

Chapter I

INTRODUCTION

1.1 SPORTS

Sports performance has dramatically progressed over the past few decades. Performance levels unimaginable before are now common and the number of athletes capable of outstanding results are increasing. One among the contributing factors is that sports is a challenging field and intense motivation has encouraged long, hard hours of work. Also coaching has become more sophisticated, partially from the assistance of sports specialists and scientists. Sports sciences have progressed from descriptive to scientific. A broader base of knowledge about sports existing now is reflected in training methodology (**Karl, Bookwalter & Harold Vanderwaag, 1972**).

Sports in the present world have become extremely competitive. It is not the mere participation or practice that brings out victory to an individual. Therefore, sports life is affected by various factors like Physiology, Biomechanics, Sports Training, Sports Medicine, Sociology and Sports Psychology etcetera. All the coaches, trainers, physical education personnel and doctors are doing their best to improve the performance of the players of their country. Athlete or players of all the countries are also trying hard to bring laurels/medals for their countries in International competitions (**Charles A. Bucher., & Deborah, A. Wuest., 1987**).

Today athletes face some unique challenges. The standards are higher, the competition is tougher, and the stakes are greater. Among the best, preparation is more complete and the psychological component is more important than ever before. Years ago, high performance amateur athletes may have been able to distinguish

themselves in competition without developing a highly refined mental game plan but to hope for that today is much like hoping that god will come down during a time out to tell you how to turn a game around (**Terry Orlick., 1986**).

During the last few decades, coaches and athletes from a wide variety of sports have begun to realize the importance of the mental side of athletic performance. More specifically, individuals involved with organized sport now understand that for athletes to perform at their peak level of efficiency, they must possess and use a number of psychological skills. This is also true within the world of track and field as coaches and athletes have become interested in enhancing their athletes' psychological skills. Almost all performances depend on the ability of applying psychological skills against a game situation. Increased mental skill will often contribute to better performance. Sports psychology has long been recognized as an essential element in all physical activities and is generally considered to be a basic component of sports performance (**Butt & Dorcus Susan, 1987**).

1.2 PSYCHOLOGY

“As the science of behaviour and cognitive process”, in other words psychologist is concerned with obtaining scientific information on everything we think and do. They examine observable behaviour, cognitive process, physiological events, socials and cultural influences and hidden largely unconscious process. They also look at the complex interactions between all of these different factors in order to understand behavior.

Psychology should focus on the study of conscious and experience. Our task is that of analyzing sensations, feelings, and images in to their most basic parts, just as chemists analyse complex substances. In that way we will come to understand the

nature of the human mind what it is. We can accomplish this through introspection asking individuals to describe what is going on in their own mind as they perform various tasks or have specific experience.

Psychology is an extremely exciting and challenging field of knowledge. It continues to go in an accelerating phase, each year and it continues to provide answers to basic questions about the human condition. Psychology has enormous potential. It offers as the hope of both understanding and improving our lives, our community and planet (**Allport, F.H., 1924**).

Modern psychology in contrast with its early status is an objective rather than subjective; experimental rather than speculative science. Psychology is an objective study of behaviour, does not lay down norms for behaviour. It simply explains how under such circumstances would and animal or a human being characteristically behave 'what should be' is no concern of psychology. No branch of this science talks of any norms or standards it explains how and why things happened the way they do so far as behaviour is concerned. In its extreme form psychology enters physiology and this suffices to prove the wood worth's thesis is that psychology is a science it aims to understand to get insight in to, to interpret and throw light on the mind, its processes and procedures implicit and explicit.

1.3 SPORTS PSYCHOLOGY

During the past two decades sports psychology has emerged as a legitimate field of scientific inquiry. As with all scientific endeavors, sports psychology shares the same basic goals of science, the observation of events, the description of phenomena, the explanation of the factors that influences events in systematic manner, the prediction of events or out comes based upon systematic and reliable

explanations and ultimately, the control of events or contingencies that result in expected outcomes. Sports psychology in many ways is a fortunate scientific field of inquiry. Researchers are afforded ample opportunity to observe, describe, and explain the various psychological factors that influence diverse aspects of sport and physical activity.

Sports psychology when viewed of as a sub-discipline within the larger field of psychology would be defined as an applied psychology or as a field of study in which the principles of psychology are applied. Sports psychology has not been recognized traditionally as a sub-disciplinary area of the study within the field of academic psychology. Scientists recently suggested that sports psychology is ready to be embraced by the mainstream of psychology.

The view of sports psychology as a sub-discipline within the field of sports and exercise science comes mostly from scientists in physical education. They argued that the academic discipline of physical education consists of the study of certain aspects of such fields as psychology, physiology, and anatomy.

“Sports psychology has evolved into an interdisciplinary field involving both sports scientists and psychologists. From an initial focus on sports performance as the primary outcomes of interest, sports and exercise psychology has broadened considerably. Performance enhancement remains an important area of research and applied work, but improvement of the quality of participant involvement in physical activity has emerged as an emphasis of researchers and practitioners. Although collegiate, professional, and elite amateur athletics have traditionally been the main recipients of attention, professionals have expanded the horizon to include youth competitors, adult recreational participants, masters’ athletics, and underserved

populations. In keeping with the winding range of population targeted for intervention, sport and exercise psychology research and practice extended beyond the playing field and the laboratory to the host of other venues, including schools, health clubs, sports medium clinics, counseling centers and private practice offices.

1.4 IMPORTANCE OF SPORT PSYCHOLOGY

Psychology of sport means applying psychological theories and concept to aspects of sport such as coaching and teaching. The sport psychologist use psychological assessment techniques and intervention strategies in an effort to help individuals to achieve their optimal performance. While sports psychology is concerned with analyzing human behaviour in various types of sport settings: it focuses on the mental aspects of performance.

Psychology as a behavioural science has made its contribution for improving sport performance. It has helped the coaches to coach more efficient athletics to perform more proficiently. This psychological aspect on sport is gaining much attention among sports administrators. A rapidly growing area of interest in sports psychology concerns the use of stress management, procedures such as biofeedback and relaxation training to enhance athletic performance by reducing **(Cattel, B.Raymond., 1965)**.

Preponderance of scientific evidence obtained from different investigations have revealed that apart from somatic and physiological variables techniques and tactics etcetera. The high level performance of a sportsmen is dependent upon his psychological makeup. Different psychic abilities play decisive roles in achieving top level performance in track and field athletics. Therefore superb psychological fitness

and training of the "individual" are important factors, which help in achieving outstanding performance.

Psychology can help the sportsman in the activity of sports excellence. The role of psychology in selection sports, training materials and rehabilitations would definitely help in achieving sports excellence. The emphasis has been laid on pointing out that psychology and sports converge at the same point and excellence in sports can be optimally obtained by developing appropriate strategies.

The success in sport depends on trust in your own strengths and abilities. If an athlete is well prepared for competition from a physical, technical and tactical point of view, the most important factor deciding about their degree of success is self confidence. Self confidence is considered to be one of the leading elements in successful athlete. Belief in one's self is at the center of sports performance. One of the most important factors determining self confidence involves trust in our ability to execute a task. It is a part of a broader concept of the "ego", which is deeply connected to our self evaluation or picture of us.

1.5 IMPORTANCE OF PERSONALITY

Personality is the total quality of the structure aptitudes, interest, capacities, attitudes and behaviour patterns, which are manifested in man's relation with the environment. It is a compound, grouping and resultant of many coordinated elements, some of which are inherited, some absorbed and some predominantly acquired **(Clarke & Clarke., 1972).**

Contemporary society finds greater dynamics of human personality in sports than in any other institution. In many ways participants in sporting activity are much better than non-participants. Sports persons were significantly better adjusted in the

areas of health, family, society and emotions while the non participants persons were better adjusted in the areas of education.

1.6 PERSONALITY TRAITS AND SPORTS

Personality is a vital factor in the wholesome of every human being. As in all other aspects of men's life, personality plays a predominant role in the physical activities games and sports form an important aspect of the physical activities in which man likes to take an active sport. Since early days sports have remained an integral part of human culture and modern age has institutionalized them. Contemporary society finds greater dynamics of human personality in sports than in any other institution. Development of personality through sports to an established fact, physical, intellectual, moral and social values of sports are undesirable, it is here that sports plays an important role. Thus human behavioural adjustments are influenced by participating in sports.

The experts have often claimed that participation in many forms of sports favors the development of personality. In many ways participants in sporting activity are much better than non participants. "Sports persons were significantly better adjusted in the areas of health, family, society and emotion while the non-sports persons were better adjusted in the areas of education".

The physical educator becomes interested in psychological studies because of the belief that personality in physical activities and sports somehow and the involvement in physical education and sports contributes to personal and social adjustments. At any rate the development of personality and the achievement of desirable social values have been objectives of physical education.

Some sports psychologists believe that certain personality traits were developed by participating in sports and games. All the important personality traits

such as self control, self confident, unselfishness, courage, perseverance, quick decision, sense of fair play sense of justice, courtesy, truthfulness, alertness, loyalty, teamwork, cooperation, obedience to leaders, ability to mix with others, friendliness, appreciating the superiority of other quality to face defeat or victory, sportsmanship, control of emotions are being developed in the field by participating in games and sports. So opportunities of cultivating these characteristics are available in game situation. These are very essential to a disciplined society. The play ground is a good laboratory to develop all these personality traits. Hence physical education plays a predominant role in molding the personality of the youth

Sports performance of individuals depends on the fitness on one hand and the psychological adjustment on the other. For the high level achievement of successful sportsman in competitive sport they need to be physically and mentally well-balanced.

1.7 PHYSICAL FITNESS

Physical fitness is a relative concept. There is a maximal fitness level that must be maintained to prevent organic deterioration and ensure proper physiological functioning. The main factor responsible for the performance level improvement is the development of new training methods based on scientific principles derived from exercise physiology.

Aging is an inevitable process; however the rate and magnitude of the decline in physiologic function may be attenuated by maintaining an active lifestyle. Research now suggests that lifestyle and environmental factors influence much of the physiologic deterioration previously considered “normal aging.”

The fitness, in a broad sense denotes dynamic qualities that allow satisfying by the needs regarding mental and emotional stability, social consciousness and adaptability, spiritual and moral and organic health, consistent with heredity.

Physical education is of great value for man not only for his present but also for his future. It is an education through physical activity for the development of total personality of the child to its fullness and perfection in body, mind and spirit. It makes him a fit person and then maintains his fitness. Physical fitness gives rise to sound mental makeup also. Physical fitness is an inseparable component of total fitness for effective living. Fitness involves inter relationship between intellectual and emotional as well as physical factors. The greater the physical fitness, the longer a person will be deep going; he or she will be able to perform more efficiently and at greater speed and to recuperate faster from fatigue.

Will goose states that physical fitness can be carefully structured through free exercise, self activities, stunts and gymnastics and number of various games, appropriate to grade level. Physical fitness means that the organic systems of the body are functioning efficiently so as to enable a fit man to engage in various tasks and leisure activity.

Physical fitness is the ability to carry out daily tasks with vigor and alertness, without undue fatigue and with ample energy to enjoy leisure time pursuits and to meet foreseen emergencies. Perhaps the nature of physical fitness can be understood in terms of co-ordination flexibility and the most important and complex of them is cardio respiratory endurance. While these components are inter-related and identifiable, they are not discrete; each contributes an essential element of physical fitness.

Physical fitness is one of the main mottos of physical education programme. Physical fitness is defined as the ability of the body to adopt and recovery from strenuous exercises. The sports performance depends largely on physical fitness that is, speed, strength, power, agility and coordinative abilities. The process of improvement of a motor ability is also called conditioning. Physical fitness is a matter of fundamental importance to the well being of the every individual in the field of physical education.

1.8 THE IMPORTANCE OF PHYSICAL FITNESS

In its most general meaning, physical fitness is a general state of good physical health. Obtaining and maintaining physical fitness is a result of physical activities, proper diet and nutrition and of course proper rest for physical recovery. In its simplest terms, physical fitness is to the human body what fine-tuning is to an engine. It enables people to perform up to their potential. Regardless of age, fitness can be described as a condition that helps individuals look, feel and to do their best. Thus, physical fitness trainers describe it as the ability to perform daily tasks vigorously and alertly, with left over energy to enjoy leisure-time activities and meet emergency demands. Specifically true for senior citizens. Physical fitness is the ability to endure, bear up, withstand stress and carry on in circumstances where an unfit person could not continue.

If one should be considered physically fit, the heart, lungs, and muscles have to perform at a certain level for the individual to continue feeling capable of performing an activity. At the same time, human body directly affects the state of mind, fitness influences to some degree qualities such as mental alertness and emotional expression stimulate heart and lung activity. To produce a benefit, aerobic

training must raise the heart rate (pulse) to the exerciser's target level for at least 20 minutes and include at least three sessions a week. The concept of aerobics was pioneered by **Kenneth H. Cooper** and was popularized in his books aerobics (1968) and the aerobics way (1977) ("**To produce**", 2012).

1.9 FITNESS AND PAST

Since early in the development of home Spain, people have realized the benefits of being physically fit for varying cultures. The Greek provided a rich heritage of mind-body with and clarified the esthetically developed all named athlete.

The Roman in the early part of the empire illustrated the utilitarian good of a fit people. During the next thousand years, only the knights developed these bodies, but they did so primarily for military conquest rather than for any inherent value. The renaissance led by the philosophers and educators reemphasized "A sound mind in a sound body". Although this grappled with whether the mind and body were separate entities. Naturalism and nationalism directly influenced the development of gymnastics system in Germany, Denmark, Sweden, England and Russia.

1.10 FITNESS AND PRESENT

Modern world is the outcome of many scientific inventions through centuries. Scientific instruments and machineries big and small have helped to live our daily life with ease to comfort. The modern man depends mostly upon the modern outfits for his daily routine involving mainly his mental power to live an easy going life. Modern man need not toil like his fore fathers for his daily life. So he has become less vigorous and lethargic.

Every individual should develop his strength and stamina for a happy and effective living. In order to get proper strength and stamina one has, to involve in physical activities. **Larson LA., & Yocom RD., (1951)** say components of physical fitness are resistance muscular strength and endurance, cardio vascular respiratory endurance, muscular power, flexibility, speed, agility, co-ordination, balance and accuracy.

1.11 FITNESS AND FUTURE

Health fitness invariably offered the people opportunity to live longer and this adds to the quality of everyday life. Health and physical fitness are certainly applicable to the old saying said in connection with exercise. “If you don’t use it you lose it”. It is not only necessary for the body alone but for soul also.

Exercise can be performed in many ways modern men and women feel that their daily work provides them with enough exercise for fitness. Running up and down stairs and standing all day at a job seems to be physical exertion. Physical fitness is the ability to meet each days demand without becoming exhausted. It is the ability to take part in the necessary activities with ease and enjoyment most important is the ability to have a reservoir of endurance for life’s emergencies. In short, physical fitness is that condition of your body that gives buoyancy to living (**John Walsh., 1991**).

Pation states that fitness is that one who is well adjusts to his environment, whose mind and body are in harmony and who can meet the normal demand, both mentally and physically without undue fatigue.

1.12 DEVELOPMENT OF PHYSICAL FITNESS

To develop fitness, there are so many training methods adopted in sports and games that are circuit training, fartlek training, interval training, pressure training, weight training and resistance training. Device ping and maintaining physical fitness requires vigorous effort by the body as a whole strength, muscular endurance, flexibility and cardio-respiratory endurance are the basic components of fitness. **Singh (1991)** stated that the effect of vigorous training upon certain systems is immediately noticed and felt. In the light of the effect of training it must be apparent that the growth and development of muscular endurance cannot be stately neglected even though they may appear to be non essential.

During vigorous training the blood circulation quickens the blood and lymph stream through the muscles supplying the cell with oxygen and nutrition removing waste products. The heart activity is accelerated exercising and strengthening its own fibers. Exercise also stimulates growth and strengthens the bones, muscular ligaments and tendons.

1.13 THE GAME OF TEAM HANDBALL

Team handball, also sometimes called continental, European and Olympic handball, provides a wealth of possibilities for school and community recreation programs that have as yet gone relatively untried in the English speaking world. This activity which takes its origin from soccer has evolved under the influence of basketball and yet is a unique Olympic sport, second only to soccer as the most popular sport of Europe.

It is fun to play and exciting to watch. The players and spectators alike enjoy the rapid continuous play, the fast-breaks, the fleet and varied hand movements in

passes and shots, and the spectacular leaps and dives into the air followed by the lightning reactions of the goalkeeper. It is essentially a simple game, easily played and enjoyed at first attempt by anyone at any age. Even at the highest international level, it is essentially a game of well learned fundamentals. Executed swatted the response to develop situations.

Handball is a relatively uncomplicated team game with fourteen players to a side where six court players and a goaler of one team oppose the same number from another team. The remaining five players may be substituted in from the side lines at centre court at any time. The object of the game is to throw the ball into the opponent's goal and defend one's own. Although the basic rules are similar to those of soccer, the ball is moved with the hands and the game is played on an area more similar to that of basketball. At either end of the playing area (40m by 20 m) is a set of miniature soccer goals (2m by 3m). There is also a goal crease 6 meters in front of and around each goal which is the exclusive territory of the goalkeeper who may use any means he can to defend his goal.

Begun by a throw-on from centre court at the referee's whistle, the game proceeds much as does soccer until a goal is scored at which time the team scored against takes a throw-on. The ball is played with hands and may be passed or dribbled as in basketball, carried for three steps or held for a maximum of three seconds while stationary.

For any illegal play such as holding, pushing or taking too many steps, a free-throw is awarded the opponents at the point of the infraction. Illegal defensive play in the vicinity of the goal-area which destroys a scoring chance results in a penalty-shot from the penalty mark seven meters in front of the goal. If the ball crosses a side-line,

play is stopped and restarted with a throw-in by a player on the team opposite to that of the player who last touched the ball. When the ball crosses the goal-line outside the goal having last been touched by a defending player other than the goaler, there is a corner-throw. At all other times, when the ball crosses the goal-line outside the goal, it is the goaler's ball. Handball is a fast game when well played, with continuous rapid movement of the ball and quick changes of the teams from offense to defense.

1.14 IMPORTANCE OF HANDBALL

Handball is one of those rare games that is easy to learn, but difficult to perfect. The essential rules are easily understood and strategy may be developed in the course of play. Essentially a game of running, jumping, throwing and catching, it is played with enjoyment on the first attempt by a beginner of any age. In fact, it is an excellent activity to develop these natural, basic movement patterns. At the same time, the many unique and refined skills of the advanced player are readily identifiable and continue to be developed with years of practice and experience.

Although enjoyed by an individual at any fitness level, it is a game of movement where running plays a dominant role and therefore is a good cardio-respiratory conditioner. It also develops in its participants speed, agility, strength and endurance. Because of its nature, it is suitable for participants of any build, size or height. It is played with exactly the same rules by males and females except for the size of the ball and length of the game. It is a good off-season activity for those engaged in other sports and may be used as a lead-up to other team games.

To meet varying circumstances of facilities, equipment and players, considerable modification of the game is possible without changing its essential nature and length of the game decreasing with younger players, there are also smaller

goals available, and the goal areas is readily modified. It may be played indoors or out, on a court of any size from the small, low ceiling playroom of the elementary school or community centre, to a full sized soccer field. Although variety, it may be played by more or fewer depending upon the playing area and number of participants available well as the size and weight of the ball.

1.15 STATEMENT OF THE PROBLEM

The purpose of the study was to analysis the physical fitness and personality traits of Basketball and Handball players at different topography.

1.16 OBJECTIVES OF THE STUDY

1. To compare the level of the physical fitness among college, district and university Basketball players.
2. To compare the level of the Personality traits among college, district and university Basketball players.
3. To compare the level of the physical fitness among college, district and university Handball players.
4. To compare the level of the Personality traits among college, district and university Handball players.
5. To compare the level of the physical fitness between college basketball and Handball players at different topography.
6. To compare the level of the personality traits between college basketball and Handball players at different topography.

7. To compare the level of the physical fitness between district basketball and Handball players at different topography.

8. To compare the level of the personality traits between district basketball and Handball players at different topography.

9. To compare the level of the physical fitness between university basketball and Handball players at different topography.

10. To compare the level of the personality traits between university basketball and Handball players at different topography.

1.17 DELIMITATIONS

The following delimitations were applied to this study.

1. To achieve the purpose of the study, 50 male players were selected randomly from each category of Basketball and Handball at different topography (College, District and University Level) and a total of 300 players from Kerala State, India who had their credit in participating intercollegiate, interdistrict and interuniversity tournaments in their respective games were selected for this study.

<u>Level of participation</u>	<u>Basketball</u>	<u>Handball</u>
College	n=50	n=50
District	n=50	n=50
University	n=50	n=50
Total	n=150	n=150

2. The subject's age ranged between 18 to 25 years.

3. The following criterion variables were selected for this study such as

Physical fitness Variables

Strength

Strength Endurance

Agility

Explosive Power

Speed

Cardiovascular Endurance

Psychological Variables

Personality Traits (Cattell's Sixteen Personality Factor)

4. The selected variables were tested with standardized test items and questionnaire as mentioned in the methodology.

5. Since the manual operation was made during shuttle run, 50 yard run and 600 yard run, the time was recorded in one tenth of a second.

6. The study related to physical fitness and personality traits were applicable only to Basketball and Handball players and the conclusions cannot be extended beyond this population.

7. This study was confined to college, district and university players in Kerala state, India.

1.18 LIMITATIONS

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

1. The previous experience of the subjects in the field of sports and games, which might have influenced on the testing the variables were not considered.
2. Psychological factors, food habits, rest period, life style, extracurricular activities etcetera, could not be controlled.
3. The atmospheric temperature, humidity and meteorological factors during testing were also not considered.
4. Though the subjects were motivated verbally, no attempt was made to differentiate the motivation level during the period of testing.
5. The responses of the subjects to the statements in the questionnaire would depend upon various factors, such as understanding of the statements, seriousness and sincerity of the subjects' etcetera.
6. The accuracy and reliability of the subjects' responses to the questionnaire could not therefore be assessed.
7. The subjects for the study had differed in weights, sex, geographic conditions, sociological factors and economical conditions.

1.19 HYPOTHESES

Hypothesis 1: There would be significant difference among college, district and university basketball players on selected physical fitness variables such as strength, strength endurance, agility, explosive power, speed, cardio vascular endurance.

Hypothesis 2: There would be significant difference among college, district and university handball players on selected physical fitness variables such as strength, strength endurance, agility, explosive power, speed, cardio vascular endurance.

Hypothesis 3: There would be significant difference among college, district and university basketball players on selected personality traits such as sixteen personality factor.

Hypothesis 4: There would be significant difference among college, district and university handball players on selected personality traits such as sixteen personality factor.

Hypothesis 5: There would be significant difference between college basketball and handball players on selected physical fitness and personality traits (sixteen personality factor).

Hypothesis 6: There would be significant difference between district basketball and handball players on selected physical fitness and personality traits (sixteen personality factor).

Hypothesis 7: There would be significant difference between university basketball and handball players on selected physical fitness and personality traits (sixteen personality factor).

1.20 SIGNIFICANCE OF THE STUDY

The ultimate goal of research in physical education is to help coaches and physical educators to train their players based on new concepts to improve their performance. The results of the study may be useful to the professional colleagues of physical education and sports in the following ways.

1. The findings of the study add the existing knowledge with regard to the selected variables among selected players.

2. The results of the study may provide guideline, which will help the physical educators and coaches in preparing the training schedules for their players in their respective games.

3. The finding of this study will add to the quantum of knowledge in area of sports.

4. The study may help to assess the status of physical and psychological variables among university basketball and handball players.

5. The study may help to assess the status of physical and psychological variables among college basketball and handball players.

6. The study may help to assess the status of physical and psychological variables among district basketball and handball players.

7. A unique aspect of this work is that it includes recommendations for the practical use of research findings.

8. This study may assure players to know his or her capacity for further improving the performance.

9. This study may bring a change in the views of the player on psychological and physical abilities.

10. The research finding would bring to light the effectiveness of physical fitness and personality traits to increase the performance of players.

11. This study would create an awareness related to physical fitness and personality traits.

1.21 DEFINITION OF TERMS

1.21.1 Basketball

Basketball is a sport played by two teams of five players on a rectangular court. The objective is to shoot a ball through a hoop 18 inches (46 cm) in diameter and 10 feet (3.0 m) high mounted to a backboard at each end. Basketball is one of the world's most popular and widely viewed sports (**Griffiths, Sian., 2010**).

1.21.2 Handball

A game in which two teams of seven players try to throw a ball in to their opponent's goal ("**A game**", 2012).

1.21.3 Physical Fitness

Physical fitness is a set of attributes that people have or achieve that relates to the ability to perform physical activity (**James.R. Morrow., Allen W.Jackson., James G.Disch., & Dale P.Mood., 2000**).

1.21.4 Strength

Knuttgen, H., & W.Kraemer., (1987) defined strength that is the maximal force that a muscle or muscle group can generate at a specified velocity.

1.21.5 Strength Endurance

The ability of a muscle or group of muscles to overcome resistance or to act against resistance for longer duration under conditions of fatigue or tiredness (**Singh., 1991**).

1.21.6 Agility

Agility is the capacity to change the direction quickly and to control movements (**Singh., 1991**).

1.21.7 Leg Explosive Power

It is the quality of a muscle to contract forcefully in the quickest possible time **(Barry L. Johnson and Jack K. Nelson., 1982).**

1.21.8 Speed

Speed of movement shall thus be defined as the rate at which a person can propel his body or parts of his body through space **(Barry L. Johnson & Jack K. Nelson., 1982).**

1.21.9 Cardiovascular Endurance

Cardiovascular endurance is the ability of the lungs and takes in and transport adequate amounts of oxygen to working muscles which allows activities involving large muscle groups to be sustained for long period of time **(Edward L. Fox., 1984).**

1.21.10 Personality traits

Habitual patterns and qualities of behavior of any individual as expressed by physical and mental activities and attitudes; distinctive individual qualities of a person, considered collectively called as personality. Traits are defined as "a distinguishing quality or characteristic, as of personality. Personality traits are the unique set of characteristics and qualities that only you possess. While a lot of people might have similar personality traits, each person combines these traits in a different way, to create one unique, irreplaceable conglomeration of traits that make up their individual personality **(Russell, M, & Karol, D., 1994).**

1.21.11 Cattell's Sixteen Personality Factor

1.21.11.1 Factor A –The tendency to be warmly involved with people versus the tendency to be more reserved socially and interpersonally

-A people tend to be more cautious in involvement and attachments. They tend to like working alone, often on mechanical or intellectual or artistic pursuits.

+A people like working with people and are comfortable in situations where contact with others is required. Extreme scorers may be uncomfortable in situations where the close relationships they seek are unavailable

1.21.11.2 Factor B –the ability to solve problems using reason or intelligence.

-B people prefer problems be clearly spelled out and a solution readily available (algorithmic). Transfer of knowledge from one situation to the next is more difficult for them.

+B people tend to prefer to figure problems out for themselves. They more easily transfer principles from one situation to another.

1.21.11.3 Factor C –Feelings about coping with day-to-day life and its challenges

-C people feel a certain lack of control over life and tend to be more reactive to their surroundings. They tend to dwell on negative occurrences, and may worry about not meeting their own expectations and the expectations others may have on them. (especially with high A)

+C people feel more in control of their life and surroundings. They take a more proactive approach in dealing with life stresses and emotions are managed effectively. They recover from upset easily and report feelings satisfied with their day's accomplishments. Extreme scores may reflect a defensiveness or unwillingness to report "negative" experiences.

1.21.11.4 Factor E –the tendency to exert one's will over others versus accommodating others' wishes.

-E people tend to avoid conflict by acquiescing to the wishes of others. They are self-effacing and willing to set aside their wishes and feelings.

+E people tend to be dominating and aggressive in imposing their will onto other people. They are forceful, vocal, and pushy in obtaining what they want. They offer their opinions even when not asked and they feel free to criticize others. Extreme levels can alienate people who do not wish to be dominated. (Not necessarily assertiveness)

1.21.11.5 Factor F –measures exuberance and the natural self-expression exhibited by children before they learn self-control.

-F people take life more seriously, are quieter, more cautious, and less playful. They tend to inhibit their spontaneity sometimes to the point of appearing constricted. They may be perceived of as mature, but not fun or entertaining.

+F people are enthusiastic, spontaneous, and attention seeking. They are drawn to stimulating social situations. Extreme scores may reflect a flighty quality that is seen as unreliable or immature.

1.21.11.6 Factor G –addresses the extent to which cultural standards of right and wrong are internalized and used to govern behavior.

-G people eschew rules and regulations, due to a poorly developed sense of right versus wrong, or because their morals are not solely based on social convention. They often need autonomy or are inherently rebellious and anarchical in nature. They believe most rules can be broken with good reasons and become irritated when told to follow minor safety rules.

+G people are compliant, strict, and rule-conscious. They tend to think carefully about what's right and proper in making a decision and they believe people should strictly adhere to moral standards. They respect rules and good manners over being free to do what they want.

1.21.11.7 Factor H –measures social boldness or shyness

-H people are socially timid, cautious, and shy. They find speaking in front of a group a difficult experience. Their shyness may or may not be related to low self-esteem or lack of confidence. They report feeling embarrassed when initiating a conversation with strangers.

+H people are bold and adventurous in social groups and show little fear of social situations. They are not shy to initiate social contacts and may have a need to self-exhibitionism. They seem to fit in easily to a new social situation.

1.21.11.8 Factor I –focuses on peoples' sensitivities and sensibilities.

-I people tend to be utilitarian evincing less sentimentality, and attending more to how things work. These people may have difficulty dealing with sensitive situations and feel more comfortable reading a technical manual and are interested in mechanical things and how to fix things.

+I people are empathic and sensitive to the rights, feelings, and needs of other people. High scorers are more refined in their interests. They may report enjoying the beauty of a poem to the strategy of a football play.

1.21.11.9 Factor L –relates to the tendency to trust versus being vigilant about others' motives.

-L people tend to expect fair treatment, loyalty, and good intentions from others. Low scorers report a sense of well-being and satisfactory relationships, but extremely low scores can be easily taken advantage of and victimized.

+L people are vigilant and may have a hard time moderating their vigilance when it might be advantageous to do so. Extreme scorers mistrust may manifest as animosity and paranoia. They believe it is typical for people to say one thing and then do quite another.

1.21.11.10 Factor M –addresses the type of things to which people give thought and attention.

-M people are grounded in their senses, observable data and the outer realities of their environments. They think in practical and down-to-earth ways, and may struggle to generate new solutions to problems they encounter. They may be so concrete and literal as to “miss the forest for the trees”.

+M people are more oriented to internal processes and ideas. They are more abstract in their thinking and typically use more creativity and imagination in solving problems. They may tend to get lost in thought. Extreme scorers can become so consumed by their thoughts they become preoccupied.

1.21.11.11 Factor N –assesses the tendency to be personally open versus private and non-disclosing.

-N people tend to “put all the cards on the table” and talk about themselves readily and openly. They are genuine and self-revealing and forthright. Extreme scorers may have trouble playing too much on the line about themselves when it might not be advantageous to do so.

+N People are non-disclosing and private about themselves. They are personally guarded and maintain their privacy at the expense of establishing and maintaining quality relationships. People find them hard to get close to.

1.21.11.12 Factor O –measures ones approach to occurrences in their lives

-O people are self-assured and not prone to apprehensiveness nor troubled by their sense of self-adequacy. They are confident and self-satisfied, however, in extreme low scores, they miss learning opportunities by maintaining extreme confidence in themselves even in times where humility would serve them.

+O people worry and feel apprehensive about things. They tend to be insecure when approaching problems to life's challenges. Often their apprehensiveness limits their social presence and is concerned that if they do the wrong thing, people will not like them.

1.21.11.13 Factor Q1 –measures openness to change

-Q1 people tend to prefer traditional ways at looking at things. They don't question the ways things are done. They prefer life to be predictable and familiar, even if life is not the ideal. People with different viewpoints may be threatening.

+Q1 people tend to think of ways to improve things and they enjoy experimenting with the status quo. If things are unsatisfactory or dull, they seek change. These people find individuals with differing viewpoints exciting and interesting.

1.21.11.14 Factor Q2 –tends to be about maintaining contact or proximity to others

-Q2 people are group-oriented, prefer to be around others and they like doing things with other people. They prefer team sports and activities.

+Q2 people tend to be more self-reliant and enjoy time alone. They prefer to make decisions by themselves and may have difficulties working in groups. They struggle in asking for help when it is needed.

1.21.11.15 Factor Q3 –addresses one’s tendency toward perfectionism versus tolerance of disorder

-Q3 people leave more things to chance and tend to be comfortable in a disorganized setting. They may be perceived as lackadaisical, unorganized or unprepared and they may not be able to muster a clear motivation for behaving in planful or organized ways, especially if these behaviors are unimportant to them.

+Q3 people tend to be organized, neat, and keep things in their proper places. They plan ahead and are prepared for many different contingencies. They are more comfortable in highly organized and predictable situations and may have a hard time dealing with unpredictability.

1.21.11.16 Factor Q4 –is associated with nervousness and tension

-Q4 people are calm and relaxed with their surroundings. They are patient and slow to become frustrated. At the extreme, they can be difficult to motivate and disinclined to change, even for the better.

+Q4 people tend to be, restless, fidgety, and impatient. Extreme scores reflect irritability, while more moderate scores represent high levels of motivation and energy for change. They may be easily frustrated and get annoyed by changes in plans. They are not good at waiting for something (Russell, M, & Karol, D.,1994).