



## PHYSICAL EDUCATION AND SPORTS SCIENCES THE IMPLEMENTS FOR EFFECTING SPORTS PERFORMANCE

**Satpute S.R.**

Shrikrishna Sharirik Shikshan Mahavidyalaya, Wardha (M.S) India

### Abstract:

#### Introduction:

##### Physical education:

The word Physical education is derived from two separate words 'Physical' and 'Education'. The plain dictionary meaning of word physical is related to body, it may relate to any one or all the bodily characteristics. It may be physical strength, physical endurance, physical fitness, physical appearance or physical health. The word 'education' means systematic instructions or training, or preparation for life or for some particular task. A combined meaning of these two words would be that systematic instructions or training which relate to physical activities or program of activities, necessary for development and maintenance of human body, development of physical power or cultivation of physical skill. Education is a doing phenomenon, one learns through doing. Education is not confined to classroom alone; it may take place on the play ground, in library, or even at home. Such an education is conducive to the enrichment of an individual's life. A well directed program of physical education leads to healthful living, social efficacy, good physical health and worthy use of leisure time.

##### Sports science :

Sport science is a discipline that studies how the healthy human body works during exercise, and how sport and physical activity promote health from cellular to whole body perspectives. The study of sport science traditionally incorporates areas of exercise physiology, sports psychology, anatomy, biomechanics and biochemistry

(kinesiology). Sport scientists and performance consultants are growing in demand and employment numbers, with the ever increasing focus within the sporting world on achieving the best results possible. Through the study of science and sport, researchers have developed a greater understanding on how the human body reacts the exercise, training, different environments and many other stimuli.

Opportunities for graduates in these fields employment as a physical education teacher, dietician or nutritionist, performance analyst, sports coach, sports therapist, fitness center manager, sports administrator, strength and conditioning specialist or retail manager of a sports store. Graduate may also be well positioned to undertake further training to become an accredited physiotherapist, exercise physiologist, research scientist and sports medical doctor.

##### Nutrition:

Nutrition is the science that deals with food and its uses by the body. We like all other living things need good to live. Food supplies the energy for every action we undertake from eating banana to running a race. Food also provides material that our body needs to build up and repair its tissues and to regulate the functions of its organs and systems. To keep our body cells running properly, they must be supplied with correct amount food having required chemicals in ratio in the food. The chemical in the food, which our body needs are called nutrients. What we eat directly affects our health. A proper diet helps in prevention of

certain illnesses and also helps in recovery from disease/injuries. An inadequate or improper diet increases the risk of different diseases. Eating a balance diet is the right way to have all the nutrients that our body needs.

#### **Daily energy requirements:**

Personal energy requirement basic energy requirement + extra energy requirement. Basic energy requirement: - for every kg of body weight 1.3 calories of energy is required every hour (an athlete weighing 50 kg would require  $1.3 \times 24 \text{ hrs} \times 50 \text{ kg} = 1560$  calories / day)

#### **Extra energy requirement:**

For each hour of training you require 8.5 calories of energy for each kg of body weight. (for a two hour training session our 50 kg athlete would require  $8.5 \times 2 \text{ hours} \times 50 \text{ kg} = 850$  calories) an athlete weighing 50 kg who trains for two hours would require an intake of approx 2410 calories.

#### **Nutrients balance:**

Carefully balanced nutrition must provide an energy balance and a nutrient balance. The nutrients are:

- Carbohydrate: our main source of energy.
- Proteins: essential growth and repair of muscles and other body tissues.
- Fat : A source of energy which is impotent in relation to fat soluble vitamins.
- Vitamins: Water and fat soluble groups play important role in many chemical processes) in the body.
- Minerals: these inorganic elements occurring in the body and which are critical to its normal functions.
- Water: essential to normal body functions as a vehicle for carrying other nutrients and because 60% of the human body is water.

#### **Sports injuries:**

Every day millions of people in the world participate in games and sports activities, from soccer field to softball diamonds and kabaddi court. It is called playing, but sports activities are more than play. Participation in sports improves physical fitness, coordination, and self discipline, and gives children/individuals valuable

opportunities to learn teamwork. Games and sports can also result in injuries- some minor, some serious, and still others resulting in lifelong medical problems. Young athletes taking part in games/sports/physical activities are in majority and they are not merely small adults. Their bones, muscles, tendons and ligaments are still growing, which makes them more susceptible to injury. Growth plates the area of developing cartilage where bone growth occurs in youngsters- are weaker than the nearby ligaments and tendons.

#### **Basic steps to reduce the risk of sports injuries:**

- Overall conditioning is essential, it can help sportsperson avoid injury and it also enhances rehabilitation and shortens the down time of sports person/athlete.
- Every athlete should receive a pro participation physical examination, including a general medical examination and an orthopedic examination.
- Athlete should 'work with coaches and sports trainers/expert around the year to ensure they maintain their condition with appropriate exercises and nutrition.
- Sports persons should focus on developing muscular strength and endurance, cardiovascular fitness and flexibility.
- Good nutrition is a must. Incorporate the basic food groups that is grains, fruits and vegetables, dairy and meat/poultry/fish.
- Limit workouts and practices to maximum two hours.
- The night before an event sportsperson should hydrate with electrolyte fluids to reduce the risk of dehydration.
- All sportspersons should use appropriate equipment that fits properly in practices as well as competitions.
- Ice should be available on the sidelines of every game/match and practice to apply to appropriate injuries.

#### **The Implements effect for sports performance**

##### **Intelligence :**

Intelligence is the aggregate mental capacity or energy of an individual to not

purposefully, to think rationally, and to deal effectively with ones environment. Intelligence involves awareness is goal directed and has value. It is an ability to undertake the activities that are difficult, complex and which lead to the creation of something new and different. Intelligence of an individual plays an important role in affecting physical performance. The more complex and the more interpretative the movement, the greater the amount of intelligence necessary to comprehend- Sport activities involves complex skilled action.

**Attitude:**

Are about thoughts and feeling. Attitude is often thought to predict behaviour. Attitudinal responses are also evaluative in nature. They are significant in deciding the kind and extent of the learning that takes place and reflect the likes and this likes concerning specified objects of action. For example, if a child says “I like running”, it reflect attitude toward running and if child says “I don’t like running” it show child attitude toward running. Attitude involves knowledge and beliefs. Attitude are developed through direct experience and inter personal communication.

**Motivation :**

Motivation is a force, drive which prompts compels, and energizes an individual to act or behave in a particular manner, at a particular time, for attaining the specific goal or propose. In the absence of motivation either there will be no learning or very little learning, and the learned activity or skill will be forgotten very soon. Motivation is the first requisite of efficient learning. Motivation is basic to overcome the hurdles which otherwise could have influenced the performance negatively. Without proper attention keen interest setting of right attitude and the resulting optimum level of motivation, many top class athletes have failed to accomplish their task. It is thus necessary to find out ways and means of motivating athletes for better physical performance.

**Aggression:**

Aggression is a part of human behaviour and is necessary for an individual to live and struggle for higher achievements/Struggle for supremacy dominance and excellence in sports obviously involves aggression. Aggression in one form or the other is inevitable and inescapable in spots activities. When hostility takes over aggression, the situation becomes behaviour. Aggression many help into performance of an athlete because it arouses the athlete to reduce and control aggression in order to play calmly and perform the best. Appropriate level of aggression as permitted under the rules governing the game tend to improve the skill and enhance the effort and on the other hand, high or low level of aggression will hamper and retard the performance in sport.

**5. Arousal and Activation:**

The term arousal reflect the varying degrees of readiness to perform physical intellectually or perceptually. Activation is a short term change of energy mobilization, and implies raising of energy above an individual arousal baseline for a brief period. Arousal and activation are the bodily states and feeling that indicate the degree to which an athlete is physically and emotionally ready to perform. With appropriate levels of activation and arousal athletes tend to see better, think more clearly, and concentrate longer regarding the impending situations. Over-excitement, over activation and over-arousal of an athlete may result in reduction of performance, or even in an inability to perform at all, whereas optimum levels of arousal and activation at the relevant time may definitely help in better performance. It is, therefore necessary to know what are the real.

**6. Attention and concentration:**

Attention is the concentration of consciousness upon one object rather that upon another. It is the process of getting an object or thought clearly before the mind. It helps in bringing mental alertness and preparedness, and as a result, one becomes

alert and alive and tries to exercise one's mental and physical power as effectively as possible. Giving high quality attention to the skill / task during sports competition is important for effective performance. Various cognitive strategies and intensive over learning of skills may enhance the capacity to focus attention on the task at hand, resulting in better performance. There number of factors which distract and reduce attention and concentration, which in turn will result in poor performance.

### **7. Mental imagery :**

Mental ability and imagery help the athletes mould their emotional state, and the way they approach the physical efforts. Such mental activity enables the athletes to improve the execution and precision of the given skill or task by thinking and imagining about it. Mental imagery of critical competitive situations is essential to boost the fighting spirit to help an athlete to organise himself in a better way. Mental rehearsal of competitive situations certainly help in improving athlete's emotional state as well as his physical performance. It also helps in the smooth flow of energy and when required.

### **8. Group Dynamics :**

A sports team comprises of various individual athletes, each having different orientations and perceptions and at times, these differences may interfere with performance of the team. Better performance will result if each member of the team merges his personal feelings and abilities into a total team effort. Success of a team depends on adjustment within i.e, how closely the team seems to be working and feeling together. Psychological togetherness among the outcome of the performance. Group dynamic and performance are thus mutually influential, and are further influenced by the order of the stability of has been found that better group cohesion generally tends to produce better performance.

### **Sports training:**

The training is the process of preparing an individual's for any event or an activity or

job. Usually in sports we use the term sports training which denote the sense of preparing sportspersons for the highest level of performance. But now a day's sports training is not just, a term but it is very important subject that affects each and every individuals who takes up physical activity or sports either for health and fitness or for competition at different level. Hence sport training is the physical, technical, intellectual, psychological and moral preparation of an athlete or a player by means of physical exercise.. The aim of sports training in competitive sports, the following objectives of sports training may be set to reach the aim.

- Personality development
- Skill/technique development
- Mental training
- Physical fitness development
- Tactical development.

### **Sports Psychology:**

Sports psychology is the scientific study of people and their behaviors in sport contexts and the practical application of that knowledge. Sport psychologists identify principles and guidelines that professionals can use to help adults and children participate in and benefit from sport and exercise activities in both team and individual environments. Sport psychologists have to objectives in mind 1-to understand how psychological factors affect an individual's physical performance and 2-to understand participation in sport and exercise a person's psychological development, health and well being.

### **Biomechanics:**

Biomechanics is the study of the structure and function of biological systems such as humans, animals, plants, organs and cells. In sports biomechanics the laws of mechanics are applied to human movement in order to gain a greater understanding of sports performance and to reduce sports injuries as well. Elements of mechanical engineering, electrical engineering, computer science, gait analysis, and clinical neurophysiology are common methods used in sports biomechanics

**Exercise Physiology:**

Exercise physiology is the study of the acute responses and chronic adaptations to a wide range of physical exercise conditions. In addition, many exercise physiologists study the effect of exercise can reduce or reverse disease progression. Accreditation programs exist with professional bodies in most developed countries, ensuring the quality and consistency of education. An exercise physiologist area of study may include but is not limited to biochemistry, bioenergetics, cardiopulmonary function, hematology, biomechanics, skeletal muscle physiology, neuroendocrine function, and central and peripheral nervous system function.

**Anatomy:**

Anatomy is the branch of biology concerned with the study of the structure of animals and their parts- It is also referred to as zootomy to separate it from human anatomy. Human anatomy includes the study of the structure of the skeleton, muscles nerves, blood vessels and the various organs of the human body. Knowledge of the structure of the human body is essential for an understanding of its functions.

**Conclusion:**

Physical Education and Sports Sciences is an important ingredient of sports training

programme and deals with the way in which various Physical Education and Sports Sciences states and traits influence sports performance. It is the application of psychology to the issues and problems in the field of sports as the problems of sports persons are quite unique, different, subtle and complex. Therefore the main purpose of Physical Education and Sports Sciences is to understand the behaviour of an athlete, to modify it according to the demands of situations, and to optimize the benefit for elite performance and excellence. According to Singer, "sports psychology encompasses various branches of psychology as they are related to our ability to understand athlete performance, how to make it better and how to improve exercise programmes."

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