Chapter I

INTRODUCTION

The desire to do one's best, to excel, to attain the highest standards of performance, to be supreme in his chosen field is a worthy human ambition which leads to better standards and personal growth. Excellence in any area do not come easily. The trail is hard and steep. There are numerous obstacles to overcome and barriers to push forth. Achievement of high skills in any field, (athletics, art, surgery, science, writing or teaching) demands commitment and sacrifice. The greatest barrier we confront in our pursuit of excellence is psychological in nature. Running a mile under four minutes was viewed as impossible until it was broken by Roger Bannister, when he clocked 3 minutes 59.5 seconds on 6th May, 1954. Since then four minutes barrier has been broken by approximately 500 athletes from all over the world. It was not the physiological make-up of runners that changed, but it was their psychological knowledge of what was possible. As man's beliefs about limits change, the limits themselves change.¹

The will to perform always urges forward and induces progress. The limits reached today shall be moved farther tomorrow. The will to perform is what makes a man enter untrampled territory and confront the unknown. When personal conditions are favourable and environmental conditions are excellent, optimum performance may be turned into maximum performance - into a record. The desire to perform is a basic drive, in-born and active in every person. It is the drive that leads to the development of natural qualities. The effort it triggers off leads to an improvement of capabilities and broadening of knowledge, thus contributing to perfection of personality.²

Winning laurels at international sports arena has become a prestige issue linked with political system and as such nations vie with each other to produce top class sportsmen for international competitions. For this scientific research is systematically conducted to identify the factors that help in achieving level of skill which a player can attain through proper coaching and evaluation.³


Scientific equipments and facilities are in vogue for the progress of games and sports. Grass and cinder traks, artificial turfs, indoor stadium, better equipments and sporting kits, year-round competitions, an expanding programme of physical education in schools, colleges and universities, scientific coaching schemes and ample published literature, concerned with techniques and ideas in training, have all done much to generate a general increase in interest in sports, to attract a good number of participants in games and sports and to raise the standards in all events.  

Competition is one of the out-growth of modern society. It is the challenge which stimulates, inspires and motivates men and women to sweat and run faster, jump higher, throw farther and exhibit greater strength, endurance and skills to exhibit supremacy over others. Every individual or a team which participates in any sport/game wants to win as our society attaches a great significance to winning. According to Renwes  

"Performance is the Key note of all sports - its basic principles. Since sports have become prestigious aspect to prove one's superiority, the philosophy of participation in games and sports has undergone

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a great change."

Competitive sports make tremendous demands on the physical condition, vitality, endurance, and mental powers of the participant. Only athletes in the finest condition can withstand the wear and tear of a competitive session; only the fittest can play to the best of their ability. Athletes not in conditions are prone to injury or "going stale", and might never make the team. Thus, proper conditioning not only is necessary in preparing for sports participation, but is of great importance in preventing injuries. The athlete who is properly trained and conditioned will sustain a lower incidence and severity of injuries and a higher level of performance. Individuals who are obese, awkward, considerably under weight, or ill-trained suffer the greatest number of injuries. The athlete who is properly conditioned rarely requires medical treatment for injuries. Proper conditioning requires the joint effort of the physicians, coach, trainer, and athlete.⁶

The value of strength in athletics is not a new idea by any means. Strength is indispensable for the success of any sport. In order to develop the strength of arms and shoulders, the muscles in these areas must be over loaded. If a boy plays a baseball,

he handles nothing heavier than a thirty-three ounce bat. A golf club, a tennis racket, and a basketball are even lighter. There is very little muscular development in the arms and shoulders to be gained by participating in any of these activities.  

To build strength means to build muscle. To build muscle requires a planned programme of resistance exercise on the basis of overload. The relationship are not a new discovery, but only recently have basketball coaches recognized the value of building strength and only a few utilize the information which is available for practical coaching purposes. The procedures simple but they require regular and persistent application to produce the desired result. 

In Basketball, strength for jumping and strength for shooting are of vital importance, and endurance to carry one through a game at top performance is essential quality. As a result of increasing the strength of the leg muscles by weight training as much as eight inches has been added to a player's jump.  

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9 Ibid.
Today play exists as a highly organised institution. Since the revival of modern olympics by Baron Pierre-de-Coubertin in 1896, ever increasing international interest and participation in games and sports has been observed. Improvements in achievement standard have been ever on the increase in all games and sports disciplines. The rapidity of record breaking performance has convinced the training, athlete and coaches of the futility of predicting the limits of human performance except in very general terms. With the enormous prestige attached to winning, training has lost its innocence. According to Handerson \(^{10}\) "Spyridon Lewis who developed olympic winning endurance by chasing his sheep across Greece Hills can no longer hope to compete at Olympic Level."

Physical fitness for any sports consists of a number of components or factors such as speed, strength, coordination, agility and endurance. Adequate physical fitness is a vital biological need, the neglect of which handicaps the total effectiveness of the individual.\(^{11,12}\)

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In games and sports, systematic training and conditioning of sportsmen play a vital role in building up peak performances. Therefore, specific training in games and sports has become a necessity for superior performances.

Today there is not a single sport in the world at the competitive level for which resistance training in some form or other is not used as a conditioning exercise. The day of general fitness training for top class sports are as much in the past as the scores of records that have been broken in recent years by athletes using more specific training methods. It is now recognised that muscular strength is the foundation upon which first class performance is built. 13

Training in games and sports is no longer a myth and it has no casual approach, but it provides opportunities for scientific process and verification. Training has been accepted as a highly specialised science. Physical education scientists are striving to understand the various factors affecting skeletal and muscular activity, during a variety of human movements with the help of electro-myography, and are engaged in analysing the

Eric Taylor, Training with Weights (London: John Murray Ltd., 1962); p. 4.
bio-mechanics of the performances of top athletes by focussing their attention upon the analysis of sports skills. They are consistently studying factors like strength, limb length, mass, inertia proportions and angular and linear velocity, that influence these movements, to get a better insight into the complexities of human motion and performance. The latest approach is aimed at the construction of a mathematical model of a skill in a form which is suitable for computer analysis so that it could be simulated under several carefully controlled conditions for predicting more effective techniques for higher performances.  

A general plan to follow to optimize sport performance is to emphasize skill training and gradually increase the conditioning aspect as skill improves. After performance levels off, it is necessary to determine the physiological mechanisms primarily stressed in the sport and figure out ways to develop them to a greater degree than is possible by just practicing the sport. A swimmer will find that an increase in strength beyond a certain point is not afforded by water. Consequently, to further improve swimming performance, a greater weight resistance against which the muscles contract must be employed. Weight training provides

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a means to over-load the muscles systematically to optimize strength improvement.\textsuperscript{15}

Accuracy is shooting a basketball or throwing a football is increased most by actually shooting or throwing. It is obvious that skill is best improved by practicing the activity for which skill is desired whether it is throwing a baseball, shot-putting, high jumping, pole vaulting or swimming. What is less obvious is the best training to improve physical condition for a sport. Coaches have had football and basketball athletes running long distances to improve physical condition for playing the game when other kinds of training are more appropriate. The decision as to the type of conditioning exercises to include a training programme is based on understanding the primary physiological systems stressed during a game, and the kinds of activities which best provide this type of stress during practice.

Even though the best training to improve sport performance is to practice the movements at the same rate and intensity as during an actual game situation, there are other types of training activities which are supplementary for improving performance.

\textsuperscript{15}Richard A. Berger, "Physical Conditioning is Specific to a Sport," \textit{The Athletic Journal} 53:9 (May 1973) : 60.
A football athlete may not be able to increase his speed in lateral movements no matter how many times the move is practiced because the limiting factor in performance is muscle strength rather than skill. The athlete's body weight is not heavy enough to overload the hip and leg muscle for an optimum improvement in strength. In this situation, weight training should supplement football training in order to build-up greater force of contraction in the running muscle.

Basketball enables a person to develop speed, strength, endurance, agility, neuro-muscular skills and coordinations of all parts of the body. Basketball is a complex activity involving the "total response" of the individual. A good player must possess certain emotional, organic and neuromuscular qualities. Thus, playing basketball brings about an all round development of the individual i.e. mental, physical, social and emotional development of the individual.

Basketball embodies the value of collaboration, friendship, fair play, loyalty to the group, respect for the law, etc. Educators all over the world are trying by various methods to inculcate these values in young people. They have come to realise, however, the mere preaching and lecturing do not achieve much, but rather, that arranging opportunities for young people to practice these values in a concrete manner on the playing fields through various
games is one of the best methods by which to adopt such standards of conduct and to identify with these values.\textsuperscript{16}

Despite the vast amount of research that has been done in athletic training, most of what were known have been gained empirically through sweat and tear on the training ground, rather than what has been discovered in the laboratories of human performance, physiology and psychology. It is only after training "method" has been found by coach or teacher or athlete or both that the physiologist and psychologist confirm its worth.\textsuperscript{17}

The development of the game of basketball is accompanied by evolving of several new training methods. Coaches and physical education teachers have been constantly employing different training methods to improve the performance of sport. Under the change and to determine the superiority of one method over the other. The methods found successful are being included in the training schedules so that players can attain optimal performance. As per the modern concept of training the techniques, tactics and strategies alone are not sufficient for sportsmen and to use


them effectively under competitive condition. Sportsmen must be in top form and all the motor qualities should be developed to their optimal level. In the case of basketball players, we are interested in making those changes that will lead to optimal playing ability. Numerous excellent training programmes have emerged in recent years. It has been realised by coaches that if something extra is provided, their players have a decided advantage. Training has not been advocated as a panacea for all basketball problems but simply as one of the many important phases of preparing individuals for basketball competitions.¹⁸

Due to the fact that basketball is an intense and demanding sport, coaches agree that conditioning is one of the most important aspects of winning games. In order to achieve top condition, the players must execute complex skills at high speed and often these skills must be performed after a player has run long distances. Thus, the winning team is often the one that is in the best condition.

Over the past few years coaches have experimented with various methods of getting the team into top condition. Since it is their belief that basketball conditioning has both physical and mental dimensions, the sequence of drills has given what

¹⁸Dale L. Hanson, "Scientific Bases of Post-Season and Early Season Training for Basketball," The Athletic Journal XLVI (September 1965) : 80.
coaches have been seeking. The sequence of drills is used for three or four weeks at the beginning of the practice season. One hundred per cent effort is demanded from every player throughout the entire sequence. Although very few players enjoy this part of practice, they do seem to take pride in the fact that they go through what we believe is the toughest conditioning programme in existence. The results of this programme are both physical and mental. Each player must develop mental self-discipline to push himself beyond what is comfortable physically. This becomes extremely important in the late stages of a close game when players who lack self-discipline are likely to let-up as they become tired. In addition to mental conditioning, this type of effort also develops supreme physical condition.

Another advantage which conditioning sequence gives is development of team morale. When a group goes through something difficult, the participants begin to depend on each other. They encourage each other and that's how team morale develops.

In addition, this drill sequence sets the tone, so to speak, for team discipline. It enables the coaching staff to establish the idea that each player has the responsibility of giving 100 per cent of this potential effort.\textsuperscript{19}

Proper conditioning is commonly recognised as one of the most important elements of any strenuous sport. Any player who cannot function at maximum efficiency throughout a contest will be unable to help the team attain its goals. Therefore, it must be a priority for any coach to work his or her team into its peak physical condition.

To develop maximum efficiency, a player must increase muscular strength to mobilize the force to accomplish desired tasks. Further, increased muscular strength will also improve muscular endurance, necessary for continued effort over a prolonged period of time.  

Proper conditioning also helps prevent injuries. Physicians support the theory that 60 per cent of all injuries incurred in baseball are due to poor mental and physical conditioning. Thus it is important that basketball players be in top physical condition, and be mentally prepared for practices and games.

Soviet Coach Prof. Ozolin, writing about the intensity and load in conditioning training draws attention to the fact that increased intensity will decrease the training duration. He suggests

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21 Ibid.
that athletes involved in fast and explosive events should keep it in mind and revise their approach to conditioning accordingly.

To put the shot a hundred times or pole vault forty times in a training session is not the limit. Specific exercises should be added to increase the training load. In endurance events two to three hours training is universally accepted. The minimum to achieve proper conditioning in explosive events should be at least an hour every day. This, of course, can be divided into more than one session.

It is also important to distribute the training load properly. At the first glance the best method seems to be that of constant intensity and progressively increased load. However, this has both psychological and psychological dis-advantages.

Optimum intensity in training can be achieved by increasing or decreasing the intensity and adjusting the duration of training accordingly. As the athlete's organism responds best to a changeable pattern a three-day cycle is recommended. On the first day, the training is intensive but of short duration. The second day has an optimum intensity and a slightly increased load. The final day of the cycle has the smallest intensity and greatest duration.

As higher intensity shortens the duration of the exercise, the number of repetitions has to be increased progressively. Exer-
cises with complicated movements and coordination cause a lot of stress on the nervous system and therefore require longer recovery intervals. As the number of repetitions increases medium and long recoveries has to be introduced.\textsuperscript{22}

Literature reveals that circuit training and weight training are not only contributing factors in the performance of motor tasks that is, they not only develop speed, strength, endurance, flexibility, agility and coordination but also help in learning and improving skills in different games and sports. Therefore, the researcher felt it was necessary to conduct a study to find out the comparative effectiveness of specific circuit training, weight training and combination training on selected skills among basketball players.

**Statement of the Problem**

The purpose of the study was to find out the comparative effectiveness of specific circuit training, weight training and combination training on selected skills among basketball players.

**Delimitation**

The following are the delimitations of the study:

1. The study was delimited to high school boys of 14 to 16 years of age.

2. The study was further delimited to specific circuit training, weight training and combination training related to basketball.

\textsuperscript{22}N. Ozolin, "Specific Conditioning," *Track Technique* 27 (March 1967): 841.
3. The study was again delimited to the observation of these three programmes on selected skills among basketball players.

4. Criterion measure for assessing selected skills will be AALPER Basketball Skill Test for boys.

Limitations

1. The subject could not be kept under complete control outside the class session and for this reason randomisation of the uncontrolled variables and nullification of the possible effects of such variables were assumed.

2. No special motivational technique were used to influence the subjects' performance. However, they were encouraged to do their best. Variations that might have occurred in their performance due to lack of the same degree of motivation at the time of pre test and post tests were recognised as a limitation of the study.

Hypothesis

It is hypothesised that all the three different types of training will have different degrees of effect on selected basketball skills among basketball players.

Definition and Explanation of Terms

Skill

Skill is that element of performance that enables the performer to accomplish a large amount of work with a relatively small amount of effort.\textsuperscript{23}

\textsuperscript{23}Lawrence E. Moorehouse, and Augustus T. Miller, Physiology of Exercise (St. Louis : C.V. Mosby Company, 1963), p. 50.
Training

The periodical repetition of a given action aimed at its perfection to obtain maximum of result with the minimum of energy expenditure. 24

Specific Circuit Training

A circuit consist of a number of carefully selected specific exercises which are simple to perform and arranged in the form of a circuit, in such a manner as to enable large numbers of individuals to proceed from one exercise to another without undue local fatigue, and at a work rate compatible with each person's capacity. Progression on a circuit is measured initially by decreasing time of performance, and secondly by increasing load of repetitions.

Specific Weight Training

Specific Weight Training is the use of weights in specific exercising to develop muscle power and strength by the overload principles.

Significance of the Study

1. The results of the study will help the coaches and physical education teachers to understand the effect of specific

circuit training, weight training and combination training on selected skills among basketball players.

2. The coaches, physical education teachers and players will be able to visualize the importance of these three training methods to improve the performance level of basketball players.

3. The study will further clear the misconceptions about weight training and circuit training which normally sportsman have that weight training is only to build good physique and is not a contributing factor to overall performance in basketball.