**

Lie on a flat bench and grasp a barbell using a medium grip (about 15" apart). Place the barbell on your upper thighs and lock your arms straight with a slight bend in your elbows. Draw your abs in and keeping your back flat on the bench, raise your arms up in an arc over and behind your head (as if you were performing a reverse pullover) Slowly return the barbell to the starting position on your thighs.

Resistance training is any exercise that causes the muscles to contract against an external resistance with the expectation of increases in strength, tone, mass, and/or endurance [2]. The external resistance can be dumbbells, rubber exercise tubing, your own body weight, bricks, bottles of water, or any other object that causes the muscles to contract. Resistance training works by causing microscopic damage or tears to the muscle cells, which in turn are quickly repaired by the body to help the muscles regenerate and grow stronger. The breakdown of the muscle fiber is called "catabolism," and the repair and re-growth of the muscle tissue is called "anabolism."

Table 1: ANCOVA Summary for Explosive Power

Source	SS	df	MS	F	P
Adjusted means	152.2	2	76.09	26.82	<.0001
Adjusted error	158.9	56	2.84		
Adjusted total	311.1	58			

Table 2: Ordered Adjusted Explosive Power Means and Differences between Means of Experimental Groups

Combined Group (C)	Motivational Training Group (B)	Resistance Training Group (A)	Mean Difference	Scheffe's Post – hoc F - Ratio
17.8		13.8	4.0	56.14
17.8	15.8		2.0	14.04
	15.8	13.8	2.0	14.04

The MTG was assembled in a hall with audio and video facility. They were shown best volleyball matches, in the video; some recorded interviews from best players and the scholar gave them some motivating and pepping talks about the importance of serving in the game of volleyball for about 45 minutes daily for 5 days in a week just before their evening routine of volleyball practice. Experts and best players from outside were also invited for the motivational talk and to describe their success story.

The CTG was given Resistance Training for 3 days along with RTG and the Motivational Training for 2 days along with the MTG. After a period of 6 weeks, the final data were collected from all the three groups on Explosive power, Achievement Motivation and the Volleyball serving test. They were recorded as the Post Test Scores. The Pre and Post test Scores were analysed by using ANCOVA and Scheffe's post-hoc test [9]and the results are presented below:

RESULTS AND DISCUSSION

The data thus collected before the experimental administration of the programmes were recorded as Pre Test scores. After the experimental period of 6 weeks the measurements were made and recorded as the Pot-Test Scores. All the subjects were playing and training in volleyball like other days and no special training on any technique were given to them. ANCOVA was applied on the performance of Resistance Training Group, Motivational Training Group and the Combined Training Group for ascertaining the significant independent variable Explosive Power among the three groups and the obtained results have been presented in Table 1 and Table 2.

Table 1 show that the Explosive Power is significant at.01 level of confidence. Table 2 shows the differences between adjusted Explosive Power means of Combined Training Group has significantly higher mean than the means of Resistance Training Group and the Motivational Training Group at.01 levels while applying Scheffe's test. The difference between the means of Motivational Training Group and the Resistance Training Group are coincidentally of equal significance. It is inferred that the Combined Training Group had improved the Explosive Power than the other two Groups.

ANCOVA was applied on the performance of Resistance Training Group, Motivational Training Group and the Combined Training Group for ascertaining the

significance of independent variable Achievement Motivation among the three groups and the obtained results have been presented in Table 3 and Table 4.

Table 3 shows that the Achievement Motivation is significant at 0.01 level of confidence. Table 4 shows the differences between adjusted Achievement Motivation means of Resistance Training Group has significantly higher mean than the means of Combined Training Group and the Motivational Training Group at 0.01 levels while applying Scheffe's test. The difference between the means of Motivational Training Group and the Combined Training Group are not significant at 0.01 level of confidence. It is inferred that the Resistance Training Group had improved the Achievement Motivation than the other two Groups.

ANCOVA was applied on the performance of Resistance Training Group, Motivational Training Group and the Combined Training Group for ascertaining the significance of independent variable Achievement Motivation among the three groups and the obtained results have been presented in Table 3 and Table 4.

Table 5 shows that the Service Test is significant at 0.01 level of confidence. Table 4 shows the differences between adjusted Service Test means of Combined Training Group has lower mean than the means of Motivational Training Group and the Resistance Training Group at 0.01 level while applying Scheffe's Test. The difference between the means of Motivational Training Group and the Resistance Training Group are significant at 0.01 level of confidence. It is inferred that the Motivational Training Group was better than the Resistance Training Group in Service Test.

Table 3: ANCOVA Summary for Achievement Motivation

Source	SS	df	MS	F	P
Adjusted means	8.11	2	4.06	3.17	0.05
Adjusted error	71.61	56	1.28		
Adjusted total	79.72	58			

Table 4: Ordered Adjusted Achievement Motivation Means and Differences between Means of Experimental Groups

Resistance Training Group (A)	Combined Training Group (C)	Motivational Training Group (B)	Mean Difference	Scheffe's Post - hoc F - Ratio
21.35		20.4	0.95	6.84
	21.0	20.4	0.6	2.73
21.35	21.0		0.35	0.92

Table 5: ANCOVA Summary for service Test

Source	SS	Df	MS	F	P
Adjusted means	184.7	2	92.33	7.27	0.002
Adjusted error	710.8	56	12.69		
Adjusted total	895.5	58			

Table 6: Ordered Adjusted Service Test Means and Differences between Means of Experimental Groups

Combined Group (C)	Motivational Training Group (B)	Resistance Training Group (A)	Mean Difference	Scheffe's Post – hoc F - Ratio
81.14	79.89		1.25	1.231
	79.89	76.47	3.42	9.22
81.14		76.47	4.67	17.19

CONCLUSION

The difference between the means of Motivational Training Group and the Resistance Training Group are coincidentally of equal significance. It is inferred that the Combined Training Group had improved the Explosive Power than the other two Groups. The difference between the means of Motivational Training Group and the Combined Training Group are not significant at 0.01 level of confidence. It is inferred that the Resistance Training Group had improved the Achievement Motivation than the other two Groups. The difference between the means of Motivational Training Group and the Resistance Training Group are significant at 0.01 level of confidence. It is inferred that the Motivational Training Group was better than the Resistance Training Group in Service Test. Based on the obtained results it was concluded that Combined Training Group (CTG) has the highest potential for improving the explosive power and volleyball serving ability. Resistance Training Group (RTG) contrary to the expectation added excellently enhanced the Achievement Motivation. Motivation Training has helped the players to achieve the necessary motor fitness and serving ability in general.

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