Chapter V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

Fitness is an essential ingredient of the successful performance in sports, no matter at what level it is displayed. It is a known fact that the physical fitness of an individual plays a decisive role in winning or loosing a sport competition because the teams generally are equally matched in techniques and tactics of a game at a particular level of any tournament.

Besides physical fitness, which is generally in nature, few researchers have advocated the doctrine of 'specificity,' which indicates that the training of different sportsmen shall be different because of specific demands of a sport. They are of the opinion that instead of measuring physical fitness, it is more appropriate to measure the specificity than the physical fitness, as it plays an important role with regard to a particular sport.
Further Henson\(^1\) opined that training is affected by the specificity; so it must be specific to the requirements of the event. For it the requirement of a sportsman is power which he must develop and so on. Morehouse and Miller\(^2\) contended, if the training is directed to the development of either strength or speed, naturally the results are unilateral adaptation, but the degree of adaptation is higher than the result from all-round training. Gardner\(^3\) proved that strength increases quite specifically according to the position/angle at which the limb is exercised. Some people maintain that specificity extends even to the speed at which the weight is moved. They advocate that if sports call for fast movement, the training exercise must also be fast.

\(^1\)Henson, *Athletic Asia* 16 (March 1987):3.

\(^2\)Morehouse and Miller, *Physiology of Exercise*, p.257-262.

Jones has stated that the training may be utterly specific or not at all but the scientific and systematic training leads to the specificity of training. The only possible way to produce specificity in any sport is by performing that sport itself. In fact, the possible training for volleyball is to play the volleyball itself. The only possible way to obtain specificity is by performing the act itself, with the same tool, in exactly the same manner.

Fitness testing has been traditional for valid reasons and there is a high degree of specificity associated with testing and training of an individual. The valid reasons for testing fitness require an identification of the purpose of testing and selection of specific tests, which can meet the goals of test items and yield the desired results.

It is easy to evaluate the general physical fitness of volleyball players. However, the difficulty arises in evaluating the specific physical fitness of a player in relation to a game and particularly in preparing the training programme for

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higher level competition. Keeping in view the specificity in testing the primary purpose of the study was to develop a specific fitness test for evaluating the physical fitness of volleyball players. The secondary purpose of the study was to prepare norms for 14 year to 18 year of age group.

The present study was conducted in two phases. In the first phase, specific fitness test items were constructed and in the second phase, the norms for test items for specific physical fitness were developed for different age categories.

First Phase of the Study

After reviewing the literature with the consent of the experts, it was considered important to know which physical fitness components were essential for a volleyball player. For this purpose, a questionnaire was prepared and sent to the experts for their opinion regarding the importance of each component of physical fitness for volleyball players. Those components, which were rated 50 per cent and above were considered suitable for measuring the specific fitness of a player. The retained components were muscular power, agility, speed endurance, muscular endurance and flexibility.
Besides this the growth factor was considered for the development of norms.

On the basis of retained fitness components, as many as 30 functional test items were ascertained after examining related literature and consulting the experts in the field of volleyball. Again a questionnaire was prepared and sent to the experts to evaluate the tests on five point rating scale on the basis of functional characteristics of a test. The 26 test items (20 mts. run, 50 mts. run, speed of movement test, spike jump, block jump, vertical jump, softball throw, basketball throw, push up, sit up, burpee, wrist flexion, wrist hyper extension, trunk flexion, trunk hyper extension, squat thrust, up and down run, court agility, W.M. agility, six point run, W.M. run, one minute lateral jump, Age, weight, height and standing reach height) having 50 per cent and above weightage were retained to administer on the samples for the development of specific fitness tests. A random sampling method was used to collect the data on 150 volleyball players. The players were in the 14 - 18 year age group and belonged to Punjab, Haryana, Delhi, Chandigarh and Himachal Pradesh.
The data was analysed using Pearson's product moment correlation (r) for assessing the relationship of criterion with each of the test items of specific physical fitness test. The analysis of the data disclosed significant relationship between independent variables and the criterion. The correlation of spike jump (r = .56), W.M. run (r =-.46), squat thrust (r = .41), basketball throw (r = .54) and wrist flexion (r = .41) was found with the criterion.

The multiple correlation (wherry-do-little method) was used to know the combined contribution of all the test terms to volleyball performance. The result of the study shows that spike jump (explosive power), W.M. run (endurance), squat thrust (agility), basketball throw (power of the arm), and wrist flexion (flexibility) contribute much to playing ability (c) $R_c^2 4, 21, 16, 8, 12 = .95$ among physical fitness tests.

The multiple-regression equation was worked out to assess the relative contribution of different factors to specific physical fitness of volleyball players.

The multiple regression analysis resulted in the following equations:
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\begin{align*}
Z_c &= 0.536 Z_4 - 0.383 Z_{21} + 0.358 Z_{16} + 0.322 Z_8 + 0.266 Z_{12} \\
Z &= \text{Proposed specific physical fitness test scores.}
\end{align*}
\]

\[Z_4 = \text{Spike Jump}\]
\[Z_{21} = \text{W.M. Run}\]
\[Z_{16} = \text{Squat Thrust}\]
\[Z_8 = \text{Basketball Throw}\]
\[Z_{12} = \text{Wrist Flexion.}\]

The result reveals that the specific fitness of a volleyball player depends upon the spike jump (leg power) to a greater degree, followed by W.M. Run (Endurance), Squat thrust (Agility) Basketball Throw (Arm Power) and Wrist flexion (Flexibility), in a diminishing order.

For assessing the scientific authenticity of the test items, validity was computed by relating the performance of volleyball players to each of the test items and their playing ability. The resulting coefficients were Spike jump \((r = .85)\), W.M. Run \((r = .79)\), Squat thrust \((r = .73)\), Basketball throw \((r = .81)\) and Wrist flexion \((r = .63)\) which were significant at .05 level of confidence. Besides this, the composite
score of selected test items was correlated with the playing ability of the volleyball players and the value obtained was .84.

Further the differential validity was found out, when the scores of volleyball and non-volleyball players were compared with each test item separately and the 't' values found were Spike jump (t = 4.64), W.M. Run (t = 3.32), Squat thrust (t = 4.70), Basketball throw (t = 4.15) and Wrist flexion (t = 4.82). All these values were significant at .05 level of confidence.

The reliability and objectivity of each test item were computed and the values obtained were significant at .05 level of confidence. The variability and objectivity co-efficients ranged from .80 to .95 and .78 to .92 respectively.

In order to find out, whether the groups were different or not with regard to their performance in each of the selected test items, 'F' ratio was computed and enlisted in this order Spike jump (F = 28.32), W.M. Run (F = 39.36), Squat Thrust (F = 18.87), Basketball Throw (F = 30.31) and Wrist flexion (F = 16.70). The 'F' values show that the
performance of each group, in each test varies significantly.

The Second Phase of the Study

Development of Norms

For the compilation of norms, the tests were administered on 500 volleyball players of Punjab, Haryana, Delhi, Chandigarh and Himachal Pradesh. The data was arranged age-wise so as to calculate the Mean and Standard deviation. The Percentile and Hull Scale were constructed and norms for the 14 - 18 year age group were developed.

Conclusions

Within the limits and limitations of the present study, the following conclusions are enumerated:

1. The Multiple correlation yielded five specific Physical Fitness Tests.

2. The battery of tests developed by the researcher has the ability to predict the specific fitness of volleyball players.

3. All the five tests (Spike jump, W.M. run, Squat thrust, Basketball throw and Wrist flexion)
showed highly significant relationship with the volleyball playing ability.

4. The relationship between composite score of all the test items and the playing ability was also significant.

5. The newly developed fitness tests meet the criterion of scientific authenticity i.e. the test items are reliable, objective and valid.

6. The leg power, endurance, agility, arm power and wrist flexion are deemed to be meaningful in representing the specific physical fitness of the volleyball players.

**Recommendations**

In the light of the conclusions drawn, the following recommendations are made:

1. The coaches can develop specific conditioning programmes for the volleyball players in accordance with the findings of this study.

2. The volleyball coaches may use the specific fitness test periodically to evaluate the effectiveness of their conditioning programme and the progress made by the players.
3. A similar study may be taken up by involving both sexes of the volleyball players at different levels.

4. Similar studies can be conducted in other sports also.

5. A similar study may be conducted by involving psychological and sociological variables for different age groups and for both sexes.

6. The results of the study can be used by coaches as an aid to screening and selection of the players.

7. The study may help to overcome the bias of the skill performance.