CHAPTER: FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1. SUMMARY:

Sports training are a complex process consisting of various training content element and aspects. For optimum effect of those factors that must be arranged in a definite system in which the volume and temporal relation of each factor to other factors is optimum.

The main point of training, is primarily to develop strength and endurance in the type of work in which an improvement is sought for. It is very usual, within a month, reasonable amount of fitness, speed, strength, flexibility and so on, are seen to be increased. But this disappears when training is discontinued.

Sports performance is a unity of execution and result of sports action or a complex sequence of sports actions measured or evaluated according to agreed and socially determined norms.

The game of football (soccer) was introduced in India in the year 1840 by the Britishes. The Indian Football Association (IFA) was established in the year 1878 and the game became gradually popular in India. In India this game is controlled by the All Indian Football Association (AIFF) that conducts differential national championship. The Trophy awarded in this competition is called 'Santosh Trophy which was donated in the memory of Manmatha Nath Roy Chowdhury of Santosh, presently in Bangladesh.

The popularity of volleyball in India made it the only game to make a stable place in the South Asian Federation Games (SAF) in 1987 in Kolkata. In the year
1991, the Indian Volleyball team regained its gold medal in Colombo games. The Indian Women Volleyball team distinguished itself in the 1993 SAF games in Dhaka, although it is yet to make a mark in the Asian games. Indian volleyball witnessed its best in the year 2003, when the Indian team won an Asian Games title at the Rajiv Gandhi Port indoor stadium in Vishakhapatnam. The Indian junior team also qualified for the World Championship at the end of the year 2002. It won the Asian Games in Iran in 2010.

Plyometrics is a type of exercise that utilizes a rapid eccentric movement, followed by a short amortization phase, and then followed by an explosive concentric movement which enables the synergistic muscles to engage in the myotatic- stretch reflex during the stretch- shortening cycle. Plyometric exercises use explosive movements to develop muscular power, the ability to generate a large amount of force quickly. Plyometric training, acts on both the musculotendinous and neurological levels to increase an athlete's power output without necessarily increasing their maximum strength output. Plyometrics are used to increase the speed or force of muscular contractions, often with goals of increasing the height of a jump or speed of a punch or throw (Medical Dictionary for the Professionals and Nursing).

‘Speed-Strength’ is the ability of the neuromuscular system to produce tile greatest possible impulse in the shortest possible time. Speed-Strength is defined as work divided by time, where work is defined as Force x Distance. Therefore, speed-strength is defined as Force x Distance, divided by time. Speed strength is characterized by three distinct components:

(i) Starting Strength: Defined as the ability to recruit as motor units (MU) as possible instantaneously at the start of movement.
(iii) Explosive Strength: This quality refers to acceleration or rate of force development. In other words, once any one has recruited a maximal number of Motor Units, how long can he keep them recruited?

Modern-day volleyball is dominated by techniques which require two-foot take-off jumps. Nevertheless, the speed of movement and the suddenness of the actions have forced volleyball players to use single foot take-off jumps during serves, lifts, spikes, blocks and other techniques. Exercises involving two-foot take-off jumps mainly dominate modern-day training techniques. Thus, there is a need to study to which extent exercises involving two-foot take-off jumps affect the efficiency of single foot take-off jumps (Valdan Milic, et. al. 2008).

The subject matter of this study is to determine the effects of plyometric training exercises on the development of explosive leg strength among the volleyball players. The possible relations and differences between the quantitative indicators of jumping height in the case of the two-foot take-off and single foot take-off block and spike jumps stand out as a special point of interest. What would especially be beneficial for volleyball training is the study of whether the use of a plyometric program has the same effect on the effectiveness of explosive strength among volleyball-specific block jumps, spike jumps (in the case of both two-feet and single foot jumps), the depth jump and the triple standing jump.

In the present study a special emphasis has been given to find out the effectiveness of Sped-Strength and Plyometric training on football shooting, volleyball service and take-off height performance.

The investigator desired to find out the relationship of motor ability with soccer shooting velocity, service velocity and take-off height of both Plyometric training and Speed-Strength training group.
Twenty two male volleyball players and twenty male football players of 16 through 21 years age group were randomly selected as subjects from two organizations of Hooghly district under the state of West Bengal.

i. There will be improvement in velocity of ball volleyball service due to Speed-Strength training.

ii. There will be improvement in two-foot take-off height due to Speed-Strength training

iii. There will be no difference in performance in soccer following two types of training method.

iv. There will be no difference in performance in volleyball following two types of training method.

v. Plyometric training is an effective means in improving leg explosive power.

vi. Plyometric training will be more effective in soccer than Volleyball.

vii. Speed-Strength training will be improved 30 m sprint, standing long jump and 3-jump ability.

viii. There will be significant correlation between Take-off height and all motor fitness components.

ix. There will be high relationship between shooting velocity in soccer and leg explosive power test.

The necessary related literature has been reviewed to get a clear direction in the study.

Typical athletic movements are characterized by the occurrence of a special strength variant which is called explosive leg strength. Explosive strength is defined as the individual ability of the neuro-muscular system to manifest strain in the shortest possible time-span (Verhošanski, 1979).
Kollath and Quade (1993) showed that professionals were significantly quicker than amateurs over 10m, 20m and 30m. The acceleration difference to 10m was especially significant. This suggests that better players need superior acceleration and maximum speed to play at a higher level. Interestingly, the 30m speed was similar for the German professionals regardless of position.

The results of studies of various authors have proved that explosive strength training leads to better adaptations of the CNS and a greater increase in strength and jumping ability (Wilson, Newton, Murphy, & Humphres, 1993; Harris, Stone, O Bryan, Proulx, & Johnson, 1999; Blakey & Southard, 1987; Hevett, Stroupe, Nance, & Noyes, 1996; Hagl, 2003; Paul, Jeffrey, Mathew, John, Michael, & Robert, 2003).

In his definition of explosive strength, (Zatziorsky, 1995) introduced the notion of reversible strength which consists of two phases: the eccentric (stretch) and concentric (shortening) phase. The concentric phase should follow the muscle extension phase that precedes it as soon as possible.

Apor (1998) suggests, in making fitness recommendations for footballers; that players need to develop the musculature of a sprinter. I have already mentioned the benefit of maximum leg-strength training with heavy resistances for developing acceleration and speed.

Volleyball players can hurt themselves while using the plyometric method if they do not meet the requirements regarding the basic structures of the landing and the rebound (the anatomic, dynamic, rhythmic and other structures, according to (Kostić, 2000).

Valdam Milic, et. al(2008) showed in their research work that six week plyometric training model (with an increase in excise intensity from 70% to 100%)
influences the statistically significant increase in explosive strength of the leg muscles, and this increase the jumping skills for the block jump, spike jump, depth jump and triple standing jump.

J M Sheppard(2012) showed that counter movement vertical jump and spike jump of the volleyball player significantly increased due to speed strength training.

Kimerly Nunley(2014) Showed that plyometric are exercises that challenge the athlete’s muscles explosively. With consistently plyometric training, football players can significantly increase their speed and power.

A set of standard tests – bent knee, sit-up, pull-up and three mile run were conducted to measure abdominal muscular endurance, arm muscular endurance and cardiovascular endurance respectively.

To measure the performance of soccer and volleyball velocity of service in volleyball, two foot take-off height for and shooting velocity were taken.

To improve the performance of soccer and volleyball two different training were applied on the subjects. Two different training methods were plyometric training method and speed-strength training. Plyometric exercise protocol was consists of bounds, hurdle hopping, single leg hopping, box jumps, depth jumps, tuck jumps, two legged hops, chest pass, incline push up depth jump, power drop, inline chest pass and vertical toss. Whereas, speed-strength training exercise protocol was consist of back squat, drop jumps, jumps ups, bench press, squat jumps and box jumps.

To assess the speed-strength training MJQ test battery was applied on the subjects. MJQ test battery comprised of three jumps, 30 m sprint, standing long jump and over head shot throw.

For analyzing the data, the standard statistical procedures were followed.
5.2. CONCLUSIONS:

The following conclusions are drawn the results of the study.

i. There was a difference in shooting velocity of football players.

ii. Shooting velocity in soccer is increased due to Speed-Strength.

iii. Eight week Plyometric training significantly improved the arm explosive strength which is manifested as the volleyball velocity during serving towards the opponent’s court.

iv. Speed-Strength training improved service velocity in volleyball.

v. The speed-Strength training method had the successful output in improving take-off height for spiking.

vi. There was improvement in take-off height for spiking of volleyball players due to Plyometric training.

vii. The plyometric training can improve muscular endurance of arm significantly.

viii. Without aerobic overloading only plyometric exercises are not conducive for improvement of cardio vascular endurance.

ix. Speed-Strength training programme improved arm endurance.

x. Speed-strength training with applied protocol was not conducive for the development of abdominal muscular endurance.

xi. Bench press exercise can also improve the muscular endurance.

xii. Appropriate Speed-Strength training exercises may enhance muscular endurance of abdomen.

xiii. Speed-Strength training could not improve muscular endurance (abdomen).

xiv. Plyometric training treatment given for the arm muscles was not adequate for development of muscular endurance of arm.

xv. Regular sit-up exercises enhanced abdominal muscular endurance.
xvi. The aerobic loading system under present Plyometric training protocol was adequate.

xvii. Speed-Strength training improved eccentric concentric contractile force of the concerned muscle.

xviii. The Speed-Strength training is highly effective for development of explosive strength of both limbs.

xix. Successive jumping ability is developed by speed-strength training.

xx. The load dynamics applied for the purpose was inappropriate in respect to the objective set for the study.

xxi. Plyometric training is better than speed-strength training for improving shooting velocity in soccer.

xxii. Plyometric training is an effective training means which improves explosive strength of the arm which in term increases the velocity of served ball.

xxiii. Spiking take-off height was improved through speed-strength training as compared to plyometric training.

xxiv. There is high positive correlation between sit-up and shooting velocity of soccer of speed-strength training group.

xxv. Significant correlation is found between 3mile run and shoot velocity in soccer of plyometric training group.

xxvi. There a high positive relationship between standing broad jump and shooting velocity soccer of plyometric training group.

xxvii. There is high positive correlation between pull up and volleyball service velocity of speed-strength training group.

xxviii. There is a significant correlation between 3 mile run and take-off height during spiking of volleyball of speed-strength training group.
5.3. RECOMMENDATIONS:

Following recommendations may be considered for further study in the related areas:

(i) It is recommended that the Speed-Strength training and Plyometric training may be imparted to the same group along with some aerobic components to find out the comparative effectiveness.

(ii) The above study may be conducted up between age groups of different sexes to find out the suitability between age and type of training structure.