CHAPTER V
SUMMARY, CONCLUSION AND RECOMMENDATIONS

SUMMARY

Volleyball is a sport played by two teams on a playing court divided by a net. There are different versions available for specific circumstances in order to offer the versatility of the game to everyone. The object of the game is to send the ball over the net in order to ground it on the opponent’s court, and to prevent the same effort by the opponent. The team has three hits for returning the ball (in addition to the block contact). The ball is put in play with a service: hit by the server over the net to the opponents. The rally continues until the ball is grounded on the playing court, goes “out” or a team fails to return it properly. In Volleyball, the team winning a rally scores a point (Rally Point System). When the receiving team wins a rally, it gains a point and the right to serve, and its players rotate one position clockwise.

Volleyball is one of the most successful, popular, competitive and recreational sports in the world. It is fast, exciting and the actions are explosive. Yet volleyball comprises several crucial overlapping elements whose complimentary interactions render it unique amongst rally games. Competition taps latent strengths. It exhibits the best of ability, spirit, creativity and aesthetics. With a few exceptions, volleyball allows all players to operate both at the net in attack and block and in the back court to defend or serve.

The height of action above net is another deciding factor for victory in modern top volleyball. Therefore the teams to establish their superiority in spiking and blocking above the net is continuously striving to improve upon the height of players, good jumping ability and perfect skills for spiking, blocking and serving. However, it is pertinent to consider that the body height must be combined with the jumping ability and par excellence in skills. The tallest team has an added advantage but it is very rare that a team better in average height than other ranking teams wins. The reach of the player is the result of the height and jumping ability, thereby considering the average height of the
players was far below than the reach presently achieved by the players, which shows that there is a tremendous increase in the jumping reach of players. It was recorded 3.30 to 3.40 meters in men about 20 years back, whereas the recent jump reach is 3.70 meters and above in men. Still victory goes to those who train their teams well by the way of improving the jumping ability, perfection of skills and other coordinative abilities. It is also generally noticed that the players are not considered only in term of height but at the same time, the weight is also equally important to build up the strength. The statistics on weight and height clearly reveals that in modern volleyball the weight is also given due significance. The heaviest player in Sydney Olympic was 120 kg (George Roman, USA) in men.

Preponderance of scientific evidence obtained from different investigations has revealed that high level of performance depends upon various factors like somatic, physiological, anthropometrics, psychological factors etc. Hence, there is a need to pay attention upon these factors, which are main predictors of sports performance. Countries leading in sports, such as America, Russia, Germany, China etc are using well developed scientific system of training for their players and teams over a period of several years but India is in cross roads. Though it has developed and improved to considerable extent yet much is desired to be achieved.

Statement of the problem

The purpose of the study was to analyze selected anthropometrical, motor fitness, motor skills and competition experience variables to evaluate the volleyball playing performance of 14 to 19 years Sports Authority of India training centers male volleyball players. Therefore the problem has been stated as “Analysis of selected factors associated with playing performance in male volleyball players of SAI training centres”.

Aims and objectives of the study
1. To find out the relationship between selected anthropometrical variables with the volleyball playing performance.
2. To find out the relationship between selected motor fitness variables with the volleyball playing performance.
3. To find out the relationship between selected motor skill variables with the volleyball playing performance.
4. To find out the relationship between competition experience variable with the volleyball playing performance.
5. To find out the relationship among selected anthropometric, motor fitness, motor skill and competition experience variables.
6. To find out the contribution of selected anthropometrical variables to the volleyball playing performance.
7. To find out the contribution of selected motor fitness variables to the volleyball playing performance.
8. To find out the contribution of selected motor skill variables to the volleyball playing performance.
9. To find out the contribution of competition experience variable to the volleyball playing performance.
10. To find out the combined contribution of anthropometrical, motor fitness, motor skills and competition experience variables to the volleyball playing performance.
11. To find out most versatile variables of anthropometrical, motor fitness and motor skill variables which could evaluate the performance of male volleyball players.
12. To draw out the regression equation to predict their performance.

**Hypothesis**

1. There would be significant relationship between selected anthropometrical variables with the volleyball playing performance.

2. There would be significant relationship between selected motor fitness variables with the volleyball playing performance.

3. There would be significant relationship between selected motor skill variables with the volleyball playing performance.
4. There would be significant relationship between competition experience variable with the volleyball playing performance.

5. There would be significant relationship among selected anthropometric, motor fitness, motor skills and competition experience variables.

6. There would be significant contribution of selected anthropometrical variables to the volleyball playing performance.

7. There would be significant contribution of selected motor fitness variables to the volleyball playing performance.

8. There would be significant contribution of selected motor skill variables to the volleyball playing performance.

9. There would be significant contribution of competition experience variable to the volleyball playing performance.

10. There would be significant combined contribution of anthropometrical, motor fitness, motor skills and competition experience variables to the volleyball playing performance.

11. Most versatile variable of anthropometrical, motor fitness, motor skill and competition experience variables will come out for evaluating the performance of male volleyball players.

12. A meaningful equation of anthropometrical, motor fitness, motor skill and competition experience variables will emerge to predict the performance of male volleyball player.

**SELECTION OF SUBJECTS**

Sports Authority of India training centers players from Haryana, Punjab, Himachal Pradesh, Rajasthan and Gujarat were selected as subjects for the study. 102 players between the age group of 14 to 19 years were tested. Those who participate at state level and above competitions were considered for the study. Necessary documents were verified from the office of the respective training center related to their age and medical fitness. It was found that all subjects were medically fit for going through the testing procedure.
SELECTION OF ANTHROPOMETRICAL, MOTOR FITNESS, MOTOR SKILL AND COMPETITION EXPERIENCE VARIABLES

The anthropometrical, motor fitness, motor skill and competition experience variables that influence the performance in the game of volleyball were selected with greater care on the basis of personal experience of the research, long discussion with the coaches, and critical analysis of the related literature with joint consideration of the feasibility of the tests, availability of the equipments and acceptability of the subjects. After having taken care of the above criteria into consideration the following anthropometrical, motor fitness, motor skill and competition experience variables were considered for the study.

I. Independent Variables.

A Anthropometrical variables

1. Age
2. Body Height
3. Body Weight
4. Standing reach
5. Sitting Height
6. Biacromion Width
7. Humerus bicondylar diameter
8. Femur bicondylar diameter
9. Ankle diameter
10. Hand Span
11. Arm span
12. Arm length
13. Leg Length
14. Head circumference
15. Chest circumference
16. Waist circumference
17. Gluteal circumference
18. Thigh circumference  
19. Calf circumference  
20. Ankle circumference  
21. Arm circumference relaxed  
22. Forearm circumference  
23. Wrist Circumference  
24. Sub scapular skin fold  
25. Bicep Skin fold  
26. Triceps skin fold  
27. Fore arm skin fold  
28. Supra iliac skin fold  
29. Thigh skin fold  
30. Calf Skin fold  

B. Motor fitness Variables  

31. Speed  
32. Agility  
33. Leg power  
34. Shoulder power  
35. Trunk flexibility (forward)  
36. Trunk flexibility (backward)  
37. Endurance  

C. Motor skill variables  

38. General volley pass playing ability.  
40. Passing skill.  
41. Set up ability.  

D. Competition experience  

42. Competition experience
II  Dependent Variables

Overall volleyball playing performance: Over all playing performance was analyzed through statistical match analysis (SMA). Four point rating scale was used to evaluate the playing performance.

Statistical Analysis

The relationship between dependent variable (Volleyball playing performance) and independent variables (Anthropometrical, Motor fitness, motor skill and competition experience) was established through computing Pearson's Product Moment Coefficient Correlation statistical technique was used. The combine contributions of anthropometrical, motor fitness and motor skill variables to volleyball playing performance were obtained through multiple correlations. Most versatile anthropometrical, motor fitness, motor skill and competition experience variables as predictor to the volleyball playing performance were obtain through multiple step-wise regressions. Regression equations was formed on the basis of predicted anthropometrical, motor fitness, motor skill and competition experience variables as well as regression equations for combined contribution of anthropometrical, motor fitness, motor skill and competition experience variables to predict the volleyball playing performances was also formed.

CONCLUSIONS

Within the constraints and limitations of this study, the conclusions deducted are as follows:

RESULTS RELATED TO SELECTED ANTHROPOMETRICAL VARIABLES OF MALE VOLLEYBALL PLAYERS

Out of 30 anthropometrical variables 14 variables namely weight, height, standing reach, sitting height, arm span, arm length, leg length, head circumference, chest circumference, waist circumference, gluteal circumference, wrist circumference, thigh skin fold and calf skin fold were found to be significantly related to the playing performance of male volleyball players. Whereas shoulder width, humerus diameter,
femur diameter, ankle diameter, hand span, thigh circumference, calf circumference, ankle circumference, arm circumference, fore arm circumference, sub scapular skin fold, biceps skin fold, triceps skin fold, fore arm skin fold and supra iliac skin fold were not significantly related to the playing performance of male volleyball players. However the regression analysis reveals that calf skin fold and weight are the best predictors of playing performance in male volleyball players. The final equation came to be as under:

Playing performance = 33.115 +0.493(weight) -1.996(calf skin fold)

RESULTS RELATED TO SELECTED MOTOR FITNESS VARIABLES OF MALE VOLLEYBALL PLAYERS

The motor fitness variables namely 20 meter dash, semo agility, sargent jump and basketball throw were found to be significantly related to the playing performance of male volleyball players. These four variables are significance at 1% level. Whereas sit and reach, bridge up and 1500 meters run were not significantly related to the playing performance of male volleyball players. However the regression analysis reveals that sargent jump and basketball throw are the best predictors of playing performance in male volleyball players. The final equation came to be as under:

Playing performance = -13.683 + 0.828 (sergeant jump) + .743 (basketball throw)

RESULTS RELATED TO SELECTED MOTOR SKILLS VARIABLES OF MALE VOLLEYBALL PLAYERS

All motor skill variables namely Brady’s wall volleying test, AAHPER serving test, AAHPER passing test and AAHPER set up test were found to be significantly related to the playing performance of male volleyball players. These four variables are significance at 1% level. However the regression analysis reveals that serving skill and set up ability are the best predictors of playing performance in male volleyball players. The final equation came to be as under:

Playing performance = 21.868 + 0.814 (AAHPER serving test) + 1.553 (AAHPER set up test)
RESULTS RELATED TO COMPETITION EXPERIENCE VARIABLE OF MALE VOLLEYBALL PLAYERS

Results presented in table no 24 reveals that competition experience variable was found to be significant with playing performance of male volleyball players. The r value .539 indicates that competition experience is significance at 1% level of confidence. Competition experience alone explains 28.3% variance in playing performance thus a powerful predictor. To predict the playing performance of male volleyball players based on competition experience variable is as under:

Playing performance = 46.408 + 0.694 (competition experience)

RESULT RELATED TO RELATIONSHIP AMONG INDEPENDENT VARIABLES OF MALE VOLLEYBALL PLAYERS

Out of 30 anthropometrical variables 22 variables was found partially significant relationship with motor fitness variables, where as 8 anthropometrical variables found none significant relationship with motor fitness variables. 8 variables show significant relationship with 20 meter dash, 6 variables shows significant relationship with semo agility test, 11 variables shows significant relationship with sargent jump, 4 variables shows significant relationship with basketball throw, 3 variables shows significant relationship with sit & reach test, 6 variables shows significant relationship with bridge up test and 11 variables shows significant relationship with 1500 meters run.

Out of 30 anthropometrical variables 19 variables was found partially significant relationship with motor skill variables, where as 11 anthropometrical variables found none significant relationship with motor skill variables. 18 anthropometrical variables shows significant relationship with Brady’s wall volleying test, AAHPER serving test was found significantly related with 5 anthropometrical variables, AAHPER passing test was found significantly related with 2 anthropometrical variables where as AAHPER set up test was found significantly related to only 1 anthropometrical variable.

Out of 30 anthropometrical variables 11 variables was found significant relationship with competition experience variable.
Out of 7 motor fitness variables 4 variables was found partial significant relationship with motor skill variables. 20 meter dash test was found significantly related to set up ability, Sargent jump test was found significantly related with 3 motor skill variables, Basketball throw test was found significantly related with 2 motor skill variables, Sit & reach test was found significantly related with 2 motor skill variables where as Bridge up and 1500 meters run were not found significantly related with any of the motor skill variables.

Out of 7 motor fitness variables only 1500 meters run was found significant relationship with competition experience variable. None of the four motor skill variables shows significant relationship with competition experience variable.

RESULTS RELATED TO COMBINED CONTRIBUTION OF SELECTED ANTHROPOMETRICAL, MOTOR FITNESS, MOTOR SKILL AND COMPETITION EXPERIENCE VARIABLES OF MALE VOLLEYBALL PLAYERS

When regression analysis was done to find out combined contribution of selected anthropometrical, motor fitness, motor skill and competition experience variables of male volleyball players to the playing performance, nine models had come out, the R square value of ninth model is .687 and highest among all models thus best to predict the playing performance of male volleyball players. Constant for model no 9 is -46.086 and has seven predictors which are sargent jump having regression coefficient (B) value .399, calf skin fold regression coefficient (B) value -1.235, arm span regression coefficient (B) value .094, basketball throw regression coefficient (B) value .959, set up ability regression coefficient (B) value 1.036, competition experience regression coefficient (B) value .254 and standing reach regression coefficient (B) value .133. The P value of sargent jump, calf skin fold, arm span, basketball throw, set up ability and competition experience variables in model 9 in table no 35 is less than .01 so these variables are significant at 1%, where as P value of standing reach is .033 thus significant at 5% level of confidence. Equation to predict the playing performance is as under: -
Playing performance = \(-46.086 + 0.133 \text{ (standing reach)} + 0.094 \text{ (arm span)} – 1.235 \text{ (calf skin fold)} + 0.399 \text{ (sargent jump)} + 0.959 \text{ (basketball throw)} + 1.036 \text{ (set up ability)} + 0.254 \text{ (competition experience)}\)

**RECOMMENDATIONS**

1. Coaches and trainers are advised to use the anthropometric, motor fitness, motor skill and competition experience variables equation mentioned in the results to select sports authority of India training centre’s male volleyball players.

2. Coaches and trainers may develop scientific and systematic training program on the basis of talent identification through anthropometrical findings and more emphasis on the tuning of motor fitness and motor skill variables identified as performance predictor to the volleyball playing performance in the present study.

3. Leg power is one of the most dominating factors in male volleyball playing performance; more stress should be given to develop leg power.

4. In predicting playing performance the following prediction equation may be used for men volleyball players:

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\text{Playing performance} = -46.086 + 0.133 \text{ (standing reach)} + 0.094 \text{ (arm span)} – 1.235 \text{ (calf skin fold)} + 0.399 \text{ (sargent jump)} + 0.959 \text{ (basketball throw)} + 1.036 \text{ (set up ability)} + 0.254 \text{ (competition experience)}.
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5. Similar study may also be conducted for other sports/discipline.

6. The similar study may be conducted on different performance level.

7. A similar study may be conducted utilizing the functional components in addition to the components chosen in this study.

8. A longitudinal study may be conducted employing players of different ages and performance levels to determine factors that may be used for spotting talent and may not be modified with training and those factors that may predict performance but may otherwise be modifiable as the player’s training experience increases.