Chapter I

INTRODUCTION

William G. Morgan, an instructor in YMCA had a great desire and dream to introduce a suitable game without much body contact and to incorporate many rules and intricacies of basketball, baseball, tennis and handball for all age group and both the sexes to play in a limited space. He tailored a game with a name mintonette with a borrowed tennis net. He raised the net to 6 feet 6 inches above the floor just above the height of an average American. By the actions of volleying the volleying the back and forth to either side of the net might have brought the name of Volleyball to the game invented 120 years back.

Man after his creation, was very fit naturally due to his way of life. He had to be fit for securing his food. He had to run after animals for hunting them for food for his family and himself. At the same time, he had to be fit to keep his family and himself safe from wild animals. So, entire humanity had to be fit for living a life with food and free from dangers of his environment. When they were living in jungles as society and they had two primary tasks of earning a livelihood and being safe. The lame, old and unfit died. Only the fittest survived. They were using spears and blunt weapons for hunting and saving themselves from the threat of their life. They were agile, flexible, fast and stronger to run away from the chasing animals and climb trees and rocks.

When they were exposed into modern life with fire and weapons, they were depending more on the machinery. Slowly, they learnt to adopt themselves into the modern world. They became attracted towards easy way of life due to inventions of modern gadgets. They became dependant of transport and forgot the original way of reaching places by self locomotion, walking. Still, when the science and technology advanced, the humanity became dependant on so many other mechanisms for their daily needs. Grinding on stones turned into grinding with
grinders. Pounding became nonexistent and rice mills came into existence. Washing became mechanized. Like this, the sedentary life style crept into the lives of originally fit humans.

In the leisure time, ancient humanity indulged in competitions with their spears as to how far and how accurate they could throw. They ran to find out who was the fastest. Their leisure time was decided by them and the activities were multifarious. The diverse skills of humans are today being exhibited in the modern forms of games and athletics. The activities have incarnated into the modern forms of Olympic games. The first demonstration game of mintonette or the modern volleyball was played at Springfield College after one year of the inception. After four years of the first game played, a special ball was designed. From then on, the game had grown in leaps and bounds to the level of very competitive international game involving a set of special skills and tactics and is being played throughout the world with the adopted rules. It is today a game of talent, tactics and special powers and is being competed by almost all the countries of the world. The game had become very competitive and fast. The reason behind the change in the style of the game is due to the change of rules and the techniques. The change of rules in this game demand very specific and excellent skills with every player.

Gabbett et al. (2006) investigated the effect of a skill-based training program on measurements of skill and physical fitness in talent-identified volleyball players. Twenty-six talented junior volleyball players (mean +/- SE age, 15.5 +/- 0.2 years) participated in an 8-week skill-based training program that included 3 skill-based court sessions per week. Skills sessions were designed to develop passing, setting, serving, spiking, and blocking technique and accuracy as well as game tactics and positioning skills. Coaches used a combination of technical and instructional coaching, coupled with skill-based games to facilitate learning. Subjects performed measurements of skill (passing, setting, serving, and spiking technique and accuracy), standard anthropometry (height, standing-reach height, body mass, and sum of 7 skinfolds), lower-body muscular power (vertical jump, spike jump), upper-body muscular power (over-head medicine-ball throw), speed (5-and 10-m sprint), agility (T-test), and maximal aerobic power (multistage fitness test) before and after training. The training processes induced significant (p < 0.05) improvements in spiking, setting, and passing
accuracy and spiking and passing technique. Compared with pre training, there were significant (p < 0.05) improvements in 5-and 10-m speed and agility. There were no significant differences between pre training and post training for body mass, skin fold thickness, lower-body muscular power, upper-body muscular power, and maximal aerobic power. These findings demonstrated that skill-based volleyball training improved spiking, setting, and passing accuracy and spiking and passing technique, but had little effect on the physiological and anthropometric characteristics of players.

Hillis and Okrainec (2015) purposed their study to determine if non-linear training two days a week could maintain upper and lower body strength, and vertical jump power and height over the course of a competitive volleyball season, measured at three time points. Eleven trained Canadian Interuniversity Sport (CIS) male athletes were a part of a single training group which completed a maintenance program consisting of non-linear training for 17 weeks. At each testing time point, the participants completed a bench press, squat, squat jump, countermovement jump, and three step jump and reach. We predicted that non-linear resistance training of mixed intensities twice a week would allow players to maintain strength, vertical jump power, and vertical jump height. Results indicated that upper body strength can be maintained over the course of a competition period with non-linear resistance training (p = 0.043). Scores for lower body strength, vertical jump squat jump power, vertical jump countermovement jump power, and vertical jump height increased over the course of the season (p's < 0.001, 0.14, 0.181, and 0.006, respectively). Our results indicate that male volleyball players can benefit from non-linear training to maintain or improve performance when training at > 80% 1 RM to failure once a week during a competition season.

The above studies highlight the need for the specific physical skills for being stupendous in their game. They also described the main skills as serving, volleying and spiking. To master these skills in the game, the players had to possess very good physiological proficiency. To perform the volleyball skills in an exciting and outstanding way, the physiological skills need to be very sharp and exemplary, perfect and consummate.

The reported health benefits of a more active lifestyle include diminished incidence of cardiovascular disease and certain cancers, more favourable blood lipid profiles, lesser body
weight and abdominal fat distribution, reduced blood pressure, decreased risk of osteoporosis, enhanced glucose disposal and improved psychosocial function. Unfortunately, only approximately 20% of the normal population is doing exercises with sufficient regularity to achieve optimal health benefits. The disease prevention benefits of exercise have been widely acknowledged.

1.1 Synopsis of Volleyball game

Volleyball is a game played by two teams of six players each. It is played on a rectangular court, 18 meters long and 9 meters wide, separated into two 9-meter squares by a net. The height of the net for men is 8' and for women it is 7' 4 1/4". The object of the game is to have the ball strike the floor on the opponent's side of the net on or within the boundary lines. One team serves the ball to the other team, and the team receiving the serve attempts to re-turn the ball over the net (a blocked ball does not count as one hit). The right back player is the server, with players assuming the serving position by rotating in a clockwise direction. A team only makes points when it serves and the serving team keeps the serve, with the same person serving, as long as it continues to score. The opponent, or receiving team, is awarded the opportunity to serve when the serving team fails to score. The serve must cross the net without touching the net or any of the serving team's players. The first team scoring 15 points, provided there is a two-point advantage, wins the game. Normally, a match consists of the best two out of three games or three out of five. Other basic rules are: after a ball is served all players on a team may play anywhere on their side of the net; a player may not touch the net or the floor on the opponent's side of the net, a blocker may reach over the top of the net but a spiker may not; the ball must be clearly hit and may not visibly come to rest on a player's body; the ball must be played by some part of the body above the waist; the ball may not strike the body twice in succession. (Volleyball overview, n.d.)

1.2 The Impact of new scoring system

The new scoring system has made the game more exiting, at least from a spectator standpoint. The new scoring system has decreased, on average, the duration of volleyball matches (which was the intent in the first place). In the 1999 World League, the average length of all matches played was 1h46 (with the average playing time being 1h30) while the
average length of games was 23 minutes. At the NTCC, the average length of all matches played on the Women's side (all matches were best of 5) was 1h38 (no data on actual playing time) with the average duration of games being 24 minutes. On the Men's side, best of 5 matches averaged 1h29 while games were 24 minutes long on average. But the decrease in length should be less significant for lower levels. Up to a point where bantam and midget teams might actually play longer with the rally-point system. The new scoring system has bridged the gap between the top teams and the teams below, at any given level. Now that most of the points are being scored from the serve receive phase, teams with a weaker defense will not be disadvantaged as much, therefore games will be closer. In the World League, the percentage of matches ending 3-0 has decreased from 48% (between 1990 and 1998) to 34% in 1999. Furthermore, the final score for 76% of all games played (297) this past summer (in the World League) ranged between 25-18 and 26-24. *(Impact of the new rules- Volleyball Canada, n.d)*

### 1.3 Impact of Libero rule

The libero rule has not yet made a big difference on the total number of balls dug by a team or on the serve receives efficiencies. Furthermore, liberos do not seem to dig more balls than other players on the team (the real question might be: "Is the libero digging more balls than the player he/she replaced would have?"). This could be attributed to the fact that since this is a new position, most of the players playing it are not significantly better than the regular players (which might not be the case in 2 or 3 years). Although at this point coaches are using the libero almost exclusively in replacement of middle players, variations (and uncertainties) exist from team to team as to how to use the libero. The most common scenario has the libero replacing both middle players after they serve and staying in for 3 full rotations (2 ½ to be more precise). Some teams have done it for only 1 of the 2 middle players (Russian Junior National Team, for example). As a result, the libero only plays "half the match". Some teams have used the 1st scenario with the middle players returning to the back row once in a while throughout the game to increase back-row attack possibilities (Team Canada Men). And then some teams have chosen not to use the libero at all (Cuba Women, Mexico Junior Women, Yugoslavia Men...). It will be interesting to see how the use of the libero will develop domestically. Time will tell… *(Impact of the new rules- Volleyball Canada, n.d)*
1.4 Serving and serve receive

The first reaction from a lot of people was that serving was going to become less aggressive with the new scoring system because a missed serve is now a point for the opponent. Although an easy serve will probably result in a serve receive point by the opponent, it seems that serving HAS become less aggressive, in general (It is however a tendency that should fade away as teams become more familiar and more comfortable with the rally point game). Teams seem to "make sure" a lot more than they used to, especially if the score is close (2-point difference or less). With a 3-point lead or more, the risk taking grows dramatically. We should see an increase of time spent on serving in training, to improve consistency, accuracy and control, especially at the grass root level. Keep also in mind that since players are now only allowed one toss (as opposed to 2), this toss becomes more important (especially for spike servers) as does the training of it.

Because of the fact that teams can now score points from their serve receive phase, and given the percentages, most of the points are (and will be) scored from that phase. We will see an increase in the amount of time spent on training serve receive to attack and a decrease in time spent on training defense to attack. Keep in mind that now, to win a game, only a few points coming from the defensive phase are needed by a team, or at least a few more (2 to be precise) than the opposing team is going to score on theirs. (Impact of the new rules-Volleyball Canada, n.d)

1.5 Motor Fitness Variables

For every volleyball player, agility, speed of movement and explosive leg strength are the very important skills out of the different motor qualities. Power, the explosive aspect of strength, is the product of strength and speed of movement. Although absolute strength is an important component of performance, power is even more important for most of the activities like volleyball. The important components required of the volleyball players are strength, power, speed, endurance, flexibility, technique, coordination, recovery, mental preparation and diet. Hence, the scholar in his present study, decided to experiment the following motor behaviour after a due consideration and experimentation,
1. Agility
2. speed
3. leg explosive power

The physical and psychological benefits of resistance training are well established. Resistance training exercises have been shown to raise the level of protective high-density lipoprotein, to improve physical fitness, and to reduce blood pressure among hypertensive. Exercises also seem to have positive psychological effects, which have been partially attributed to biochemical changes such as increased levels of endorphins and nor epinephrine. There is promising evidence that strength training and other forms of exercise in older adults preserve the ability to maintain independent living status and reduce the risk of falling sick. Physical activity appears to relieve symptoms of depression, anxiety and improve mood status.

1.6 Psychological Variables

Sports can be a positive experience for a sportsperson. Many aspects of psychological growth can result from sports participation. They are as follows:

1. Improves health related quality of life.
2. Improves one’s mood status.
3. Alleviates symptoms associated with mild depression.
4. Reduces anxiety.
5. Enhances self concept, self esteem, self efficacy and self confidence.
6. Offers opportunities to experience ‘peak’ moment.
7. Provides recreation and a change of pace.
8. Offers an opportunity for individuals to challenge themselves and strive for mastery.
9. Offers creative and aesthetic experiences.
10. Increasing recognition of physical activity as a therapeutic modality.

Alkhigani et. al (2015), considered one of the psychological variables which should be found for the volleyball players because the ball's speed during its circulation inside the
playground which required a big mental preparing of players. The skill self should be found with the volleyball players in the college because of its importance in achieving the victims which led the researchers to search. The achievement motivation which the male and female students should be enjoyed whether in their practical lessons or theoretical lessons and whether it was teaching or training should be given importance and focus. They recognized the psychological variables were very important like the mental alertness and the skill self and the achievement motivation so it was important for the volleyball players to know it in the college of physical fitness.

Taking into consideration of the previous studies, the researcher decided as important the following psychological variables:

1. Sports Competition Anxiety
2. Achievement Motivation
3. Self Confidence

1.7 Volleyball Skill Related variables

García-de-Alcaraz et.al (2015) had the aim of their study to analyze male volleyball players' technical-tactical performance profile of the spike (attack and counterattack) at various age groups and categories. The sample comprised 16,467 spike actions (8,890 attacks and 7,577 counterattacks) performed by 986 players in 299 sets from various categories (U-14, U-16, U-19, national senior, and international senior). A descriptive and correlational inter-and intragroup observational design was used. The variables studied were: category of competition, spike tempo, and spike performance. The results showed a significant increase in the use of fast-tempo attacks (first and second tempos) as well as a significant improvement in the performance of first tempo spikes (both attack and counterattack). An increase in the speed of the game by means of fast attacks is observed at higher age categories, which contributes to higher efficacy. This paper discusses various reasons for the evolution in the spike as well as the effects on the training process in different categories of competition in volleyball.
Silva et al. (2014) studied was to identify the volleyball skills that discriminate in favour of victory. Twenty-four games (n=24) from the Senior Men's Volleyball World Championship played in Italy in 2010 were chosen and analyzed with Data Volley software. The discriminating function was used to identify the discriminating variables, using a canonical structuring coefficient of |SC| >.30. The results suggest that service points, reception errors, and blocking errors were the discriminating variables that identify the final outcome of the match (victory/defeat). Moreover, successful service points were the major variable most likely associated with match success (victory). In this sense, increasing the effectiveness of service should be a top priority in coaching elite volleyball teams.

On the basis of the above studies, the scholar identified serving, receiving, volleying, setting, spiking, and blocking as the most desirable skills of any volleyball player who play in a very competitive tournaments and matches. Every player should possess all the skills or most of the skills. For the present study, the researcher selected the following volleyball playing skills:

1. Serving
2. Volleying and
3. Spiking

1.8 Statement of the Problem

The purpose of the study was to critically analyze and compare resistance training, mental training and combined training groups on selected motor, psychological and volleyball skill related variables among college men volleyball players of age groups between 19 and 24 years.

1.9 Delimitations

The following delimitations were applied to this study.

1. The study was confined only to 120 male volleyball players among the volleyball players of Velammal Engineering College in Chennai city.
2. The study was restricted to 30 players each for Resistance training group, mental training group, combined training group and the control Group.

3. The age of the subjects ranged between 19 and 24 years.
4. The following criterion motor variables were selected for this study under namely agility, speed and leg explosive power.
5. The following criterion psychological variables were selected for this study namely sports competition anxiety, achievement motivation and self confidence.

### 1.10 Limitations

The following limitations were considered while interpreting the results of the study.

1. The previous experience and exposure of the subjects to the resistance training or mental training used in this study which might have influenced while testing the variables was not considered.

2. The factors, food habits, rest period, life style and extracurricular activities were not controlled.

3. The atmospheric temperature, humidity and meteorological factors during testing were also not considered.

4. Though the subjects were motivated verbally, no attempt was made to differentiate the motivation level during the period of testing.

### 1.11 Hypotheses

It was hypothesized that

1. There would be a significant difference on the selected motor variables among the resistance training group, mental training group, combined training group and the control group.
2. There would be a significant difference on the selected psychological variables among the resistance training group, mental training group, combined training group and the control group.

3. There would be a significant difference on the selected volleyball skill related variables among the resistance training group, mental training group, combined training group and the control group.

1.12 Significance of the study

a. The findings of the study will add to the existing knowledge with regard to the selected variables among the participants of the study.

b. The results of the study might provide guidance to the participants the ways to improve their volleyball playing ability and meet the physical demands of the game.

c. The results of the study might provide guidance to the participants the ways to improve their volleyball playing ability and meet the mental abilities required for the game.

d. The finding of this study will add to the quantum of knowledge in the area of training methods for producing the best volleyball players.

e. This study will endow with the importance of psychological mettle necessary for the present day volleyball players.

f. A unique aspect of this work was that it included recommendations for the practical use of the research finding to the public at large

1.13 Definition of operational terms

1.13.1 Agility

Agility is also influenced by body balance, coordination, the position of the center of gravity, as well as running speed and skill. Agility can be improved with agility training drills
but also by improving the specific individual fitness elements of speed, balance, power and coordination. Agility is one of the main fitness components, important for success in many sports, such as in the team sports of football and hockey, and in individual sports of tennis and squash. A vote of the top sports requiring agility has the sports of soccer, basketball and tennis ranked highest. See also another list ranking sports in which agility is important. (Agility, n.d.)

### 1.13.2 Speed

Speed is a key component of a physical fitness definition because of its wide application to many human activities. It is the maximal velocity that can be reached by part or all of the body. The speed of a sprinter is greater than that of a distance runner, although the distance runner can sustain his speed much longer. In some sports, the body as a whole does not move fast, but a part of the body does. In baseball pitching, for example, the hand and ball accelerate to great speed while the body as a whole barely changes its location. (Speed, n.d.)

### 1.13.3 Leg explosive power

Simply put, explosive strength refers to an individual’s ability to exert a maximal amount of force in the shortest possible time interval. In summary, explosive strength refers to the ability to exert a maximal amount of force in the shortest possible time interval. Power (which results from explosive strength) can be represented as:

\[ \text{Power (P)} = \text{Force (F)} \times \text{Velocity (V)} \]  

(Explosive power, n.d.)

### 1.13.4 Sports competition anxiety

Competition can cause athletes to react both physically (somatic) and mentally (cognitive) in a manner which can negatively affect their performance abilities. Stress, arousal and anxiety are terms used to describe this condition. The major problem in competition is letting your mind work against you rather than for you. You must accept anxiety symptoms as part and parcel of the competition experience; only then will anxiety begin to facilitate your performance. (Sports competition anxiety, n.d.)
1.13.5 Achievement motivation

Achievement contexts can be found anywhere—on the playing field, on stage, in an art studio, or even in a kitchen or a garden. To be sure, standards and even the definitions of success vary among contexts. In sports success usually means winning, although it could also be defined in terms of personal improvement. Success for a pianist might be measured in the length of applause or in newspaper reviews, for a hostess in the amount of food the guests consume, and for a surgeon in patient survival rates. This article focuses primarily on school contexts, but most of the issues discussed apply to any context that involves some standard against which performance can be measured—any situation that offers the opportunity to succeed or fail. (Achievement motivation, n.d.)

1.13.6 Self confidence

Confidence results from the comparison an athlete makes between the goal and their ability. The athlete will have self-confidence if they believe they can achieve their goal. ( Comes back to a quote of mine - "You only achieve what you believe").

When an athlete has self confidence they will tend to: persevere even when things are not going to plan, show enthusiasm, be positive in their approach and take their share of the responsibility in success and fail.

To improve their self confidence, an athlete can use mental imagery to:

- visualise previous good performance to remind them of the look and feel
- imagine various scenarios and how they will cope with them

Good goal setting (challenging yet realistic) can bring feelings of success. If athletes can see that they are achieving their short term goals and moving towards their long term goals then confidence grows.

Confidence is a positive state of mind and a belief that you can meet the challenge ahead - a feeling of being in control. It is not the situation that directly affects confidence; thoughts, assumptions and expectations can build or destroy confidence.
High self confidence

- Thoughts - positive thoughts of success
- Feelings - excited, anticipation, calm, elation, prepared
- Focus - on self, on the task
- Behaviour - give maximum effort and commitment, willing to take chances, positive reaction to setbacks, open to learning, take responsibility for outcomes

Low self confidence

- Thoughts - negative, defeat or failure, doubt
- Feelings - tense, dread, fear, not wanting to take part
- Focus - on others, on less relevant factors (coach, umpire, conditions)
- Behaviour - lack of effort, likely to give up, unwilling to take risks (rather play safe), blame others or conditions for outcome. (*Self confidence, n.d.*)

1.13.7 Volleyball serving skill

The volleyball techniques for serving are probably the easiest skills in volleyball to learn. When executing a serve, the player tosses the ball to themselves. Since a server has complete control over everything involved (the toss, getting in position, etc), these factors make the skill of serving a lot easier to learn than other volleyball skills.

The following are important cues for serving.

- Draw the arm back.
- Take a small step and toss.
- Hit the ball with the palm of the hand. (*Volleyball skills, n.d.*)

1.13.8 Volleyball volleying skill

Passing is a very important skill in volleyball because without a pass, a team can't run an offense. A passer's main job is to communicate with teammates and get the ball to the setter.
The ball needs to be passed in such a way that makes it easy for the setter to set the ball. The better the pass, the better the set. The better the set, the easier it is for an attacker to spike the ball. The better the spike, the more likely the team will win the rally and score the point. Just like other basic skills in volleyball, it’s important to learn proper volleyball techniques for passing. The following are tips for learning how to pass...

- Stand with the body weight on the balls of the feet. Be in an athletic position ready to move.
- Get the platform out early.
- This means the arms should be out and hands together ready to pass the ball.
- Angle the arms toward the target.
- Gentle shoulder shrug as you pass.
- For offline passing deep balls, drop the front shoulder while angling the platform towards the target. (Volleyball skills, n.d.)

1.13.9 Volleyball spiking skill

Perhaps the most fun of all the volleyball techniques is spiking. The volleyball approach and spike is one of the most beautiful athletic movements in all of sports. It's also a very important skill in volleyball. The better a team is at spiking, the more likely a team will have successful hits that result in winning rallies. Spiking is a lot of fun. However, of all the volleyball techniques, it's probably the most technical.

In order to be a good hitter, you need to practice and develop a consistent spiking technique. The following are tips for learning how to spike...

- First, recognize whether or not you need to help out with the pass or the set.
- Next, communicate with and watch your teammates pass. Watch the setter. Try to predict what is going to happen.
- Line up for your approach.
- Read the set coming.
• Start your approach. Use the correct footsteps (left-right-left for right handers)
• Plant from the appropriate spot to jump.
• While approaching, bring the arms back then forward and up as you jump. Jump off both feet.
• Bow and arrow the arms and hands.
• Have the hitting arm vertical when making contact with the ball.
• Focus on contacting the ball with the entire hand.
• Contact the ball with the hand in a claw-like fashion.
• The ball should have topspin after making contact. If the ball doesn't spin, then you didn't claw. (Volleyball skills, n.d.)