

CHAPTER – I

INTRODUCTION

Sport is considered as a vital factor of Physical Education, and hence it has a global acceptance. It is unique in the sense that the constant organisation of sports activities and competitions take place across the world. Almost all the countries take part in such activities which is the primary reason for such a wide popularity and importance of sports within the globe. The world has acknowledged the historical presence and applicability of games or sports in all the civilisations. Sports is a worldwide attraction because of the choicest experiences and feelings that are found as an outcome of dramatic emotions like success, failure, exhaustion pain, relief and happiness. It provides human beings with different worldly resources like money, dignity, glory, position and recognition. However, it is equally subject to tragedy, grief, sorrow or death (Uppal, 1992).

Sports and games are a necessary a part of any culture and may be a model read of the society inside that life exists. In critical appraisal of primitive cultures, it absolutely was found that within the non-sport societies that were lesser in range, the life was non-competitive, however, it absolutely was characterised by a lower political activity. However within the structure, culture inside games had exhibited additional competition. During a matter of few decades, sports have gained exceptional quality throughout the world. This quality of sports remains gaining momentum. Sports have become a necessary part of social and culture activities of the trendy world, and it's being given the due place. Sports contribute to the comprehensive development of human temperament and conjointly enhances the frame of awareness among the competitor people. Performance in sports aims at the best performance that the physical and psychological capacities of a sportswoman are worked at with all doable limits. Sports in short are outlined as a competitive activity inside a selected type. It's a system of competitions that has taken its form across the historical periods, primarily within the field of physical culture of evaluating human potential during a composite type (strength), ability and therefore the skills (Singh, 1991).

Presently, sports has become extraordinarily competitive. It's not simply the participation or follow that leads a personal to triumph. Sports are affected through various parts like sports-training, physiology, psychology, sociology, biomechanics

and medical specialty etc. The coaches, trainers, educational personnel's, doctors and physiotherapists are giving their best to spice up the role of the players of the different countries at International Level. Athletes of the many countries are attempting onerous to medals for their nations within the International competitions (Ghuman and Dhillon, 2000).

The performance in sports is a result of the holistic personality of the sportsman. Certain personality features, beliefs and values, motives and interests are crucial for a successful performance in sports. The role of techniques and coordinative abilities is evident. Tactical knowledge of things and tactical abilities are of high importance in every team and combative sports. The physical fitness forms the strong base for the achievement and execution of high level sports performance. Also, the constitutional factors like the body weight, height and breadth, physique, body proportions, and the stability of the muscular-skeletal system play an indispensable role in performing better (Singh, 1991).

The phrase / words 'games and sports' has crossed many milestones, which is a result of multiple achievements in general, and their recognition in the arena of sports in particular. Scientific investigation of sports performance has been playing an important role to reach out to the excellence in different sports activities. The sportsmen have currently become able to provide wonderful performances due to the data of recent scientific coaching strategies and therefore the corroborated ways that of the execution of sports exercise like sports techniques and modules, improvement in sports gears and instrumentation and alternative parts and conditions of the system of sports training (Powell, 1983).

SPORTS TRAINING

Sports training is an important reasonably preparation for a refined performance through exercise. It's ingrained of scientific principles that aim at information and performance improvement. Sports activities are comprised of motor movement and action, whereas their success based upon an enormous extent on however methodologically and properly they're performed. Techniques of sports-raining and improvement of military science potency are of nice importance in an exceedingly training method (Fox, 1984). Training and acquisition or conditioning are the simplest proverbial techniques to organize the athletes / players for a stronger and economical performance, and for a healthy living additionally. Economical performance is

feasible only a rigorously planned programme of standard follow is enforced, that shall excellent the co-ordination, obliterate the needless movements and supply the specified result at the price of minimum energy. It'll conjointly condition the muscle structure and therefore the circulation to endure while not fatigue the intensive demands created upon them (Koubova and Guarente, 2003). Sports training could be a planned programme of exercises designed so as to boost the sporting skills, and to boost the power capabilities of a contestant for a specific game or event.

The word "training" has been a part of language and culture since earlier time. It primarily denotes the tactic of preparation of some task. These processes incessantly bit vary of days and even months and years. The word "Training" is implausibly ordinarily used in sports. There is, however a minor difference amongst sports coaches, which conjointly extends to sports scientists, relating to the dependable which means of this word. Some specialists, managing medicine, essentially defines it as "doing physical exercises". Many terms are utilized in coaching. As an example Strength training, Interval training, technical and basic science training and these terms / phrases mirror this line of thinking (Singh, 1991). Each training schedule produces its own impact on fitness. Training impact may be delineated because the physical changes that occur from a continual participation in an exceedingly fitness programme. Such basic training procedures shall serve higher if used with the modification applicable for the individual or a bunch at question. The simplest coaching or training programme is that the increase in the required quality at a better rate while not inflicting unwanted effects (Bompa, 1999).

Sport training is an organized method that extends over a stipulated period. For best results, the training system must be based mostly and conducted on scientific terms. If the mentioned criterion isn't potential, the coaching has then to be supported the results of winning observe, that has passed the check of your time. Sports training is aimed toward the advance of the performance of sports persons. The sports performance depends on several factors. The performance of an athlete, initial of all, depends on his capability to perform, like speed, strength and endurance. These parts thus are the first aims of physical training. Sport training is really a physical, technical, ethical and intellectual exercise with the assistance of a scientific methodology. It's a scientific method for the athletes and players to realize best-level performance. Training is just like the construction of a multi-storied building.

Many forms of ingredients like intensities and modalities must be used in a very continued method to realize the goals of finished buildings. Looking on the event of the initial construction arrange, the specified mixture of these materials might vary. As a training season moves forward, compressive acquisition work for the strength of endurance can bit by bit kind a transition into focusing on par with a substitution of intensity of volume in decisive the whole load (Bompa, 2000).

Training aims at the advance of fitness of a individual and fostering the acquisition of basic movement skills. Thus, on understand this, coaching or training ought to have some basic principles, the foremost necessary of that's overload. Most Physiological systems are able to adapt to the sensible demands that exceed these workloads generally encountered in routine life. Training usually structurally exposes the chosen physiological systems to intensify the work or performance that exceeds the one there to the system is already tailored. Excessive overload must to be avoided as a consequence of physiological system will not be able to adapt to the acute consistency, for several physiological systems generally demand exposure to overloading activities thrice per week and plenty of. The required frequency of exercise in any case depends on the season, the athlete/player, the sport activity and some specific parts of fitness. Consistency in an exceedingly Training programme cannot be substituted at any worth. The contestant would possibly adopt a training that's very specific to the participation of physiological system overload to the particular muscle group used and to the specific muscle fibers, performing the work progression between the thriving work programme based for a gentle rate of progression over a load quantity. The athlete possesses to reinforce over some years of participation; the training programme must progress that the suitable physiological systems still are overload. However, too fast increase of the training stress could result in exhaustion and impaired performance (Singh, 1984).

Training stimulates physical and physiological changes in the majority systems of the body, significantly at intervals the skeletal muscles and therefore the cardio respiratory system. The changes that result from a specific coaching or training are normally influenced by the frequency, period and particularly by the intensity of the training program. Heredity additionally plays an inevitable role during this method. The end result of the training is particular to the sort of exercises enclosed within the training programme, the muscle groups concerned, and to the sort of

training programme used. The specificity of coaching and exercise has a pair of broad physiological bases, i.e., metabolic and organ. The results of training are lost once some weeks of detraining. Training programme effects, if desired, is maintained with special maintenance programs consisting of one or a 2 days of exercises per week. Previous training programme does not influence the magnitude or rate of gain of coaching effects induced by resultant training program (Fox, 1984). The foremost purpose of the sports programme is to provide metabolic, physiological and psychological adaptation that permits the sportsperson to comprehend high level performance. Once the work or coaching or training job will increase the demand for aerobic energy, the number and size of the muscle mitochondria can increase, therefore as that in these chemical factories, wherever aerobic metabolism takes place becomes larger and additional varied. This might facilitate athletes to additional energy from aerobic metabolism. There are three steps of adaptation: the first involves creating the necessity for added aerobic energy training ought to be enough in every period and intensity to accomplish the specified journey of coaching or training job. The second step is to provide nutrients to form and repair mitochondrial tissues. Third is that the enough time of rest to incline to the subject or respondents to regain the energy as super compensation. There are differing types of training schedule by that one can attain the required development. Each coaching has its own specific effects (Singh, 1991).

BASKETBALL

Basketball is claimed to be the foremost wide compete team game within the world. This sport has evolved an excellent deal within the past years. It had been fancied on 21 December, 1891 by a Canadian Clergyman, James Naismith. The primary hoops was compete at the International Young Men's Christian Association Training School, that is currently referred to as the Springfield college. Naismith fancied basketball as another healthy throughout the winters (Joseph and Wagualls, 1973).

On the opposite hand, the primary baskets that were used for the sport were 2 peach baskets decorated from the balcony of the gymnasium building. Finally in 1913, a hoop together with the net was fictitious in order that the basketball might fall to the bottom freely and clearly. This invention of the ring and net was a significant evolution within the game of basketball. Because of the free-falling ball, the tempo of the sport had redoubled, that allowed the sport of basketball to evolve even a lot

of. Because of the interference of weak spectators within the game of basketball in 1893, the backboard was fictitious. The rule of systematic dribbling in basketball was 1st utilized in 1896, during a basketball at Yale University. But at that point, the dribbler couldn't shoot a field goal. Furthermore in 1895, the penalty free throw was introduced within the game once a player had fouled (Frank, 1970).

By 1932, basketball had formally achieved a global standing with the inspiration of the International Amateur Basketball Federation in Geneva, Switzerland. Basketball was introduced in Olympic games for the first time in 1936. It was held at Berlin. Then forward, the popularity of basketball has been rapidly increasing. Presently, there are around 176 nations which are members of the International Basketball Federation. Basketball has been referred to as the international sports of 1980s. There is no community on the earth whose people (of both sexes) have not been attracted to this game of speedy movement, impeccable accuracy and thrilling. It is watched and enjoyed by enormous crowds fascinated by the athleticism and agility of the giant players. It is a complex blend of team work and individuals skills. It seems flexible enough to exhibit the few moves of personal duels, yet essentially, it remains a team effort. A highly watchable sport with actions that are never obscured. It uses the largest ball in all the team games. Its continuous thrill of attacking appeals to both the player and the spectator who can remain enthusiastic and excited as they support their favourite team (Donald, 1969).

In India, the first national basketball championship was held at New Delhi in 1938, under the auspices of Indian Olympic Association. The Basketball Federation of India came into being after the Second World War. It happened to satisfy the need for supervision and control, of the game at both the state and the national levels. Before 1950, the Indian Olympic Association regulated this game. But after the federation came being in Bombay in 1950, every Indian state practically started forming its own State Basketball Association, which was supposed to be affiliated with the Basketball Federation of India. In 1952, the Basketball Federation of India for the first time took the initiative of organizing a National championship for men and women. The Under 18 boys championship was initiated at Hyderabad, India in 1955. National Championships are now an annual feature, and are conducted in senior, junior, sub junior, mini and youth groups for both the sexes. During the last decade, we have seen a steady increase in the popularity of basketball in India; the emergence of national

championship and various tournaments of different age group levels, and increased media coverage, has resulted in increased opportunities and participation of young players. Popularity of this game has increased in India, but still, we are unable to achieve desired goals at the world level. India's first appearance in international basketball was in the first Asian games held at New Delhi in 1951, and after about 50 years of formation of the Basketball Federation of India, India's highest achievement is third place in Asian Basketball Confederation championship, 1970.

Basketball is without doubt one in all the foremost standard sports that's extensively contends and viewed everywhere the globe. With time, basketball has started involving common techniques of shooting, passing and dribbling, as well as player's positioning in addition as offensive and defensive format. Whereas competitive basketball is meticulously regulated, varied changes and variations of basketball are typically developed for an off-the-cuff game. The cagers are would like typically the power to apace switch forward and backward, with lateral and vertical movements. Now, the question that arises to our minds is: 'how will we have a tendency to enhance the abilities and movements?' It's solely potential through a regulated basic training and a few increased training programs. It's clearly understood that the key to success for every and each game is to become skilful with a lot of basic training versions, so an advancement to tougher ones. Having same that, we are able to infer that a cagers wants sensible fitness, exceptional stamina, high level of flexibility, power, strength, agility, endurance and the next vertical jumping ability to attain sporting targets (Shaji and Isha, 2009). Running, jumping, stopping and pivoting, of these activities impose an oversized quantity of strain on legs and feet muscles. Therefore, it's instructed that a strength programme is crucial in basketball coaching. Power looks to be an imperative consider basketball, since a player must create terribly frequent up and down movements, perennial jumps for shooting, and rebounds etc. Power is additionally important in acting sure techniques of basketball that demand jumping activity like jumper, rebounding, quick breaks. In trendy basketball sport, a player is needed to be unendingly moving to and for a specific period of time, say seventy five to ninety minutes, shifting his pace from slow to quick or medium as per the demand of the sport. Throughout the sport he must take rebounds, dribble, shoot and guard. Modification of directions involves him during

a game strategy. This puts the player below a good deal of demand in terms of motor (Jagger, 1971).

A blend of high speed, regular amendment of direction, explosive lateral movements and exceptionally quick response is what the highest cagers have to become the champion. Therefore, becomes extremely cheap to research the consequences and impacts of speed, agility and quickness training programmes on the performance of cagers. Through continuous and precise repetitions of the SAQ training, the fascicle link between the intention and action is anticipated to become higher and conjointly to provide an economical player who would be ready to react quickly, explosively and effectively, whatever the position at which he plays (Brown and Ferrigno, 2014).

The importance of strength, power, speed, acquisition, flexibility, agility and coordination is quite evident in the game of basketball. Any preparation for game competition therefore must embrace strength exercises, correct acquisition activities, overall stretching movements and thus the learning and active of correct basketball techniques (Brzycki and Brow, 1993). In modern trends of basketball, most teams are accustomed to play a higher speed basketball, and the result depends primarily on speed and quickness. A player without high speed, the ball handling drills and fast break finds it very difficult to excel in the high level competitions. It has become very important to play the game without errors and turnovers (Malik, 2004). The quickness of basketball has its own definition. In precise terms, it is highly important that a player moves quickly and easily on the basketball court. It is a something that demands strength, agility and coordination of an individual so that he becomes able to perform all the movements needed in basketball. The swiftness plays an important role in physical activities (Muckus et al., 2000).

In this regard, weight training and strength training exercises can prove to be of great help. While soccer players are typically seen payment hours within the weight space, cagers typically pay their time perfecting their jump-shot, instead of toning their muscles. Most of the cagers usually neglect strength coaching or training and it proves to be damaging. Obviously, you wish to become ready to place the ball accurately within the hoop; however the advantages of strength coaching for basketball players also are not speculated to be unmarked. The players whose strength training is a smaller amount are susceptible to injury. Players with sensible strength coaching, on the opposite hand, whether are additional seemingly to come back to the court

prior a non-trained contestant. The Strength training builds and strengthen your muscles. Also, it makes your bones denser. Stronger muscles support most vulnerable points i.e. knees and mortise joints, furthermore as wrists and shoulders. A well-designed program can truly improve one's jumping ability by many inches over the course of a coaching season, particularly in athletes who haven't trained extensively before. It'll add muscle that improves a player's talent and talent to manoeuvre with and while not the ball. It ought to additionally embrace elements that stretch muscles and facilitate creating a contestant suppler. Specifically, the simplest and best time to start out this training for season is many months before it truly starts; but, during this a part of the globe, particularly in India, we tend to typically begin the coaching solely some weeks before the particular competition (Das, 2011).

SAQ (SPEED, AGILITY, QUICKNESS) TRAINING

SAQ training is stand for speed, agility and quickness. The game of basketball is a combination of skill, speed, quickness and agility. Players must have the ability to run in different directions, to dribble, pass, catch, jump, and shoot quickly in order to be successful in this game. During men's NCAA Division II game, players can be seen engaging in a number of multidirectional movements that involve running, dribbling, and shuffling at different velocities. During a game of forty minutes, players cover around 4,500 to 5,000 meters (2.8 to 3.1 miles). When dampened for time, fifty seven percent of the sport / game time is spent walking, thirty three percent running, nine percent standing and 1.5 percent jumping (Narazaki et al., 2009).

The positions of basketball can be generally divided into forwards, centers and guards. As far as speed, agility and quickness needs are concerned, the forwards and the centers must have the energy to explode off the ground, to catch rebounds, and subsequently to shoot the ball (offensively) or to pass it to another player. They must have the ability to overcome the imbalance during such performances. Sprints during the game will be relatively short in direction. Athletes are required to pivot, shuffle, and backpedal while playing under the pressure of opposition so that they could execute the required offensive or defensive play successfully. Forwards and centers tend to play a major role in the team, so developing a jump and re-jump ability is of essential importance. Guards also need to develop the ability to explode off the ground in order to either rebound or shoot. Such movement may be followed by a jump, pivot, shuffle, or sprint. Guards play the position where they bring the ball

down the court, which demands regular sprints over a moderate distance while at the same time avoiding the opposition through rapid changes of direction and spins. Speed, agility, and quickness training for the players playing at position of guards should stress more on moderate-distance sprints, rapid cuts, quick changes of direction, jump and re-jump ability, and multidirectional movement (Brown and Ferrigno, 2014).

SPEED

Speed is that the mixed product of 2 factors, i.e., stride length and stride frequency. Increasing either of those 2 factors mechanically will increase the subject's sprinting speed. From coaching or training purpose of opinion, it seems that up the leg strength will increase the stride, length. Although the frequency of the stride is associate inborn equality, it's being potential to enhance it to some extent through training. It conjointly looks that this improvement brings a few corresponding contraction of stride "length. Without becoming upset frequency, time becomes our major concern. Once one cut back the time required to use force at the take-off and minimize / eliminate wasted time within the air, the stride frequency can improve (Eicher, 1975).

Stride length is regulated by the ability the runner puts into the stride, or the bottom contact time. Stride length conjointly has a bearing on the angle of the force to the bottom. Once the athletes over stride or place the landing foot too so much forward of their centre of mass, they produce braking forces that slow them down. Whereas making an attempt to expand their stride by over striding they can really shorten their stride. The simplest doable due to improve the striding capability isn't by ever-changing techniques however rather by enhancing the power to supply power, (i.e., speed and strength). Natural increase in good spirits length happens once a lot of power is applied to the bottom thanks to the enhancements in good spirits frequency. Stride frequency depends on the physiological structure of associate contestant (Rogers, 2000).

Speed of muscle contraction is hereditary but it's deeply improved through training by acceptable techniques and by active speed movements with correct coordination. Speed is deeply laid low with one's age, height, weight, muscle consistency, mechanical and structural choices like length of one's limbs and suppleness of assorted joints. It's thought-about as a very important motor performance think

about most of the physical activities and sports, a lot of thus in basketball, football, swimming, track & field events and volleyball etc.

AGILITY

Agility is typically outlined by the skills and skills necessary to form explosively fast changes in direction and speed. It's a necessary ability for the athletes in any field or athletic game. Agility is usually spoken the 2 distinct kinds of motor perform. It's basic for an explosively begin, smart acceleration, direction-change, and reacceleration whereas sustaining the body manage and minimizing the loss of speed. During this context, agility is critical in athletics as a result of movements are usually initiated from a range of body alignments. Therefore, athletes have to be able to response with additional power and quickness from these alignments in bursts of but ten yards or meters before a modification of direction. Agility also can be spoken the flexibility to synchronize 2 or a lot of sport-specific skills or tasks at the same time, like once a quarterback avoids would-be tacklers once scrambling whereas conjointly wanting down for a football player (Cissik and Barnes, 2011).

The primary key for the advance of agility is to minimize the loss of speed whereas shifting an athlete's centre of gravity. Drills that require speedy changes in direction forward, backward, vertically and laterally can facilitate improve agility in addition as coordination by training/exercise the body to create such changes in movement with a further quickness. Agility programme is additionally the correct to address the CNS system demands of effectively activity sport-specific skills, as a result of it most closely resembles the intensity, time of period and recovery time found in sport performance (Cissik and Barnes, 2011).

Agility program offers a contestant the performance benefits: nerve tissue adaptation, improved energy, avoiding injury, and cut rehabilitation time. A detailed agility program/training will address all completely different elements of agility like strength, power, acceleration, slowing, coordination, balance, and dynamic flexibility. Whereas instructing athletes on the execution of agility exercises, it's essential to fret technique, only if that the speed of movement is to be skilful (Costello and Kries, 1993).

QUICKNESS

Successful performance by a contestant depends heavily on her ability of quick reaction. In sports performance, this sometimes needs the contestant to decelerate swiftly and at the identical time as quickly accelerate, whether or not it involves reacting to a starter's at command of going, the start of a running race, out jumping an opponent for a rebound of basketball, or having the ability to compete an opponent on the football ground. The contestant with a greater quickness and higher interval or reaction time (RT) sometimes maintains a competitive advantage. Speed, rapidity, and instantaneity are the words that are utilized to process quickness. The mentioned terms sit down with the speed of movement of the object, or the measure of the gap it's travelled in a very certain quantity of your time. Once a contestant performs a task or a movement in a comparatively quicker time, it is described as being fast. (Brown and Ferrigno, 2014).

Speed-Agility-Quickness training has become a special and customary method to train the athletes. It's adopted by all quite subjects like college youngsters on an association football field or every kind of professional during a training camp. It can offer sort of edges. This specific methodology has been there during this discipline for many years currently; however it absolutely was not utilized by all athletes, the explanation being lack of education relating to the drills. This training is wont to enhance speed, strength, and the power to exert overriding force throughout ultra-speed movements. Some ingredients of speed, agility, and quickness training include: desired increase in muscular power, overall multi tabular movements, efficiency and potency of brain signals, awareness of proprioception or body abstraction, motor skills and lastly, the response time.

SAQ training is constituted of a complete spectrum of training intensity, from lowest to the highest. Each individual can represent a specific level of training programme; thus, training intensity ought to be in accordance with the individual's capabilities. While low intensity speed, agility, and quickness exercises may even be carried out by anyone for various objectives. SAQ drills can also be undertaken to indicate movements, for warming-up, or for the conditioning of the players. No specific and outright preparation is needed for participation at this level of speed, agility, and quickness training. Drills of higher intensity however demand a certain level of preparation. A basic approach to reliable and safe participation and also with

an increased effectiveness begins with a corresponding strength-training program (Brown and Ferrigno, 2005).

Speed – agility - quickness (SAQ) training is constituted of various body movements like sprint, shuffling, jumping, flip-direction etc. Since jumping is an additional component of speed, agility and quickness training programme, so plyometric coaching may be a part of the same. Plyometric training positively improves an individual's performance through a six-week intervention. (Miller et al., 2006).

Those who connected and concerned within the development of SAQ programmer have desired to fill this void thus on develop every and each type of speed, notably for team sports like basketball. SAQ programmers seek declaration of speed down into 3 major areas of skill: speed, agility and quickness. There for one might notice them to be quite similar, they're not so; of course, they're completely different in terms of however they're incorporated, developed and integrated into an individual's performance. Once these skills are absolutely combined and also the SAQ instrumentation is utilized, they assist the coach with the required tools to transform a decent player into a extraordinary one. Its value noticing and appreciating what players can really bring with an SAQ programmer (Pearson, 2001).

Changing speed and direction collectively demands that the muscles shorten in elastically or in a passing reactive manner, directly once continuance. Due to this, most of the speed, lightness and quickness drills are thought of as single leg plyometric compound movements with horizontal stress. Therefore, reactive styles of single leg movements ought to be extra and extra addressed in conjunction with important resistance training and testing (Brown and Ferrigno, 2014).

STRENGTH TRAINING

Resistance training is an anaerobic type of exercise. This specific training programme may be wont to improve the ability of the body to perform at very high level of force and execute power outputs for a short period of time or to boost the ability of the body to perform repeated bouts of top activity. Resistance training has to be an indispensable component of all fitness programmes; particularly for strength and power to athletes rather than to the individuals who exercise for routine health benefits. It is obvious that athletes in sports who require strength and power, such as weight lifting, bodybuilding and sprinting must go through resistance training.

However, many other athletes benefit from strength training, particularly those in sports that require a high level of muscular endurance (Kumar, 2004).

An essential of weight training (Strength training), its regularity and the gradual increase in training intensity (principles of over loading) is to be followed by good nutrition and sufficient rest. Unlike endurance training, weight training does not demand to spend more calories. As such, its role as far as reducing body weight is concerned is limited; however, it reduces weight due to muscle hypertrophy. Strength training does not imply that one shall lose flexibility or become muscle bound. Studies on Olympic athletes have proved that only the gymnasts have better flexibility than the weight lifters. Weight training does not slow down muscular movement. Moreover, it has also been established that rise in muscular speed (Explosive Power) accompanies a hype in muscular strength (Fox, 1989). Muscle strength, which is the strength of a muscle or muscle group, is the maximum force that is generated as a specific velocity. On the opposite hand, native muscular endurance is that the ability of a muscle or cluster muscles for an eternal contraction with multiple repetitions. An applicable load to stimulate strength development in a very resistance educational program typically depends on the individual's coaching standing. This is specifically pertinent for beginning lifters, whereby loads of at least 45 to 50 percent of IRM are needed in order to increase dynamic muscular strength (Baechle and Earle, 2000). As time passes, greater loads are required. To stimulate muscle cell hypertrophy and strength development, a resistance of approximately 80percent of IRM is suggested. When muscular endurance is the primary motive of the training, resistance of less than 80 percent at maximum is required. The amount of resistance that weak and elderly adults in their 90s can tolerate is at least 80percent of IRM. However, it was found that progression with lighter resistances (50-60 percent of IRM) for old women might result in greater increase in strength. The resistance needs to be carefully evaluated in order to avoid injury or stimulated pain from unsuitable overload (Hunter and Treuth, 1995).

The sequential order of strength training exercises is critical because of two reasons. First, the larger muscle group should be exercised before the smaller ones, because overloading the large muscles is difficult since the smaller muscle groups fire more quickly. Secondly, no two physical exercises should train the same group of muscles consecutively, for the muscles will have a very little recovery time. Beginning of

weights may be based on the percentage of either the athlete's body weight or his or her optimal performance in each exercise. Strength training stresses either the body development (Hypertrophy) or the strength, it depends on the weight and number of repetitions of exercises (Bowerman and Freeman, 1991).

Strength is probably the foremost vital motor ability in sports, as all movements in sports is usually caused by muscle shortening. Consequently, it might not be incorrect to say that strength is a part and parcel of all-motor talents, technical skills and plan of actions. The enhancement of strength has almost been the biggest factor to improve performance in sports. It is the utilizable strength that is the key component, the strength which can be used through the body to make it faster, quicker, and to change the direction of the body movement, put a greater amount energy into a cricket bat or racket head, or make the pull on an oar faster and longer. Weight training and other forms of resistance exercises (using gadgets other than barbells and weight plates) are pertinent means of developing various forms of strength. The intensity, density, duration and repetitions have to be regulated in a way that exercises contribute to enhancement of different types of strength. For resistance exercises, movements can be performed against one's own body weight, weight of the partner, and even weight jackets, wrist and ankle collars can be used to increase resistance. Medicine ball exercises, rubber cables exercises and different forms of partner exercises can be performed to improve strength (Uppal, 2013).

All physical activities lead to anatomical, physiological, bio-chemical and psychological changes in a body. The potency and efficacy of a physical activity could be the result of its period, distance, frequency, repetitions, load and rate (intensity). While regulating the dynamics of training, the mentioned aspects and other variables of training are worth a keen observation. All these variables are to be designed in keeping with the purposeful and psychological specificities of the individual competition. Throughout all the training phases that are undertaken before the selected competition, the trainer must stress explicit parts to attain the specified objective. As a rule, intensity ought to be stressed for sports of speed, power and volume, as well as conjointly for endurance sports. Finally, for sports that demand tortuous skills, training quality is must (Bompa, 1999).

MOTOR FITNESS

Motor Fitness is outlined as the potency of basic movements complimentary to the Physical Fitness. The coaches commonly use this word synonymously with physical fitness; however, it is relevant for the students of physical education to distinguish the two, i.e. the fundamental difference between physical fitness and motor fitness. Physical fitness denotes the basic fitness components that are five in number – muscular strength, muscular endurance, cardiovascular endurance, freedom from obesity and flexibility, motor fitness, on the other hand, is a wider term that includes all the ten fitness components which are, speed, balance, muscular power, coordinative ability etc. These are additional five motor performance components important mainly for success in sports. Modern sports has become more scientific. The players are breaking previous records and creating new ones in today's competitive sports. The standards of physical fitness and skill ability are going upwards because of the advancement of science and technology (Uppal, 1992).

A physically fit person leads a happy and meaningful life in our society and with a fit body, a person becomes capable of doing his physical work without fatigue. The term motor fitness is defined as a readiness for performance with special relation to the big muscular activity without unnecessary fatigue. It indicates the capacity of an individual to perform more efficiently, to work with strength and force over a given period of time. Motor fitness, even though it is not concerned with specific skills, includes those components which contribute to the overall performance in motor activities. Motor fitness is the essential ability to perform the large muscle movements effectively and to exhibit more endurance under sustained efforts and demanding situations (Cureton, 1947). Motor fitness is defined as the readiness or vigilance for performance with special demand for big muscle activity without unnecessary fatigue. It also includes the ability of an individual to move efficiently with strength and force for a reasonable period of time". Motor fitness is the ability to perform basic motor skills efficiently. It involves such elements as power, agility, speed and balance". Motor fitness, though not concerned with specific skills, involves those components which contribute to gross performance in motor activities. Essentially motor fitness is the ability to perform the large muscle movement efficiently and exhibit endurance under sustained effort in various situations (Johnson and Nelson, 1982).

Motor fitness can be referred to as the efficient performance in such basic actions as running, jumping, dodging, falling, climbing, swimming with sustained efforts and energy in many possible situations. And therefore, it would involve such components as power agility, speed and balance (Bookwalter, 1952). According to the American Association for Health, Physical Education and Recreation (1965), motor fitness is that state which stands for the degree to which a person is capable of functioning efficiently. Keeping all the components of motor fitness in mind, it is also connected with some personal factors of human body such as maturity, size, physique etc. These factors indicate the movement of a human body and become motor fitness. It is also referred to as the motor behaviour, a term sometime used for general sports or athletic ability. Motor ability and motor fitness of a person have been defined as the acquired and innate motor ability for the performance of a skill of both general and specific nature. It excludes highly specialized sporting activities.

The motor components are related to the development and performance of gross motor skills. Since early eighties, the excellence between health connected and performance connected shape has become plainly common. At that point, health related fitness was thought-about as a state characterised by an easy ability to perform routine activities with energy, traits and options that are connected to the low risk of premature symptoms of the hypo-kinetic diseases (those related to physical inactivity). It includes cardio metastasis fitness, muscular strength, flexibility and body composition (Gaston, 2009).

SKILL PERFORMANCE

Basketball players are essentially supposed to have skilfulness, change of speed, an acute sense of direction, accurate passing ability, and quick rebounding ability. The shot must be carried out with the ball with proper handling. In order to achieve this, a high degree of motor abilities like, strength, anaerobic and aerobic endurance, agility, speed of movement, reaction time, explosive power, flexibility etc. are the essential qualities. These should be developed by all basketball players. The basketball game requires highly skilled players with a refined physical conditioning and maximum training. Nowadays, basketball players put themselves under rigorous training programs in order to meet the demands of the game (Moontsir, 1978).

Apart from the evaluations that are mentioned above, motor fitness/motor skill is an equally important factor in basketball playing ability. Each aspect of skill

development is deeply related to the fulfilment of specific tactical tasks that are demanded by the game. Performance in basketball essentially demands a high degree of skill proficiency in the acts of passing, shooting, dribbling, rebounding etc. It would not be incorrect to say that these skills are the soul of the game from all points of view, technical, tactical and strategically (Malik, 2004).

One of the loveliest pleasures in sports is the showcasing of performance at its topmost level. There is something aesthetic about an athletic who is beyond the ordinary, and demonstrates extraordinary speed and control while giving the performance. Reaching the highest level requires skill equipment, mental strength, years of aimed practice and devotion towards the same. Successful performance of a skill in big competitions usually depends deeply on the efficiency to utilize high levels of strength as quickly and explosively as possible. There are team sports that additionally need high levels of explosive power, like volleyball, basketball, netball, rugby football and handball. Earlier the relationship of power with sports performances has been the subject of research, however, within the last decade researchers have complete the importance of training for power in all varieties of sports activities. To give one's very best in basketball, one has to build the skill of appropriate passing, dribbling and shooting, other defensive skills, individual tactics, offensive and defensive combination. However, it is a general assumption that a higher percentage of fast-twitch muscle fibers great speed or strength is an inborn gift, before these elements are trained and mastered into skills.

PHYSIOLOGICAL VARIABLES

Physiology is that the systematic study of the functions and functioning of the standard figure. It's closely connected with the scientific study of all living beings among the topic of biology, with the chemical reactions among the body, the behavior of body cells below entirely totally different conditions in organic or bio chemistry and jointly with physics among the systematic study of the physical reactions and movements that happen among the body (Pearce, 1993).

Exercise physiology can be defined as the scientific study of the physiological changes in the body of the athletes that come as a result of exercise. They can be long term or short term depending on the mode of exercise and the desired changes. In order to develop specific physiological systems of the body or to make them fit, they must function specifically in order to support a particular game. Different games have

different demands, which are related to an organism's neurological, respiratory, circulatory and temperature (Clarke and Clarke, 1987).

In physiology, one can learn the way the organs, systems, tissues, cells and molecules among cells perform, and the way the functions of these biological components are placed along to take care of and regulate the interior atmosphere. Physiology is that science that deals with the study and analysis of however anatomy functions. Exercise physiology is that the extended study of however the structures of body and its functions amendment as a result of physical exertion. It implements the thought of exercise physiology to coach the jock and therefore the actual sweetening in an athlete's sports performance (Singh et al., 2008).

Human physiology is that the pillar within the house of the mechanical, physical and organic or bio chemistry functions of humans who are in physiological condition, and it conjointly considers itself with their organs and therefore the cells of that they're composed. The foremost focus of physiology is at the standing of organs and systems. Many have provided the functions of physiological knowledge (Lawrence et al., 1971).

With specific training and conditioning, the heart becomes more efficient in its functioning, and becomes able to circulate larger amount of blood while beating less frequently. For a standard amount of work the heart becomes slower as training progresses. These changes in heart rate indicate a decreasing load on the cardiovascular adaptation to exercise. Blood pressure is also regulated through training. Sustained efforts with the untrained subjects lead to progressive fall of the systolic pressure which indicates approaching exhaustion.

The progress of a sportsman thus on alter him to attain high standards of performance is typically centred in four, i.e., physical artistry, social adjustment, psychological development and physiological potency. So as to create the physiological systems of the body work, they need to function fine enough to sustain a selected activity that's performed. Totally different activities create different demands upon the pagan religion or paganism with reference to circulatory, metastasis or respiratory, metabolic, medical specialty and temperature regulation functions. Therefore, physiological fitness varies with every explicit activity. Physiological systems are extremely labile to exercise. Every task includes its major physiological parts, and fitness for

these tasks needs correct functioning of the suitable systems. To run fast and cover ever-increasing distance, certain changes in physiological functions will become necessary, so that the exercise capacity of the subject can be enhanced (Uppal, 1982).

STATEMENT OF THE PROBLEM

The problem had been stated as *“Effects of SAQ, Strength and Combination of Both Training on Selected Physiological, Motor Fitness Variables and Skill Performance of Basketball Players”*.

OBJECTIVES OF THE STUDY

1. To find out the effects of SAQ training on physiological variables like Resting pulse rate, Systolic Blood Pressure, Diastolic Blood Pressure, Resting Respiratory rate, Peak Expiratory flow rate among basketball players.
2. To draw out the effects of SAQ training on motor fitness variables like Speed, Strength, Co-ordination, Flexibility, Endurance among basketball players.
3. To examine the effects of SAQ training on skill performance variables among basketball players.
4. To assess the effects of strength training on physiological variables like Resting Pulse rate, Systolic Blood Pressure, Diastolic Blood Pressure, Resting Respiratory Rate, Peak Expiratory flow rate among basketball players.
5. To ascertain the effects of strength training on motor fitness variables like Speed, Strength, Co-ordination, Flexibility, Endurance among basketball players.
6. To examine the effects of strength training on skill performance variables among basketball players.
7. To find out the effects of combine SAQ and strength training on physiological variables like Resting pulse Rate, Systolic Blood Pressure, Diastolic Blood Pressure, Resting Respiratory Rate, Peak Expiratory flow rate among basketball players.
8. To draw out the effects of combine SAQ and strength training on motor fitness variables like Speed, Strength, Co-ordination, Flexibility, Endurance among basketball players.
9. To examine the effects of combine SAQ and strength training on skill performance variables among basketball players.

HYPOTHESES OF THE STUDY

On the premise of literature reviewed and scholar's own understanding of the matter, the subsequent analysis hypotheses were developed.

1. There would be significant effects of SAQ training on physiological variables among basketball players.
2. There would be significant effects of SAQ training on motor fitness variables among basketball players.
3. There would be significant effects of SAQ training on skill performance variables among basketball players.
4. There would be significant effects of Strength training on physiological variables among basketball players.
5. There would be significant effects of Strength training on motor fitness variables among basketball players.
6. There would be significant effects of Strength training on skill performance variables among basketball players.
7. There would be significant effects of combine SAQ and Strength training on physiological variables among basketball players.
8. There would be significant effects of combine SAQ and Strength training on motor fitness variables among basketball players.
9. There would be significant effects of combine SAQ and Strength training on skill performance variables among basketball players.

DELIMITATIONS OF THE STUDY

The study was delimited to following points:

1. The study was delimited to the basketball male players only.
2. The study was further delimited to Union Territory Chandigarh only.
3. The study was delimited to twelve weeks of experimental period.
4. The study was delimited to the players participating in the state level tournament of Union Territory Chandigarh.
5. The age of the subjects ranged from 15 to 18 years were chosen.
6. The study was delimited to two schools of Union Territory Chandigarh, The New Public School, Sector-18 and Sri Guru Harkrishan Model School Sector-38.

LIMITATION OF THE STUDY

The present study was contained some un-controlled factor like climate condition, individual behavior towards training and test. The diet and routine of the subjects cannot be controlled.

DEFINITION / EXPLANATIONS OF THE TERMS

SAQ (speed, agility and quickness)

The SAQ training method is conducted with developmental exercise to develop and enhance the ability of an athlete to become additional skilful at quicker speeds and with accuracy and precision. SAQ training/programme allows the athletes to become higher at reacting to the stimuli, begin more swiftly and efficiently, move quickly and effectively in several directions. (Polman et al., 2009)

STRENGTH TRAINING

Strength training considers resistance training as an exercise programme where free or stationary weight is needed for the purpose of increasing muscular strength. (Bompa, 1999)

TRAINING

Training is a methodical process of repetitive elevating or progressive exercise / workout involving the learning process and acclimatization. (David, 1987)

RESTING PULSE RATE

Pulse rate is actually the frequency of pressure waves (waves per minute) propagated along the peripheral arteries such as the carotid or radial arteries. (Abstrand et al., 1970)

BLOOD PRESSURE

The pressure measured in the vascular system that's related to cardiac contraction (systolic) and relaxation (diastolic). (Lawrence et al., 1976)

SYSTOLIC BLOOD PRESSURE

The highest level to which the arterial blood pressure rises during the systolic ejection of blood from the ventricle.(Lawrence et al., 1976)

DIASTOLIC BLOOD PRESSURE

Diastolic pressure is that lowest arterial blood pressure of the cardiac cycle occurring during diastolic of the heart. **(Govin & Johmson, 1985)**

RESTING RESPIRATORY RATE

Number of breaths taken per minute or the number of inspiration/expiration per minute. **(Fox et al., 1989)**

PEAK EXPIRATORY FLOW RATE

Peak Breath Flow or Expiratory Flow Rate is that the most flow generated throughout a forced breath manoeuvre. It's thus a test measuring the utmost mid-expiratory flow, usually obtained throughout the tenth of second following a forced expiration from respiratory organ or Lung capability. **(Cantani, 2008)**

MOTOR FITNESS

Motor Fitness is the ability of an individual to perform efficiently the basic motor skills involving such elements as power, agility, speed and balance. **(Johnson & Nelson, 1982)**

SPEED

Speed is the ability to execute motor action under given conditions in the minimum possible time. **(Singh, 1984)**

STRENGTH

Strength is the force that a muscle or group of muscle will exert against resistance during a singular maximal effort. **(Mathew & Fox, 1976)**

AGILITY

Agility can be defined as the ability to make movements and shift directions quickly and to have a control over body movements. **(Robert, 1973)**

FLEXIBILITY

Flexibility is the range of movement in a joint. **(Barrow & McGee, 1979)**

ENDURANCE

Endurance is the ability to perform sporting movements of desired quality and speed under the condition of fatigue. **(Singh, 1991)**

BASKETBALL

Basketball is a team sport wherein two teams of five players each attempt to score points by throwing or "shooting" the ball into a basketball hoop while simultaneously following a set of rules. Basketball is one of the world's most popular and widely viewed sports.

SKILL

Skill is the element of performance which enables the performer to accomplish a large amount of work with a relatively small amount of effort. **(Lawrence et al., 1963)**

PERFORMANCE

Performance is the behavior through which an organism engages in or respond to a task or activity. It leads to a result, which modifies the environment in one way or the other. **(Wolman, 1973)**

PASSING

A pass is an act of shifting the ball between players. Passes are mostly accompanied by a step forward in order to increase the power. They are followed through the hands so as to ensure accuracy.

SHOOTING

Shooting is the attempted act of scoring the point. It follows the throwing of the ball in the basket. The methods of shooting can vary with players and situations.

DRIBBLING

Bouncing the ball continue with one hand is called dribbling. It's necessary for a player to require steps together with the ball. A player during dribble pushes the ball down towards the court by using the force of his fingertips instead of patting it. It's done to make sure greater control.

SIGNIFICANCE OF THIS STUDY

The present research will throw some light on the positive effects and improvement of SAQ and Strength trainings on the selected physiology, motor fitness and skill performance variables of higher school basketball players. The primary motive of the study aims at improving basketball skills of the age group of 15-18 years. The study will also give directions to the coaches of different sports, teachers of physical education and physiologists for designing their training programme as per the findings of this research. The project will also provide an introspective space to the players. It will be an insight to the coaches, trainers and selectors in the sense that they will consider physiological, motor fitness and skill performance variables while making the selections. The study will further provide an additional knowledge particularly for the training of basketball players.
