CHAPTER I
INTRODUCTION

The youth of our country is most precious assets and is the backbone of the future. This generation must be very healthy in all respect. All the experts related to the field of sports and fitness having main emphasize on this segment of population. Unfortunately this segment of our country population is in the grip of unemployment, physically inactive in the field of sports. There are so many reasons e.g. lack of facilities, interest, guidance, motivation etc. Some of them are developing chronic disease in young age. This is clearly proved that physical activities during childhood or in adolescent age prepare a solid foundation for whole life.

Kumar et.al. (2012), told about the health and fitness. The quality life of an individual is measured not by the length of life alone but mainly on how an individual is possessed with better vigour and health to save him and the society best. This health related physiological and motor fitness, which is considered as a key component in an individual’s life, is developed and protected through participation in various physical activities. This physical activity may be by means of direct involvement in various kinds of activities, or else though leading active life style. Though there is no consensus on the concept of active lifestyle, physical educationists all over the world are trying to find out various means and methods to protect the health of individuals through different physical activities including various levels of training. Excess bodyweight and childhood obesity has recently being identified in the youth of urban population. There is a big need to understand this pandemic, by this way we can reverse this dangerous and harmful trend among them. The regular exercises produced enough benefits to them, while some experts recommend aerobic exercises. Some of the experts have identified that strength training is a very effective & essential part of conditioning in youth. “Who regularly
participate in physical activities that enhance muscular strength endurance and flexibility (U.S. Deptt. of Health & Human Services) 1996”.

Physical Educators understand the scientific foundation for what they do today is better than what they did years ago. They no longer conduct exercises and physical activities simply for the purpose of entertainment or to stimulate muscular activity for its own sake. Today they are interested in providing exercises and physical activities that will accomplish specific objectives for participant such as helping a handicapped person to have a sense of accomplishment in physical activity to enhance his or her self-concept or assisting an industrial executive in determining his or her state of fitness through sophisticated measurement techniques. The physical education is also utilizing computer technology to store information that will be readily available for instant retrieval and application in their filed. Fox Edward,(1984) defined physical training as “A programme of exercise designed to improve skills and increase energy capacities, for an athlete, the preparation for a particular event”.

Masironi and Devolin, (1985) said physical activity play very important role in prevention and treatment of various diseases. Twenty first century has witnessed a land mark development in science and technology including space, defence, atomic energy, computer, internet service etc. By the internet invention we can collect required information within a fraction of second from any part of world. Due to this advanced scientific technological invention, the body movements of human beings have been restricted and tension and competitive feeling increased. It is felt that the man has been felt the prey of stress, hypo kinetic and psychosomatic diseases. So time has come that man should not ignore the importance of any physical activities. Every one desires good health and it is the ultimate objective of all those who want happiness in life. Everyone has to follow good health practices in their routine life. Minor health disorders are quite common to all. In the case of major health problems, the precautionary measures are plenty. Some people control their
diseases like blood pressure, diabetes, acidity, asthma etc. by taking medicines regularly. But such practice does not in a way completely eliminate the health disorders; on the other hand it leads to several other adverse health problems. The evaluation of the effectiveness of strength training programs in youth. The maximum focus should be on to develop strength safely. This study should also attach with the aggression & adjustment in behaviour of them in the society for better relationship.

Bompa and Carrera, (2006) told about Periodization in sports training to achieve the high level performance. Right from the first modern Olympic Games, human performance has captured the attention of the total world. After that there is special awareness among coaches and investigators as well as the sportspersons. To meet the challenges of modern sports so many research laboratories have been setup to help the sports activities. Whether there can be an end to human efficiency relating to his or her performance in sports. A high-level performance is the result of years of intense training, methodical and well planned. All along this period, the athlete tries to adapt his body functions to the specific requirements of the sport he had chosen. The adaptation level is reflected in the performance capacities. Higher the degree of adaptation, better the performance and systematic physical activities play vital role in this.

1.1 Physical Activity

Health Report of U.S. Department (1996) defines Physical Activity and fitness. Physical activity is defined as bodily movement produced by the contraction of skeletal muscle that increases energy expenditure above the basal level. Because muscle contraction has both mechanical and metabolic properties, it can be classified by either property. This situation has caused some confusion. Typically, mechanical classification stresses whether the muscle contraction produces movement of the limb: isometric (same length) or static exercise if there is no movement of the limb, or isotonic (same tension) or dynamic exercise if there is movement of the limb. Metabolic classification involves the availability of oxygen for the contraction process and includes
aerobic (oxygen available) or anaerobic (oxygen unavailable) processes. Whether an activity is aerobic or anaerobic depends primarily on its intensity. Most activities involve both static and dynamic contractions and aerobic and anaerobic metabolism. Thus, activities tend to be classified according to their dominant features. Exercise and physical activity have been used synonymously in the past, but more recently, exercise has been used to denote a subcategory of physical activity: “physical activity that is planned, structured, repetitive, and purposive in the sense that improvement or maintenance of one or more components of physical fitness is the objective”

Exercise training also has denoted physical activity performed for the sole purpose of enhancing physical fitness (Caspersen Powell, et al. (1985).

1.2 Physical fitness

Park, (1989) defined physical fitness “A generally accepted approach is to define physical fitness as the ability to carry out daily tasks with vigour and alertness, without undue fatigue, and with ample energy to enjoy leisure-time pursuits and to meet unforeseen emergencies”. Physical fitness thus includes cardio respiratory endurance, skeletal muscular endurance, skeletal muscular strength, skeletal muscular power, speed, flexibility, agility, balance, reaction time, and body composition. Because these attributes differ in their importance to athletic performance versus health, a distinction has been made between performance-related fitness and health-related fitness. Health-related fitness has been said to include cardio respiratory fitness, muscular strength and endurance, body composition, and flexibility. The relative importance of any one attribute depends on the particular performance or health goal.

Singh, (1984) said sports can improve the components of fitness namely: Strength, speed, endurance, flexibility and suppleness. Strength, the ability to exert muscular force is a component of physical fitness and has been of interest since antiquity and many account of super human quality to lift stupendous weight have been recorded. The scientific principles of increasing the load of resistance against which muscles work that strength increases has
been called progressive exercise and has been employed extensively in modern times by individuals interested in strength development and athletic performance. By the use of modern technology, everyday records are being shattered in various events. Training in Games and Sports is taking new trends to meet the challenges of the modern time. Various experts are very eager to understand the various factors affecting muscular activities during human movements.

**Washington, DC, (1971)** reported that Physical Fitness has different physical activities, which is related to the movements that people perform; physical fitness is a set of attributes that people have or achieve. Being physically fit has been defined as "the ability to carry out daily tasks with vigour and alertness, without undue fatigue and with ample energy to enjoy leisure-time pursuits and to meet unforeseen emergencies.

**Public health report U.S.A (1985)** categorised the health-related components of physical fitness which are (a) cardio respiratory endurance, (b) muscular endurance, (c) muscular strength, (d) body composition, and (e) flexibility.

### 1.3 Fitness components

**Edward et.al. (1997)** defined, this is a set of attributes that people have or achieve relating to their ability to perform physical activities. Components of fitness are cardio respiratory function relative leanness, muscular strength, endurance and flexibility.

- **Cardio respiratory function**- The ability of the circulatory and respiratory system to supply fuel during sustained physical activity.
- **Relative leanness**- the relative amount of body weight i.e. fat and non fat also called body composition.
- **Muscular strength**- The ability of the muscle to generate the maximum amount of force.
• **Muscular endurance**- The ability of the muscle to perform repetitive contraction over a prolonged period of time.

• **Flexibility**- The ability to move a joint through the full range of motion without discomfort or pain.

• ** Explosive Power Defined**

“Explosive power is defined as the ability of a muscle or a group of muscles to release maximum force in shortest possible time in an explosive manner, projecting the body or an object.”

Training in games and sports is no longer a myth and it does not appreciate casual approach, but it provides opportunities for scientific application and verification. Training has been accepted as a high specialized science. Physical education scientists are striving to understand the various factors affecting skeletal and muscular activity during a variety of human movements. They are consistently studying factors likes’ strength, speed and endurance, agility, socio-economic status. Making that initial decision to start training is the most important step to achieving the physique you desire. This chapter explains why strength training is so good for you-not just for the sake of your appearance but also for your health-and in case you had any doubts about the benefits of this type of exercise, it sets the record straight on some popular myths and misconceptions, this chapter also deals with the practicalities of whether to train at home or at a gym, and gives you a useful checklist on choosing a gym to suit your needs, if you are wondering whether to use free weights or mechanism this chapter weighs or machines, this chapter weighs up the pros and cons and give you the scientifically proven facts on each method of training. Finally, it gives you practical pointers on workout accessories, such as belts and straps. In the 1990s, the importance of physical activities achieved widespread acceptance by the public, professional organizations, and the medical community. It seems that almost everyone recognizes the overwhelming evidence, accumulated by exercise scientists over the past 5 decades.
So many Researches are going on in the field of strength training in the every sports as per the need of respective event. Throughout the world there is a need to introduce new methods or alternate modes of strength training to fulfil the objective of this component. By this way there is a possibility to create of awareness among maximum population of youth. It is well known fact that traditional strength programme for youth can produce desirable results such as strength and strength endurance. Sometime traditional methods are not the choice of youth, at that time there is need to introduce to new methods in this field to meet the challenge of the present time. There is a need to make alternate methods of resistance training. There is a need to adapt non traditional forms of strength training for e.g. weightlifting, power lifting, body building, strength training, pliometric, functional strength training etc.

And power lifters and weight lifters are found the various effects of weight lifting and power lifting training on health related fitness programme in relation to their socio-economic status. Physical activities have very important place in the modern world which are not necessary only for sports these are also essential for health and fitness for our population. These help to keep our generation feet and healthy and provided the safety from various types of health related problems. As for as sports is concern these activity play a very vital role. The modern sports are full of glamour, money and recognition of individual as well as for various countries and societies. In the present scenario, the countries which are economically strong are the leader of the sports. The citizens of those countries are living in the better healthy life. They set the guidelines for rest of the world. They have invested huge amount to develop root level facilities in there societies for this purpose. So many research works is going on in the modern labs with the help of latest technology. Modern fitness world is governed by the scientific innovations, simultaneously they care about the food, training, healthy and hygienic condition at root level. In our country we have to understand about these needs for betterment of our population.
Wuest and Bucher, (1991) concluded. Strength is one of the most important components of physical fitness which affects the performance in all activities in some form or the other. This is very essential for power and speed, particularly in weight lifting and power lifting is very much required to the extreme limit of our body. The training of these events is very essential for various sports activities to generate strength in the body by doing various types of weight training exercises.

Motor Fitness is a present aptitude for physical skills, includes strength and co-ordination enriches today’s Manpower in players performance.

- **Speed**: Speed is the ability to execute motor action under given conditions in minimum possible time.

- **Endurance**: Endurance is the resistance ability against fatigue or endurance is the ability of athlete to overcome the resistance under condition of fatigue.

- **Strength**: Strength is the ability of athlete to overcome the resistance and to act against it.

- **Agility**: According to Jensen and Fisher (1972) "Agility may be thought of as the ability to shift direction of body and its parts quickly. It represents a combination of strength, speed and reacting and moving, power and coordination.

- **Flexibility**: Flexibility is the ability to execute movement with greater amplitude.

- **Power**: It is the ability to release force at a specific movement, involves path, speed of contraction and strength of muscle. Speed and strength must be combined in order to produce power.

- **Balance**: An even distribution of weight enabling someone or something to remain upright and steady.

1.4 **Weight Training**

Weight training is today considered as very significant method of securing strength, which requires the advance training under the guidance of
experts. In the modern trends of general fitness program 25-30 minutes of strength training coupled with aerobic exercise plus 5-10 minutes of stretching for the balanced work out. When we do weight training regularly with the balanced intake, various systems of the body change in positive ways. Muscles become stronger, better toned and show less fatigue during training. The neuromuscular system works properly.

Antonio and Antonio (2015) connected SES with weight training. The rapid socio-economic and demographic mutations, the need to benefit from the natural dimension has led to a diversification of the application of physical exercise/sport that today it presents itself with different objectives and with the research of different forms of satisfaction. Weight training is a common type of strength training for developing the strength and size of skeletal muscles. It utilizes the force of gravity in the form of weighted bars, dumbbells or weight stacks in order to oppose the force generated by muscle through concentric or eccentric contraction. Weight training uses a variety of specialized equipment to target specific muscle groups and types of movement. Sports where strength training is central are bodybuilding, weightlifting, power lifting and strongman, highland games, shot put, discus throw, and javelin throw. Many other sports use strength training as part of their training regimen, notably; mixed martial arts, American football, wrestling, rugby football, track and yield, throwing, lacrosse, basketball, baseball and hockey. Strength training for other sports and physical activities is becoming increasingly popular. Every athlete’s capacity and ability to create and apply powerful muscular contractions against the resistance is base of his or her sports success. In this process an individual have to increase the ability of muscles to generate maximum power for high level sport performance for this all athletes commonly utilize resistance training as per the demand of their sports activities. However, many athletes , coaches experts and sports scientist misinterpret the physiological adaptations from the weight training which leads towards improvements in generating force and power output. The main
established thoughts are that the routine practice of resistance exercises that leads to sure increase in the sports performance. As the movements are powerful, fast, and volatile this will make an athlete similarly powerful, fast, and explosive in their particular sport event. Because of this accepted belief that the velocity of resistance training is directly related with the desired increases in force output and power generation during the sports activities, most of the athletes use high-velocity resistance training, which is known as Olympic style weight lifting instead of other methods of resistance training. Despite the enormous popularity of Olympic lifts in various athletic events or in other sports activities where strength and speed dominate the event, this theory is accepted worldwide. There are so many physiological changes takes place in such resistance training. However, the reason about this not clear why the Olympic lifts allow the body to produce such

1.5 Definition of Weight Training

“Weight Training is concerned with improving the conditions of the body in terms of strength, power and endurance, through the use of resistive movements or attempted movements in the case is isometric exercises against a resisting load of some kind.” Man has exercised with weights for almost two thousand years, mostly using crude dumbbells or sandbags. Now we have disc loading system and this system of physical training has accepted worldwide today for betterment of human being. We have developed modern weight equipments i.e. multi-gym and isokinetic machines to train to specific group of muscles. Weight training has its best effect when the exercises are done for long time with proper schedule and diet.

1.6 Definitions of Weightlifting

Kirkley (1985) write about Weightlifting, that it has a "generic" meaning which refers to the activity of lifting weights. To those who are well versed in the use of weights, the word weightlifting has a particular meaning. It refers to the Olympic sport of Weightlifting, which tests strength a power through two methods of lifting a barbell overhead (the Snatch and the Clean
and Jerk). Weightlifting is the only Olympic sport involving weights, which is why it is sometimes referred to as Olympic lifting or as Olympic-style lifting, or Olympic-style weightlifting.

There are various exercise which are very essential to increase the performance of this game by the athletes. The iron is used to make the Barbell is of very high grade. plenty of exercises you can do with one barbell by loading different weight plates ,but we should use equal weight plates on the side of it to get the maximum balance of the weight loaded during training or during lift. Most of the exercises can be done with the help of different dumbbells too. There is some non definite list of weight lifting exercises as given below

1. **Squat.** This is very important exercise to develop the leg strength, this component is very essential in this game and should be the part of any routine strength exercise. This exercise also increase the load bearing capacity of spinal cord also strengthen the lumber portion of the back. These exercises strengthen the quadriceps muscles and hamstring muscle groups of our lower limb. there are so many types of squats used to develop the strength of legs as given below.

   **Front Squats.** This type of Squats are done by keeping the loaded bar on the front shoulders instead of on the back. This exercise strengthen the quadriceps muscles and supplementary exercise of clean and jerk of the Olympic weight lifting.

   **Back Squats**

   This is also very use full exercise to develop the leg strength and this type of Squats are done by keeping the loaded bar on the back of shoulders instead of on the front. This exercise strengthen the both groups of quadriceps muscles and hamstring muscles group and this one also the supplementary exercise of clean and jerk of the Olympic weight lifting and pulling ability of both lifts of weight lifting.
Overhead Press

In this exercise we push the weight loaded barbell in vertical direction to the ground up to maximum extension of elbow joints. It can be done in standing as well as in sitting position as per the need and interest of the individual. The Overhead Press strengthens our shoulders, triceps, back & abs. This is of two types one is front press and second is back press, this exercise can be done with the help dumbbell also.

Bench Press:

Most of the pupils of all ages across the world are doing this exercise to keep fit themselves. This is the first choice and most popular exercise in Novice body builders. In the entire gymnasium this is done with much interest. This is main exercise for chest (Pactrolis major and minor) & triceps muscles development.

Dead lift

In the weight lifting event back muscles play very important role in the starting of lift. This exercise is very use full to strengthen the total back including spine cord.

7. Power Clean and Power snatch

The Power Clean and power snatch are done by the barbell from the floor & putting it on your front shoulders without sitting. Theses exercises are very use full to develop the strength with speed

Cronin and Sleivert (2005) concluded that It is obvious there is a need for a great deal more research on the importance of training at $P_{\text{max}}$ [(maximal power)] and whether it advantages athletic performance over and above other loading intensities. First, the importance of $P_{\text{max}}$ to athletic performance needs to be established. It must be remembered that power is only one aspect that effects performance and it is quite likely that other strength measures may be equally important for determining the success of certain tasks (232).
The main argument that Cronin and Sleivert (2005) make is that research has not been consistent in finding an optimal load for maximal power output, and it appears that this measure is task dependent. Therefore, the optimal training load for a particular athlete is one that increases muscular power and strength measures across the entire spectrum of tasks involved in his or her sport. It would be scientifically impossible to figure out the specific power to be trained at to optimize power output for every skill sequence; there are too many skills in a sport, and the sequences vary due to spatial cues and fatigue.

Enoka, (1988) told about that the weightlifting events dislodgment of the barbell from floor to waist height is called the pull. The double-knee bend technique is executed in weightlifting, the pull practice is very important for load and skill related improvements. This is found that load and skill factors contributed to the power development at the hip, knee, and ankle joints. However, the average power produced in a lift was found to increase with load.

Storey, et.al. (2012) wrote that Weightlifting has been a longstanding part of the modern Olympic Games and has wide and growing international participation. During the performance of the two competitive lifts, the snatch and the clean and jerk (C&J), weightlifters are required to generate extremely high peak forces and contractile and rates of force development and, consequently, high peak power outputs and contractile impulses.

Szyszka and Mastalerz (2014) said that “The snatch technique is one discipline in Olympic weightlifting”. The lifter has to raise the barbell from the platform directly above their head in one movement.

Gourgoulis, et.al (2002) told that the 1987 World Weightlifting Championship was the first such event in which female weightlifters participated as competitors.
The event of two hand snatch of weight lifting game on progress

Figure No -1.1

This figure shows the recovery phase of weight lifter towards completion of the two hand snatch. This lift will be passed if minimum two judges gave decision in favour of weight lifter. After completion, lifter has to show complete balance of his body during the lift. He has to follow the certain rules of International Weight lifting Federation of this game.
Final posture of two hand snatch event of Weight lifting Game

Figure No- 1.2

This above figure shows the recovery phase of weight lifter towards completion of the two hand clean and jerk. This lift will be passed if minimum two judges gave decision in favour of weight lifter. After completion, lifter has to show complete balance of his body during the lift. He has to follow the certain rules of International Weight lifting Federation of this game. This is the second event of Olympic weight lifting game.
The lifter is ready to throw the weight to complete the two hands clean & Jerk

Figure No-1.3

This above figure shows the recovery phase of weight lifter towards completion of the two hand clean and jerk. In this lifter is preparing himself to complete the Two Hand Jerk after clean. This lift will be passed if minimum two judges gave decision in favour of weight lifter. After completion, lifter has to show complete balance of his body during the lift. He has to follow the certain rules of International Weight lifting Federation of this game. This is the second event of Olympic weight lifting game.
The final position of weight lifter in clean and jerk event of Weight lifting

Figure No1.4

In this above figure weight lifter is waiting for referee decision after completion of the two hand clean and jerk. In this lifter is preparing him to complete the Two Hand Jerk after clean. This lift will be passed if minimum two judges gave decision in favour of weight lifter. After completion, lifter has to show complete balance of his body during the lift. He has to follow the certain rules of International Weight lifting Federation of this game. This is the second event of Olympic weight lifting game. The position is decided by totalling best lift of each event.
1.7 Weightlifting in India

In 1935, the Indian Weightlifting Federation was formed. Sir Bijoy Chand Mahatab of Burdwan was its first president and N.N. Bose, Barrister-at-Law, was the first honorary secretary. In the same year it got affiliated with the Indian Olympic Association and International Weightlifting Federation. In the 1936 Berlin Olympic Games, Indian weightlifting team participated for the first time. Similarly, in the Asian games India participated in 1951 games held in Delhi and in the Commonwealth Games in 1966, at Kington. Weightlifting in India is popularly known as lifting only. Indian Women weight lifters competed in the World Championship for the first time in 1989 at Manchester although it started in 1987. Kunjurani Devi from Manipur earned three silver medals in that competition. Laita Polley from West Bengal added two bronze medals to this glory. In individual lifts, Shyamala Shetty and Chhaya Adak owned two medals. Indian weightlifting federation has it's headquarter in New Delhi, which is affiliated under the Indian Olympic Association, Delhi. Indian weightlifters got a full squad entry in World Championship only in 1957 at Tehran. In that competition Indian participator Mookan reached the highest ever eighth position. In the lightweight category, Alok Nath Ghosh was positioned 10th. Indian weightlifters continued its glorious journey at the 1995 World Championship also by winning three gold and six silver medals. Karnam Malleswari won gold medals both in the clean and jerk category and in the snatch category by lifting 113kg and 90 kg respectively. Thus she became the first India woman two win the World title for twice. Few other names that had their part in this success story are Manitombi Devi of the Central Reserve Police Force at the fourth position, Jeevan Jyothi at 5th position and Susmita Laha stood 5th in 76 kg. Above all, the official mouthpiece of the international weightlifting federation, World Weightlifting magazine ranked Indian weightlifters Kunjurani Devi and Karnam Malleswari as World no 1 weightlifter. The Indian weightlifting fame did not stop there as in 1966 Commonwealth games at Kingston, Jamaica, Mohan Lal Ghosh (60kg) created
a record for decades by winning a silver medal for jerk category. Then again in 1978 games in Edmonton, Canada, E Karunakaran won a gold medal in the flyweight section. He made another record by winning four gold medals in the Commonwealth games and for winning championship at a stretch from 1978 to 1981

1.8 **Weight Lifters in India**

Weightlifting in India got a jolt when three Indian weightlifters S. Sunaina, Sanamacha Chanu and Pratima Kumari were found guilty of doping in many international competitions in a year. For this reason, International Weightlifting Federation barred the Indian Weightlifting Federation for one year. But these issues cannot blemish the other victories by our Indian weightlifters like Karnam Malleswari’s achievement of being the first Indian who got an Olympic medal at the 2000 Summer Olympics at Sydney. One more Indian weightlifter, Geeta Rani became the star at the Commonwealth Games (2006) by winning the gold medal in women's + 75 kg category.

1.9 **History of Weightlifting:**

Although weightlifting is a sport that can be traced back to the earliest of the Olympic Games, it is only in the post World War II years that it has been given prominence in the national press of this country. And this has mainly come about because a certain aspect of weightlifting, weight training, has received widespread publicity because of the beneficial effects that it has produced in almost every branch of sport. Milo of Crotona, an Olympic champion for no less than twenty-eight years, was the first 'scientific' weightlifter in that he progressed from strength to strength by regularly lifting a calf as it grew into a bull. That was in 684 B.C. And this principle of progressive weightlifting still applies today.

**Kirkley (1957).** In the modern revival of the Olympic Games in 1896 records show that a Briton, Launceston Elliott, is credited with winning the 'One Hand' contest, with Jensen of Denmark winning the 'Two Hands' event. Modern weightlifting really began in the year 1920, when the Seventh Olympic
Games were held in Antwerp. At Paris, in 1924, the Two Hands Press and the Two Hands Snatch were added to these to make a five-lift championship. These lifts gave way later to the 'Olympic Three' the Two Hands Clean and Press, the Two Hands Snatch and the Two Hands Clean and Jerk which have remained the standard lifts to the present day. Now, the sport is controlled by an international body with more than sixty affiliated national associations. The U.S.A. and the U.S.S.R. On one side, in America, we have a great weightlifting team gathered, supported and encouraged almost solely by the efforts of one man, Bob Hoffman.

### 1.10 Modern Olympic Weightlifting

Kirkley, (1985). The standard tests to decide Olympic and world weightlifting championships are firmly established in the three lifts, Two Hands Clean and Press, Two Hands Snatch and the Two Hands Clean and Jerk. And while, of course, no set of just three weightlifting movements can be regarded as a fully comprehensive test it would not be easy to choose a more representative double-handed selection. Now although only three lifts are used for championships, there are other lifts officially recognized by the International Weightlifting Federation, i.e. the Right and Left Hand Snatch and the Right and Left Hand Clean and Jerk. And any of these can be included, as they once were, in the Olympic set; while world records are recognized. Modern competitive weight lifting is one sport of the strength athlete but to be a top-line or champion weight lifter one needs not to be only strong but also courageous, athletic, fast and mobile in joint and limb. Many doctors and other professional men practise weight lifting both as a sport and a means of keeping fit and one of the Russian world and Olympic champions, Doctor Arkady Voro-byev, is an eminent surgeon. Another, Yuri Vlasov, the world's strongest Olympic lifter, is a man of outstanding intelligence and his favourite diversion is the study of philosophy. He writes expert commentaries on aviation-engineering as well as fiction and poetry. The Japanese seven-man team for the 1960 Olympic Games was composed almost entirely of university students and grad-autos and in this
country almost every university has a weight-lifting group and annual university championships are held. The sport has been a firmly established part of the Olympic Games since the modern revival of the four-yearly event in 1896. Going back to that year, we find that the weight lifting event was divided into two separate contests a one-handed lift and a two-handed lift, both overhead movements in the Clean and Jerk style (incidentally, the two hands' contest was won by an Englishman, Launceston Elliott). It is interesting to note, too, that there were no bodyweight classes in those days all entered irrespective of size or weight and modern Olympic lifting as we know it did not really begin.

1.11 Weight categories of Weight lifting Game.

As per IWF, there are eight weight categories in senior, junior and youth men section and seven weight categories are in senior, junior and youth women. These weight categories are given below.

Senior and Junior (Men): 56kg, 62kg, 69kg, 77kg, 85kg, 94kg, 105kg and +105kg.
Youth (Men): 50kg, 56kg, 62kg, 69kg, 77kg, 85kg, 94kg and +94kg.
Senior, Junior and Youth (Women): 48kg, 53kg, 58kg, 63kg, 69kg, 75kg, and +75kg.
Youth (Women): 44kg, 48kg, 53kg, 58kg, 63kg, 69kg and +69kg.

1.12 Introduction of Power lifting

Nisell and Ekhholm (1986) The sport of power lifting has become one of the most popular disciplines in a collection of modern day activities commonly referred to as strength sports. Alongside other disciplines, such as bodybuilding, strongman and Olympic weightlifting, power lifting requires participants to engage extensively with resistance training to develop specific aspects of fitness. Of all the strength sports, power lifting is viewed as the discipline which requires competitors to exhibit the highest maximum strength capabilities. The training practices and subsequent phenotypes developed by power lifters have been used infrequently as a model for researchers to investigate topics such as the joint loading capacity of the human body. In this
game the maximal strength is considered of the power lifter during all three lifts. The speed of the movement is not considered, more speed can disturb the balance of the power lifters. If feet of the lifters deviate from starting position during the completion of the lift, such lift considered no lift as per International Power lifting Federation rules. There are three event in power lifting and each lifter can take only three attempts in each discipline.

**Starting position of Squat event of Power Lifting Game**

**Figure No-1.5**

In this above figure Power lifter is waiting for referee signal after taking final position to start the first event Squat. This lift will be passed if minimum two judges gave decision in favour of Power lifter. After completion, lifter has to show complete balance of his body during the lift. He has to follow the certain rules of International Power lifting Federation of this game. The position is
decided by totalling best lift of each event. The minimum increase in weight for next lift should be 2.5kg and every increase should be multiple of 2.5 kg.

**Starting position of second event Bench Press of power lifting Game**

*Figure No-1.6*

In this above figure Power lifter is waiting for referee signal after taking final position to start the second event (Bench Press). This lift will be passed if minimum two judges gave decision in favour of Power lifter. After completion, lifter has to show complete balance of his elbow joint and feet of power lifter during the lift. He has to follow the certain rules of International Power lifting Federation of this game. The position is decided by totalling best lift of each event.
Starting position of third event Dead Lift of Power lifting game

Figure No -1.7

In this above figure Power lifter is taking position to start the third event (Dead Lift). This lift will be passed if minimum two judges gave decision in favour of Power lifter. After completion, lifter has to show complete balance of his body during the lift. He has to follow the certain rules of International Power lifting Federation of this game. The position is decided by totalling best lift of each event. The minimum increase in weight for next lift should be 2.5kg and evry increase should be multiple of 2.5 kg. This event is directly related to lower
back muscles strength. The posture of spinal chord and knee joint have important role to get the success in the lift.

1.12 Power lifting in India

"INDIAN POWERLIFTING FEDERATION” that started in the year 1975 with a motto to improve health by doing iron games. In 1979 our Federation has been recognized by The Ministry of Youth Affairs & Sports, Govt. of India as well as The Indian Olympic Association. At present we are having more than 10,000 (ten thousand) Power lifters both Men & Women throughout the country with 37 affiliated State Association and 6 Central Govt. Office Board Units Championships.

Gambetta, (2007) written about various methodologies of strength training. In the world of strength training there are numerous methodologies that are used to increase the performance of athletes. Olympic lifting and Power lifting tend to be the most popular philosophies for coaches to incorporate because of their focus on power and strength development. With their proposed popularity comes a little controversy. Many Olympic lifters and Power lifters proclaim their style of training as the “method of choice” for training athletes. Each method of training elicits a unique training philosophy, program, and outcome.

Piper and Erdmann (1998) compared the weight lifting and power lifting. “Olympic-style weightlifting is an excellent training method for developing power. It consists of two movements, the clean and jerk and the snatch. The derivatives of those movements are what make up the majority of the training exercises”

Unlike its name, Power Lifting is a training method that focuses on maximum strength. “Power Lifting is centred on the three competition lifts of the squat, bench press, and the dead lift, power lifting develops strength in almost all major muscle groups” power lifting is a strength sport that consists of three attempts at maximal weight on three lifts: squat, bench press, and dead lift. Power lifting is a great sport that was conceived as a pure test of strength.
And it tests strength about as well as Olympic-style Weightlifting. The sport that consists of three events: squat, bench press and dead lift. Power lifters are very strong because they focus on developing that capacity exclusively. Overall, the strength of power lifters very close to that of Olympic-style weightlifters. However, power lifting is not an Olympic sport and it has multiple "federations" which govern it, so there can be multiple "world champions" each year (Olympic-style Weightlifting has only one international governing body and one world champion per weight class worldwide). Power lifting is also not practiced as widely as weightlifting. For all these reasons, the level of competition tends not to be as high in power lifting as it is in weightlifting, which is why competitive Weightlifters, as a group, have earned the right to call themselves the strongest athletes alive. More importantly, no other athletes approach the strength of weightlifters and power lifters, as the men and women who compete in these sports are totally focused becoming the strongest athletes in the world. Moreover, they compete on measurable events which are standardized worldwide, so that performances can be reasonably compared. You won't see these athletes flexing their muscles or lifting tree trunks on "pay-per-view", but they are quietly driving the levels of human performance to all time highs.

1.13 History of Power lifting

The roots of power lifting are in traditions of strength training stretching back as far as Greek and Roman times. The modern sport originated in the USA and the UK in the 1950s. During this period Olympic weightlifting declined in the United States, while strength sports gained many new followers. The first genuine national ‘meet’ was held in September 1964 under the auspices of the York Barbell Company, Bob Hoffman, was the owner of this company. During the late 1950s and early 1960s various ‘odd lift’ events gradually developed into the specific lifts, the bench press, the squat, and the dead lift and lifted in that order. The first British Championship was held in 1966. During the late 60’s and at the beginning of the 70’s, various friendly
international contests were held. At the same time, in early November of each year and to commemorate Bob Hoffman’s birthday, a prestige lifting contest was always held as part of "Bob Hoffman’s Birthday Party." In 1971, it was decided to make this event the "World Weightlifting Championships." There was no such thing as ‘teams’ and thus was predominantly a whole bunch of American lifters, plus four from Great Britain and one from the West Indies. All the Referees were American. This event got off the mark in York, Pennsylvania, at 10.05 am on Saturday 6 November 1971. In 1972 the “second” AAU World Championships were held. With 67 lifters in all, the other 47 were Americans. Lifts were still measured in pounds, the bench press was the first lift, Pacifico just won against another American. The International Power lifting Federation was formed immediately after the contest, and so none of the lifts could be yet registered as official world records. The 1973 Worlds was also held in York, Pennsylvania, American Bob Crist was the IPF President, and another American, Clarence Johnson, was Vice-President. 1973 was the first time that the lifts were done in the order we now recognize – Squat, Bench Press, Dead lift (although still lifting in pounds) 1974 was the first time that teams had to be selected in advance. With 74 entrants this was the largest Worlds so far. The 52 kg class was introduced and there were 9 lifters entered. In 1975 the World Championships was held outside America for the first time, in Birmingham, England first time the Television Company filming the event. The establishment of the IPF in 1973 spurred the establishment of the EPF (European Power lifting Federation) in 1974. The first U. S. national championships for women were held in 1978 and the IPF added women's competition in 1979. The U.S.P.F. was founded in 1980 as the new national governing body for American powerlifting. In 1981, the American Drug Free Power lifting Association (ADFPA), led by Brother Bennett, became the first federation to break away from the USPF, citing the need to implement effective drug testing in the sport. In 1982, drug testing was introduced to the IPF men's international championship, although the USPF championships that year did not have drug testing. There are so many exercises have to do to
increase the performance in the game of power lifting. This game totally different from the weight lifting in all respect. The maximum exercises of power lifters are in common practice of weight lifters in their training schedule simultaneously the power lifters cannot perform the weight lifting style because the technique of weight lifting is typical and hard as compared to power lifting.

**Squat.** This is very important exercise to develop the maximal leg strength, this component is very essential in this game and should be the part of any routine strength exercise. The technique of the squat is different from weight lifters mainly the position of the feet is different and in the event just they break the horizontal plain nearly to half squat. This exercise also increase the load bearing capacity of spinal cord also strengthen the lumber portion of the back. These exercises strengthen the quadriceps muscles and hamstring muscle groups of our lower limb. there are so many types of squats used to develop the strength of legs as given below.

**Bench Press:**

This is the second event of the power lifting game, this event is the measurement of the strength of arm and chest of contestant. Most of the pupils of all ages across the world are doing this exercise to keep fit themselves. This is the first choice and most popular exercise in Novice body builders. In the entire gymnasium this is done with much interest. This is main exercise for chest (Pactrolis major and minor) & triceps muscles development.

**Dead lift**

In the power lifting event back muscles play very important role in the starting of lift. This is the third event of power lifting game the position of legs is totally different from the position of weight lifters. This exercise is very use full to strengthen the total back including spine cord.

### 1.14 Weight categories of power lifting

Most power lifting federations use the following weight classes: **Men:** 52 kg, 56 kg, 60 kg, 67.5 kg, 75 kg, 82.5 kg, 90 kg, 100 kg, 110 kg, 125 kg, 125 kg +
Women: 44 kg, 48 kg, 52 kg, 56 kg, 60 kg, 67.5 kg, 75 kg, 82.5 kg, 90 kg, +90 kg

1.15 IPF Weight Classes

In 2011, the IPF introduced the following new weight classes:

Men: up to 53 kg (Sub-Junior/Junior), 59 kg, 66 kg, 74 kg, 83 kg, 93 kg, 105 kg, 120 kg, +120 kg
Women: up to 43 kg (Sub-Junior/Junior), 47 kg, 52 kg, 57 kg, 63 kg, 72 kg, 84 kg, +84 kg

1.16 Comparison of weight lifting & Power lifting

The most important aspect of athletic development should be focused on the training of absolute Strength. Power lifting is rooted in this philosophy. Powerlifters are constantly training to develop absolute strength and explosive strength. They (power lifters) understand that without this basic strength, training cannot progress. Power lifting methods make the training of absolute strength a priority. It is my view that strength and conditioning coaches across the board do the same. Too many strength and conditioning coaches are quick to implement Olympic lifting methods into their training programs without first developing an athlete with a strong foundation of absolute strength training. This opinion can be supported by a statement from

Gambetta, (2007) Describe that the training of Power lifting is a best method for athletes to develop absolute strength. Which act as the base for explosive strength development? Many strength professionals think that Olympic training is best way to develop explosive strength in athletes. Trainability of power lifting event is easy as compared to weight lifting, this have a high technical demand. The weight lifting do generate tremendous power because more the range of movements with much speed is required. This explosive power production is highly dependent on technical proficiency of the individual lifter”

Hoffman, et.al. (2004) stated that Olympic Weightlifting performance is power specific force development, or speed strength event. In this training
athletes do the training with heavy loads at a high velocity, resulting in a high power output.

**Hori and Stone, (2004)** conclude that the weight lifting training produce speed strength in athletes. An athlete’s power capacity includes “maximum strength, high load speed strength, low load speed strength, rate of force development, reactive strength, skill performance, and power endurance.” With the help of weight lifting training athletes can increase their speed strength. This is done specifically because in snatch and clean and jerk athletes extend their hips, knees and ankle joints to push against the ground as hard and as rapidly as possible producing acceleration on the body and the barbell.

**Siff, (2003)** also found that explosive strength is developed due to the heavy weight over head activity, and movements with high loads away from the body’s centre of gravity. In terms of Olympic weightlifting, the question becomes “How fast are you strong?” Athletic activities usually require quick and powerful movements and, consequently depend on the development of explosive strength.

**Zatsiorsky and Kraemer,(2006)** described that absolute strength is the base of explosive strength The main aspect of power lifting is the development of absolute or maximal strength.

**Wenzel and Perfetto, (1992)** confirmed the belief that an athlete must first develop maximal strength and make it a priority in training over high velocity movements in order to develop explosive strength.

Power lifting can develop explosive strength within the particular movement. All sports require different type of muscle synchronization, balance, flexibility, and coordination as well as strength, speed, power, and metabolic development. Olympic weightlifting helps the athletes to develop in all above components. While maximal strength training produces negative effect on movement speed and the explosive ability on the various muscles groups.
Hoffman et.al. (2004) again emphasized that Olympic lifting is a better approach athletes for their training, largely due to biomechanical specificity and speed of the movements which leads to a higher power output.

Simmons, (2001) told about various methodologies to train athletes and the expert trainer understand the important relationship between explosive strength and absolute strength. World class power lifting coach Louie Simmons expands on this relationship by stating, “It is essential that explosive strength play a large role in training, as it not only a means of developing absolute strength but also a method of raising physical fitness that is directed toward solving a specific sports task”.

Simmons, (2005) added that higher power output production can lead to a greater effect on athletic performance than the production that power lifting could provide.

Kawamori and Haff, (2004). “Additionally, the development of some fitness components (e.g., maximal strength) should be a prerequisite to the development of other components (e.g., speed strength, power). Therefore, it is crucial to train different components in the logical sequence (i.e., periodization) so athletes can maximally develop muscular power toward the end of macro cycle or a yearly cycle, when the most important competitions are scheduled, while minimizing the risk of overtraining or injuries” Coaches should not consider Power lifting or Olympic lifting as being better or worse than the other, but rather as two pieces of the puzzle working together to enhance athletic performance as stated by Chui. “Rather than one or the other, it is the combination of both maximal strength training and explosive weight training, in a sequenced manner, that will elicit the best results for the strength and condition professional”

Chiu, (2007) said that in a perfect world all facets of training (i.e. power, strength, speed, agility, balance, and conditioning) would be incorporated into an athletic strength and conditioning program. Therefore, both methodologies (Power lifting and Olympic lifting) are important entities
for the development of athletes. “Weight lifting (Olympic lifting) and Power lifting should not be considered competing but rather complimentary methodologies” A well-rounded training program should not be limited to only one area of emphasis but rather to incorporate all components that are specific to the athletes sport or activity. Although the philosophy of training may be different, the goal of training athletes should be the same. Enhancing performance and reducing injury should always be the centre piece of strength and conditioning program.

**Romanian Federation News (2009)** In conclusion, the adaptation of both major training methodologies could illicit a greater return since both parameters are being trained (maximum strength and power). It is the inclusion and variation of training variables that will give added benefit to the athlete versus the exclusion and elimination of competing methodologies and standards. The sharp increase in the weightlifting performances, a phenomenon that we are permanently witnessing, is based on the technique and training methods improvement. The modernization of the materials and equipment for training and competition (stage, platform, podium, barbells, arbitration and display equipment, computer programs for competitions conducting) have imposed the emancipation and selection of the lifting styles, of the arbitration regulations and resulted in the increased performance and spectacular character of this sports branch

**Bompa and Carrera, (2006)** explains that a high-level performance is the result of years of intense training, methodical and well planned. All along this period, the athlete tries to adapt his body functions to the specific requirements of the sport he had chosen. The adaptation level is reflected in the performance capacities. Higher the degree of adaptation, better the performance

### 1.17 Socio-economic Status

The game of Power lifting and weight lifting are typical major games and played throughout the country. Power lifting is an outdoor strenuous but healthy and interesting game in Aurangabad District. The game of Power lifting
and weight lifting differ with each other in their skills, techniques and strategies. It has been recognized that socio-economic factors play a vital role in an individual’s performance in sports. The Socio-economic status make-up of an individual plays an important role in their achievements in every field of life. Considerable research has been conducted on the socio-economic status of sports persons; team sport versus individual sport, Men players versus Women players. But very few research studies are available in published from an socio-economic status of games like Power lifting and weight lifting players. There are many psychological factors like socio-economic status attitudes, motives, spectators, self concept, motivation, adjustment etc., which influence the participation and performance of sportsmen in games and sports. The socio-economic status of the group and the status of an individual in his group influence competitive and co-operative behavior for different reasons and the different factors than those motivating people in the middle and upper economic group influencing the well being of the players.

Socio Economic Status is one non-modifiable factor of interest that may influence Physical activities. Krieger, Williams, and Moss (1997) define socioeconomic position as "an aggregate concept that includes both resource-based and prestige-based measures, as linked to both childhood and adult social class position" (p. 345). Although they suggest that the term Socio Economic Status confuses the difference between resource-based measures such as income and education, and prestige-based measures such as occupation.

Krieger et. al. (1997), Socio Economic Status is an appropriate term for the current thesis given the social class measures of interest are both resource-based and prestige-based measures. Socio Economic Status is often considered a personal demographic variable; however, SES can also reflect aspects of an individual's broader environment. As a result, it can be measured at the individual level or the area level.

Individual measures of Socio Economic Status such as income, education, and occupation reflect the opportunities and resources people might
have, and are part of one's intrapersonal environment. For example, occupation might determine whether someone can afford the time and expense of participation in organized sports (Lynch & Kaplan, 2000).

Area level measures are either aggregated individual indicators or can be used to represent contextual effects of Socio Economic Status. For example, the average income of a neighbourhood might help to explain the resources that are available or not, to that specific community.

To target low Socio Economic Status populations, and in accordance with ecological models, policies could ensure that community programs are available in under-serviced or lower income neighbourhoods, or that the physical environment is conducive to playing safely (e.g., parks with lights, well-maintained pathways) (Chen et. al. 2002). This would provide youth with a location to be active without the need to participate in fee-based activities. Given that in 2005 10.8% of Canadians were considered of low-income and childhood poverty rates mirror those of adults (Human Resources and Skills Development Canada, 2009), there are a number of children and adolescents who would benefit from no-cost and/or fee-reduced programs. When examining the Socio Economic Status and health relationships among children and adolescents, physical activity being the health behaviour topic of discussion, parent Socio Economic Status indicators of education, income, wealth or occupational status often determine how youth are categorized according to Socio Economic Status.

Interestingly, Starfield and colleagues (2002) suggest that the influence of parental Socio Economic Status likely varies from childhood to early and late adolescence as a child's high level of independence shifts to a point of independence by late adolescence. Of particular interest then is understanding: 1) if and when Socio Economic Status is related to physical activity of children and adolescents and 2) the factors underlying such a relationship. The former point warrants investigation to identify the specific target group most in need of a physical activity intervention.
According to Sallis and Owen (1999), non-modifiable variables such as Socio Economic Status direct interventionists to groups who are in need of a physical activity intervention. Furthermore, identifying when along the developmental trajectory Socio Economic Status is influential on physical activity behaviour is important for determining the ages that require interventions. For instance, if Socio Economic Status is related to physical activity among children but not adolescents, interventions are required for low Socio Economic Status children but may not be required for low Socio Economic Status adolescents. If a relationship between Socio Economic Status and physical activity is found for children and/or adolescents, the latter point speaks to the need to identify what components should specifically be addressed in an intervention to increase physical activity for a particular target group. For instance, should certain groups receive free gym memberships, do children require transportation to physical activity venues, or do parents need a tax break on their child's physical activity registrations? These two issues will be investigated below.

Rochelle et.al (2015) Sports has boomed into prominence as a major social event in our life. It reflects society particularly with regards to the character of human an institutional relations, and the ideological foundations rationalising these relations. It commands the enthusiasm increasing number of people throughout the world. In all parts of the world power in sports is a status symbol of nations as well as of individuals. It provides channels of communication and friendly contacts for hundreds of thousands of men and women

One key influence on participation is Socio-Economic Status (SES). This determinant impacts upon many PA determinants across a number of the Socio-Ecological model’s domains. Steenhuis et.al. (2009) consistently reported in both quantitative and qualitative studies that people with higher SES are more likely than those with lower SES to participate in PA, and more specifically in sport. Chen et.al. (2002) (SES) is associated with a range of
negative health outcomes, including higher rates of chronic illnesses, vision and hearing problems, injury, and acute illnesses

1.18 Statement of the problem

"ANALYSIS OF PHYSICAL FITNESS COMPONENTS & SOCIO-ECONOMIC STATUS OF WEIGHT LIFTERS & POWER LIFTERS OF HARYANA STATE"

1.19 Objectives of the Study:

The present study will keep following main objectives in view:

1. To study physical fitness components of weight lifters and power lifters at different levels of socio-economic status, it would be pertinent for the coaches and physical educators to check the individual weakness regarding their fitness.

2. To study the socio-economic status of weight lifters and power lifters of Haryana State.

3. To find out difference between physical fitness of light weight lifters, heavy weight lifters and power lifters.

4. To find out the difference in physical fitness components of weight lifters and power lifters belonging to low, middle and high socio-economic status.

5. To find out the interactional effects of weight category and socio-economic status on physical components.

6. To find out the difference in physical fitness components in relation to socio-economic status of light weight, middle weight, heavy weight, weight lifters and power lifters.

7. To state the implication of the study and suggest methods for improvement in weightlifting and power lifting training.

8. The result of the present study would add new objective findings in the literature which would be much helpful to many physical educators and coaches in the field of strength training and physical education.
9. The result and procedure of the study would be a stepping stone to some more research for better information and also to resolve the controversy in literature.

1.20 Hypotheses of the Study

Complimenting the research questions, the hypotheses of this study are:

1. There exists no significant difference in the physical fitness components of weight lifters & power lifters of Haryana state belonging to light weight, middle weight, heavy weight, weight categories.

2. There exist no significant difference in physical fitness components of Haryana State weight lifters and power lifters belonging to low, middle and high socio-economic status.

3. There exist no interactional effects of weight category and socio-economic status on physical fitness components of Haryana state weight lifters and power lifters.

4. There is no significant difference found related to their socio-economic status between weight lifters & power lifters.

5. There exist no significant difference in socio-economic status of Haryana state weight lifters and power lifters belonging to light weight, middle weight and heavy weight, weight categories.

6. There is no significant difference in the physical fitness components of light weight, weight, weight lifters & power lifters as compared with heavy weight lifters and power lifters.

7. There exist no significant difference in physical fitness components in relation to socio-economic status of light weight, middle weight and heavy weight, weight categories of Haryana state.

1.21 Significance of the Study

1. There would be significance difference in physical components of weight lifters and power lifters in relation to their socio-economic status. Hence it would be pertinent for the coaches and physical educators to set further guidelines for better performance.
2. The results of present study would add new objective findings in the literature which would be much helpful to many physical educators and coaches in the field of weight lifting and power lifting.

3. This study will be useful for Power lifters of Haryana State students to improve their skills.

4. This study will be supportive in improving the capacity of weight lifters for increase in performance.

5. The results of study will provide productive outcome in academic knowledge to the experts of strength training field.

6. This study will be helpful in the field of sports multinational companies, books writing, hospitals etc.

7. The study will be of large importance for the sports professional like coaches, trainer to understand the relationship between physical fitness components and socio economic status of weight lifters and power lifters.

8. This study will facilitate in growth and development and more and more scientific approach in weight lifting and power lifting Games.

9. This study will undoubtedly help to various fields experts to prepare training schedule for all age groups to maintain the health.

10. This study will help to open up a probable channel between performance and socio economic status.

11. The strength training schedule of weight training exercises can be included in the syllabus of primary to higher secondary school for boys and girls students.

12. The implementation of such training programmes in the schools and colleges level will certainly help to make sound and strong citizen of society of our country.

13. Such training programmes can also be implemented on the employees of government and private sectors to increase their working efficiency.

14. This study will help for other researchers to do work on other physiological and motor fitness variables selection.
15. Such training programmes can be given to the deaf, blind and handicapped citizens of society to make them safe and sound.

1.22 Delimitations of the study

The present research study was delimitated to:

1. Only on male weight lifters and power lifters of Haryana State Were selected.

2. The sample consists of first three position holder of Kurukshetra University Kurukshetra, MD University Rohtak & Haryana State senior championship for the session 2012-13.

3. Only five major components of physical fitness i.e., Endurance, Strength, Speed, Agility and Power have been measured through physical fitness test.

4. The socio-economic status of the players has been assessed on the basis of information collected through questionnaire.

1.23 Limitations of the study

1. The following points were deemed the limitation of the present study for weight lifting and power lifting.

2. Non availability of the adequate literature of above two games was deemed as the limitation of the study.

3. All selected subjects were briefed about the study after which they volunteered for the present study.

4. No special motivational technique was used during the administration of physical fitness test and to fill SES questionnaires, therefore the difference that may have occurred in performance due to lack of impetus was recorded as the limitation of the study.

5. Certain factors like stress of competition lack of adequate rest and relaxation injury to individual which may affect the conclusion of the study.

6. As the subjects came from different socio economic background, different level of performance, different life style, routine of work and
leisure were different which were measured as the limitation of the study.

7. Rajbir and other constructed questionnaires might have their own limitations.

8. It was assumed that all subjects answered all questionnaires truthfully and performed the physical fitness test with his full capacity.

9. Weight lifters and power lifters lifestyle, home environment, daily routine and food habits of students could not be controlled.

10. Common instructions were given to all the Weight lifters and power lifters of all the weight categories the understanding about the things were out of control of researcher because most of students belonged to the rural and urban area, different socioeconomic status and of different performance level. it was quite impossible to control them by the researcher.

11. The criteria of religion, urban, rural, diet habits and socio-economic status criteria were out of control during the research programme.