Chapter I

INTRODUCTION

During the modern times sport has become a part and parcel of our culture. It is being influenced and does influence all of our social institutions including education, economics, arts, politics, law, mass communication and international diplomacy – its scope is awesome.¹

The world of games and sports is expanding and helping sportmen and coaches, not being satisfied to rest on their laurels and are making their utmost endeavors to put their best foot forward to attain higher and higher standards through training and exercise. In today's techno-scientific age the world is progressing with tremendous speed in all fields of life and it has not even spared games & sports. Scientific knowledge had revolutionized the standards of performance in sports disciplines. Now because the coaches strive to get optimum performance with maximum expenditure of energy and time the players and athletes are trained on scientific guidelines.

An important phase of the physical education profession is applied to testing of an individual's ability to meet the demands of varying types of tasks. An equally important application of testing the programme is made by sports scientists and sports trainers in order to assess physical abilities in terms of one's physical, psychological and physiological limits, so as to provide each sportsperson with individualized and properly guided programme schedules for effective training programmes. Such an effort automatically ensures result oriented training plans.

Physical fitness is the ability to carry out daily tasks with vigor and alertness without undue fatigue and have ample energy to enjoy leisure time pursuits and to meet unforeseen emergencies. These imply that fitness is necessary for doing any work and at the same time it vary in individuals and on the other hand it vary from time to time in the same person. The continuously changing life process creates different need and emphasis for different individuals, as they grow older. There is an optimum level of fitness for different age groups and for better understanding of physical fitness the components of physical fitness must be known. The components of physical fitness as listed by Larson and Yocomare are: Resistance to diseases, muscular strength,
muscular power, muscular endurance, cardiovascular endurance, flexibility, speed, agility, co-ordination, balance and accuracy.

Today the preparation of an athlete for top notch achievement is a completely dynamic state characterized by a high level of physical and physiological efficiency and degree of perfection of the necessary skills and knowledge, technique and tactical preparation. An athlete arrives at this stage only as a result of appropriate training. Thus, athlete's training today are a multisided process of expedient use of aggregate factor so as to influence the development of an athlete and ensure the necessary level of participation.

The success or failure of an individual athlete depends on the blending of physical ability, conditioning, training, mental preparation and the ability to perform well under pressure. It is not uncommon to hear coaches and athlete express disbelief on how poorly their team performed against a certain opponent or how they field in the crucial situation.

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In the modern scientific age, in every field of human endeavour, systematic, objective and scientific procedures are followed in accordance with principles based on experience, understanding and application of knowledge of science. The field of games and sports is no exception to this. In advanced countries like U.S.A., Germany, Russia, Australia, Britain and others, the rapid progress in the field of games and sports like athletics, soccer, badminton, etc. has taken place and their international achievements have been possible only due to research, experimentation and application of scientific knowledge.  

Today sport has become inseparable phenomenon of our social life. It has made its own place at the apex of human civilization because of its trial, competitive event and ever improving nature. The acquisition of new knowledge for betterment of performance of human being in relation to physical, motor and psychological qualities is in process of saturation. To strive for skill barrier is a million dollar question to the experts in sports. In the process they also explore the field of psychology and enlist certain psychological parameters which do influence sports performance.

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The concept of physical fitness, in general athletic terms, means the capability of the individual to meet the varied physical and physiological demands made by a sporting activity, without reducing the person to an excessively fatigued state. Such a state would be one in which he/she can no longer perform the skills of the activity accurately and successfully.\(^5\)

This is where the theoretical ideas involved in the discussion on the system that provide the energy necessary for human exercise become directly related to day-to-day sporting activities. This idea is that we should use our knowledge of the scientific basis of exercise to help us improve performance of our sport and do this in a systematic and predictable way. Unfortunately, nothing a human being does is ever thoroughly predictable, psychological, cultural and emotive factors tend to upset the true progress of science. However, it must be possible to enhance the aim of physical training by using what we know of physiology and the aim and objective of training are to improve performance, skill, game ability and motor and physical fitness.\(^6\)


\(^6\) Ibid. p.134.
Today sport has become mass participation; it is being adopted as fashion by some. It attracts the mass either for recreation or physical fitness, or as a profession.

Every sportsman has to be physically, physiologically and psychologically fit. This includes fitness, skill, physical endowment and psychological or behavioral dimensions.

Badminton occupies a significant place among sports and games. It is a game of masterful skill and deception, anticipation and concentration. It requires physical and mental attributes to be in the top gear to tackle all eventualities in a match. A match is won by the perfect amalgam of physical condition, experience, skills and most importantly, the coordination.

Badminton at its best: a game of swift and graceful movement, a power play contrastingly highlighted by a delicacy of touch, or wrong footing deception, of incredible retrieving and lightning interception, and of varied chess-like tactics of singles, doubles and mixed doubles, each an absorbing and different game in its own. 7

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A complete badminton player should possess the agility of an acrobat, power of a race horse, killer instinct of a panther, accuracy of a marksman, delicacy of a dancer, speed of a sprinter, leap of a high jumper, stamina of a marathon runner, creativity of an artist, agility of a gymnast and so on. His judgment has to be so sharp and accurate that he should be repeatedly able to send a shuttle to the inner edges of a line and if a shuttle is likely to fall only an inch outside he should leave it confidently. Instant coordination of all the above mentioned is a must for success. Any wavering can spell his doom.\(^8\)

An individual with a high level of motor ability, possessing the basic motor qualities necessary for achieving excellence in a number of activities, may still be unable to perform well in a particular sport unless he has developed specific skills for that sport through long hours of practice.

The world of training methodology has crossed many milestones as a result of different types of research in general and their application to sports development in particular. In the modern scientific age, athletes are being trained by highly sophisticated means for better achievement in their concerned sport. They are being exposed to the

exercises and training methods which have proved beneficial for achieving higher standards. Much progress has been made in the recent years in the acquisition of knowledge about training means and techniques of sports skills. In sport training specialized exercises are being prescribed for the fullest and optimum development for a particular game.9

For the physiological system of the body to be fit, it must function well enough to support the specific activity that the individual is performing. Moreover different activities make different demands upon the organism with respect to circulatory, metabolic, neurological and temperature regulative functions10.

In today's techno-scientific age, the world has completely changed in all aspects due to discovery and research. In the field of games and sports also, there has been a great change with the help of scientific coaching and training. The athletes are being trained on scientific guidelines with highly sophisticated means for better achievement in their concerned sport to enable the coaches to get

optimum performance with minimum expenditure of energy and time. They are being exposed to the exercise and training methods, which have got beneficial effect for achieving higher standards.

The main aspect to be emphasized in order to achieve high level of performance is the efficient function of the body. They must function well enough to support the particular activity that the individual is performing. Since different activities make different demands upon the organism with respect to blood circulation, respiration, metabolic, neurological and temperature regulating functions, physiological fitness is specific to activity. Human body is highly adaptable to exercise. The response of each system is discrete and hard work in the heat is necessary to improve the fitness of the temperature regulatory mechanism. Each task has its major physiological components and fitness for the task required is effective functioning of the appropriate system\textsuperscript{11}.

An efficient coach provides his or her athlete with a grasp of strategy, a physiological environment conducive to model level of performance, a means of learning skill and proper course of training.

Modern scientific methods of training players or team place greater responsibility on the coaches and physical educators. They are also responsible for the selection of team taking into consideration the physical and physiological qualities essential for the game.

In technical sports, beautiful and graceful movements are a product of well developed technical skills and coordinative activities. The coordinative abilities, to a great extent, determine the maximum limits to which sport performance can be improved in several sports, especially the sports which depend largely on technical and tactical factors.

There are seven identified coordinative abilities, namely, (i) Orientation ability, (ii) Differentiation ability, (iii) Coupling ability, (iv) Adaptation ability, (v) Rhythmic ability, (vi) Balance ability, (vii) Reaction ability. All the coordinative abilities are important for learning of sport techniques and for their continuous refinement and modifications during the long term training process. The motor learning ability depends to a large extent on the level of coordinative abilities\(^\text{13}\).


Coordinative abilities are primarily dependent on the motor control and regulation process of the central nervous system. For each coordinative ability the motor control and regulation process function in a definite pattern; when a particular aspect of these functions is improved then the sportsperson is in a better position to carry out a certain group of movements which for their execution depends on the Central Nervous System functioning pattern.\(^\text{14}\)

Hence by undertaking the present investigation the research scholar has made an attempt to determine the coordinative abilities and physiological characteristics of Badminton players of Delhi state at different levels.

Expert in training recently have been using the term 'technique' and coordinative abilities together as one performance factor (technique coordination or technique / coordination), since both are interrelated and interdependent. They have in common the process of the taking in and processing information for the regulation of action which enable the sportsman to direct and control his movement according to changing situation. Both these qualities postulate coordination of the nervous and muscular system. The learning of

motor movement has positive effect on coordination abilities necessary for the perfection of sports technique. Still these two qualities differ in the degree of their general training, methodic and the level of development. In case of motor skill, processes are largely automatised for the effective execution of a wide number of movements similar to each other.

Coordinative abilities play an important role in quick changing of the body position during game. In some sports like Gymnastics, coordinative abilities are very essential for better and effective movement for any execution of movement. In sports, coordination ability or the combination of various coordination abilities play a vital role for the execution of any skill or movement. The combination of various coordinative abilities is helpful for the execution of any movement or skill.

Coordination is important for exhibiting top class performance in games and sports and Badminton is no exception to it. The coordinative ability play a significant role in learning consolidation and mastery of skills. Swift shuffling and smashing occur frequently in Badminton and it is assumed that these skills may have strong relationship with coordinative abilities. A badminton player gets very
limited time to find the area of smash and enhanced reaction ability plays a vital role. Besides reaction ability the other abilities namely Balance, Rhythm, Coupling, Adaptation. Orientation ability, Balance ability play a vital role in the performance of skills in the Game of Badminton.

Motor coordination is a part and parcel of action regulation and is closely linked with the process of cognitive, psychic and movement execution aspect of an action. Coordinative abilities have also important and strong link with motor skills as motor coordination form the basis of both.

Coordinative abilities are primarily dependent on the motor central and regulation process of C.N.S. For each coordinative ability the central regulation process functions in a definite manner. When a particular aspect of this function is improved then the sportsman is in a better position to do a certain group of movements which for their execution depends on this type of C.N.S. function pattern.

Mind without muscles cannot make the human body functional and nor can the muscles strength make a top performance. So strength is an important component, which affects the performance in any
activity. Therefore, we can say that strength as one of factors plays an ever-increasing role in the modern system of training.\textsuperscript{15}

Coordination has been one of the key factor in terms of performance skill in a efficient manner. It is generally seen that top level player possess abundance of coordination for developing skill in variety of ways. While gleaning through the literature, the scholar did come across few studies of coordinative ability with respect to various games and sports but could not come across any study which may highlight the relationship of coordinative ability to performance in Badminton.

Statement of the Problem

The purpose of the study was to determine the Coordinative abilities and Physiological characteristics of Badminton Players of Delhi state at Different Age Levels

The other purpose of the study was to compare the coordinative abilities and physiological characteristics of badminton players of Delhi state at different age levels.

Delimitations

The study was delimited to the following variables.

I. Coordinative abilities:
   i. Reaction Ability
   ii. Orientation Ability
   iii. Differentiation Ability
   iv. Rhythmic Ability

II. Physiological variables
   i. Anaerobic Power
   ii. Vital Capacity
   iii. Resting Heart Rate
iv. Resting Respiratory Rate

v. Body Composition
   - Total Body Fat Percentage
   - Lean Body Weight

vi. Breath Holding Capacity
   - Positive Breath Holding Capacity
   - Negative Breath Holding Capacity

The study will also be delimited to the following levels

i. Senior

ii. Junior

iii. Sub Junior

Limitations

Certain factors like diet, daily routine habits, facilities, and training etc. that may affect the results of the study are considered as the limitations of the study.

Hypothesis

From the scholar’s own understanding of the problem and as gleaned through the available literature, it was hypothesized that in
relation to Coordinative abilities and Physiological characteristics of Badminton players of Delhi state there will be significant differences at different levels (Sub Junior, Junior and Senior)

**Definition and Explanation of the Terms**

**Coordinative Ability**

"Coordinative ability is understood are relatively stabilized and generalized pattern of motor control and regulation process. These enable the sportsman to do a series of movements with better quality and effect."\(^{16}\)

**Orientation ability**

It is the ability to determine and change the position and movement of the body in time and space in relation to a definite field of action\(^{17}\).

**Differentiation ability**

It is the ability to achieve a high level of fine tuning on harmony of individual movement phases and body part movement. The high

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\(^{17}\) Ibid P-166
level of differentiation ability depends on movement experience (i.e. motor memory) and the degree of mastery over motor action\textsuperscript{18}.

**Balance Ability**

It is the ability to maintain balance during whole body movement and to regain balance quickly after the balance disturbing movement\textsuperscript{19}.

**Reaction Ability**

It is the ability to react quickly and effectively to a signal\textsuperscript{20}.

**Rhythm Ability**

It is the ability to perceive the externally given rhythm and to reproduct it in motor action\textsuperscript{21}.

**Significance of the Study**

1. From a practical standpoint, this study will be important for coaches and trainers to adjust training regimes and concentrate


\textsuperscript{19} Ibid P-167

\textsuperscript{20} Ibid P-166

\textsuperscript{21} Ibid P-167
on the variable that was specific, to improve performance and achieve success in Badminton.

2. Players may evaluate themselves with the help of this study.

3. The study may be helpful in assessing the future prospects of the players.

4. The result of the study may provide an authentic understanding of role of various coordinative abilities to the performance of Badminton players.