Chapter-V
Summary, Conclusion And Recommendations
CHAPTER-V

SUMMARY, CONCLUSION AND RECOMMENDATIONS

In this chapter, the summary of the previous chapter, introduction, review of literature, methodology and discussion are included. The conclusions drawn on the basis of the results obtained and the recommendations for further research have also been included:

SUMMARY

Sports performance is a multidimensional product of athlete’s capacities and their interaction with athletic environment. Being multidimensional it suggests that a variety of factors are involved in actually attaining performance goals.

Although successful athletes generally have typical performance characteristics, the pattern of these performance characteristics vary: from athlete to athlete. When an athlete is low in some such trait or traits, he compensates by another.

But among all performance factors, physical fitness development is prerequisite for all the athletes. However, importance of various components of fitness varies with different sports. Harre (1979) said, for a high level of performance physical fitness is most important and fundamental criteria.

Keeping in view of the significant contribution of kinanthropometric and physical fitness variables in the playing ability of a number of sports. An attempt was made to identify the important kinanthropometric and physical fitness variables to predict the physical ability of male kho-kho players.
OBJECTIVES OF THE STUDY

The objectives of the present study are formulated as under:

1) To determine the relationship between selected kinanthropometric variables and playing ability of male kho-kho players.
2) To determine the relationship between fitness variables and playing ability of male kho-kho players.
3) To determine the multiple correlation of selected kinanthropometric, fitness variables and playing ability of male kho-kho players.
4) To set up the regression equation for the prediction of playing ability on the basis of kinanthropometric and physical fitness variables of kho-kho players.

HYPOTHESES OF THE STUDY

1) There would be a significant relationship between kinanthropometric variables and playing ability of male kho-kho Players.
2) There would be a significant relationship between fitness variables and playing ability of male kho-kho Players.
3) Playing ability of kho-kho players could optimally be predicted on the basis of kinanthropometric and physical fitness variables.

DELIMITATONS OF THE STUDY

1) The present study was based on 120 male kho-kho players which were playing from their respective colleges affiliated to Himachal Pradesh University, Shimla.
2) The study was confined only to male kho-kho players.
3) The study was delimited to the kinanthropometric variables, physical fitness variables and playing ability of kho-kho players.
4) The kinanthropometric variables were measured with the help of Anthropometric Rod, steel tape, Vernier caliper and lange's skinfold caliper.

5) Physical fitness variables were tested pull-ups, bent knee sit-ups in 60 sec., shuttle run 10 x 4 yards, standing broad jump, 50 yards dash, 600 yards run/walk, wrast flexibility and ankle flexibility.

6) The overall playing ability of the subjects was measured with five points rating scale.

7) Body composition was calculated by using skinfold measurements i.e. biceps, triceps, sub scapular and suprailiac skinfolds.

8) For the analysis and interpretation of data, statistical treatment was confirmed to Pearson's product movement correlation (Zero order), multiple correlation and regression equation.

9) Data was collected during morning and evening session.

10) The age of the subjects was between 18 to 25 years.

LIMITATIONS OF THE STUDY

1) The factors like socio-economic condition, diet, rest, daily routine, lifestyle, habits etc. which might effect the result of the study were considered as limitation of the study.

2) The effect of weather condition during collection of data could influence the results and it was accepted as limitation of the study.

3) No special motivational technique was used during the test. Therefore, the difference that might have occurred in performance due to lack of motivation was recognized as the limitation of the study.

SAMPLE:

To accomplish the study, the researcher used random sampling techniques to select the subjects. The subjects were one hundred twenty male inter-college level kho-kho Players, who were studying in various affiliated
colleges and different departments of Himachal Pradesh University, Shimla and these subjects had participated in the Himachal Pradesh University inter-college kho-kho Competition for men which was held at Govt. College Karsog, Mandi Himachal Pradesh respectively in the month of December 2012. The subjects were in the age group of 18 to 25 years.

**SELECTION OF VARIABLES:**

A) **Independent Variables:**
1) Age
2) Body weight

**Linear Measurements**
3) Height
4) Total arm length
5) Fore arm length
6) Leg length
7) Sitting height
8) Lower leg length
9) Foot length

**Skeletal Diameters (Width)**
10) Shoulder diameter (bioromiab)
11) Abdominal diamenter
12) Hip diameter
13) Elbow diameter
14) Femur bicondylar diameter
15) Ankle diameter

**Body Circumferences (girths)**
16) Shoulder circumference
17) Chest circumference (normal)
18) Upper arm circumference
19) Thigh circumference
20) Calf circumference

Skin Fold Measurements

21) Biceps skin fold
22) Triceps skin fold
23) Chest skin fold
24) Sub scapular skin fold
25) Suprailiac skin fold
26) Thigh skin fold
27) Calf skin fold

Body Composition Variables

28) Body density
29) Percentage fat
30) Fat weight
31) Lean body mass

Physical Fitness Components

32) Muscular Strength
33) Muscular Endurance
34) Agility
35) Muscular power
36) Speed
37) Flexibility Wrist Ankle flexibility

B) Dependent Variables

Overall kho-kho playing ability of each player was evaluated by three kho-kho caches/experts on the basis of individuals running and chasing skills and the average score was taken as final score.
TOOLS USED

1. The average score of the three experts was considered to judge kho-kho playing ability.

2. For measuring the height and weight, the anthropometer rods and portable lever actuated weighing machine were used.

3. A flexibility steel tape was used to measure the circumferences.

4. The lange's skinfold caliper was used to measure the different skin fold measurements.

5. Diameters were taken with the help of vernier caliper and anthropometer compass.

6. The components of physical fitness and test items chosen to represent in the AAHPER YOUTH FITNES TEST (1976) were follows.

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Physical Fitness Components</th>
<th>Test Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Muscular Strength</td>
<td>Pull ups</td>
</tr>
<tr>
<td>2.</td>
<td>Muscular Endurance</td>
<td>Bent knee sit ups (in 60 sec.)</td>
</tr>
<tr>
<td>3.</td>
<td>Agility</td>
<td>Shuttle run (10x4 yards)</td>
</tr>
<tr>
<td>4.</td>
<td>Muscular Power</td>
<td>Standing broad jump</td>
</tr>
<tr>
<td>5.</td>
<td>Speed</td>
<td>50 yards dash</td>
</tr>
<tr>
<td>6.</td>
<td>Cardiovascular endurance</td>
<td>600 yards run/walk</td>
</tr>
<tr>
<td>7.</td>
<td>Flexibility</td>
<td>Wrist and Ankle Flexibility</td>
</tr>
</tbody>
</table>

COLLECTION OF DATA

All the body measurements were taken on the right side of the body of the subject.
Linear measurements, body circumferences, diameters and skinfold measurements were measured with the help of anthropometer rod, flexible steel tape, vernier caliper and skinfold caliper respectively.

Body composition variables were calculated using sum of biceps, triceps, subscapular, suprailiac skinfold, body density fat weight and lean body mass were calculated by using Durnin’s and Rehman’s (1967) method and percentage fat was calculate by using Siri’s (1956) formula. Body weight is measured by using portable weighing machine for all subjects. To measure the physical fitness of kho-kho players pull-ups for muscular strength, bent knee sit-ups (in 60 second) for muscular endurance, shuttle run (10 x 4 yards) for agility, standing broad jump for muscular power, 50 yards dash for speed, 600 yards run/walk for cardiovascular endurance, ankle flexibility and wrist flexibility for ankle and wrist joints movement were used.

To collect the data for playing ability, five point rating scale tests for players were utilized.

To achieve the objectives of the present study, the correlation by product moment method and multiple correlation and regression prediction equation by Wherry-Doolittle Methods were utilized.

**ANALYSIS OF DATA**

Person’s product moment coefficient of correlation was used to analyze the data to assess the relationship of overall Kho-Kho playing ability of male players with each of the kinanthropometic and physical fitness variables and multiple step-wise regression technique was used to identify the meaningful kinanthropometric and physical fitness test variables to predict playing ability of male kho-kho players.
CONCLUSIONS

On the basis of the discussion of the results in the 4th chapter, the following conclusions were made.

Results of male kho-kho players in relation to tested kinanthropometric and physical fitness variables.

1. Age and weight have no significant correlation with playing ability of kho-kho players. Hence, no age and weight contributes to playing ability of kho-kho players.

2. Height and total arm length have found positive and significant correlations with the playing performance of kho-kho players. Fore arm length, leg length, sitting height, lower leg length and foot length have no significant correlation with playing ability of kho-kho players.

3. Ankle diameter has found significant and negative correlation with the playing ability of kho-kho players and other variables such as shoulder diameter, hip diameter, elbow diameter and femur bicondylar diameter have no significant correlation with the playing performance of kho-kho players.

4. Shoulder circumference, chest circumference, upper arm circumference, thigh circumference and calf circumference have no significant correlations with the playing performance of kho-kho players.

5. Biceps skin fold has found positive and significant correlation with the playing performance of kho-kho players. Triceps skin fold, chest skin fold, sub scapular skin fold, suprailiac skin fold, thigh skin fold and calf skin fold have no significant correlations with the performance of kho-kho players.

6. Body density, percentage fat, fat weight and lean body mass have no significant correlations with the performance of kho-kho players.

7. Agility and ankle flexibility have found positive and significant correlations whereas speed has found negative and significant correlation with the playing performance of kho-kho players. Muscular
strength, muscular endurance, muscular power, cardiovascular
endurance and wrist flexibility have no significant correlation with
playing ability of kho-kho players.

8. Multiple correlation of various variable i.e. total arm length sitting
height, ankle diameter, agility, speed and ankle flexibility, taken
together had significant correlation with playing ability of kho-kho
players. Multiple correlations is very high and hence the regression
equation developed by this variables could be used for the prediction of
the playing ability.

SUGGESTIONS AND RECOMMENDATIONS

In the light of the findings of the present study, the following recommendations
are made to the coaches, physical educators, sports scientists and players.

1. The results of the study can be used by the coaches, physical education
teachers and trainers as an aid in screening and selecting prospective
kho-kho players.

2. On the basis of results, coaches and trainers might develop their training
program laying more emphasis on the related kinanthropometric and
physical fitness test variables proved to be important for the
performance.

3. It is recommended that the similar study may be conducted by selecting
subjects belonging to different age groups and levels of achievement
other than those employed in the present study.

4. Similar studies may be conducted on various other sports and games.

5. It is recommended that similar study may be conducted on
psychological variables and motor fitness variables.

6. To improve the standard of kho-kho players in India a talent hunt
scheme should be launched specially for the rural area and players
should be selected on the basis of their kinanthropometric and physical
fitness parameters and given training.