

**Vocational Higher Secondary
Education (VHSE)**

Second Year

PHYSICAL EDUCATION

Reference Book



Government of Kerala
Department of Education

State Council of Educational Research and Training (SCERT),
KERALA
2016

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Typesetting and Layout : SCERT

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Foreword

Dear Learners,

This book is intended to serve as a ready reference for learners of vocational higher secondary schools. It offers suggested guidelines for the transaction of the concepts highlighted in the course content. It is expected that the learners achieve significant learning outcomes at the end of the course as envisaged in the curriculum if it is followed properly.

In the context of the Right- based approach, quality education has to be ensured for all learners. The learner community of Vocational Higher Secondary Education in Kerala should be empowered by providing them with the best education that strengthens their competences to become innovative entrepreneurs who contribute to the knowledge society. The change of course names, modular approach adopted for the organisation of course content, work-based pedagogy and the outcome focused assessment approach paved the way for achieving the vision of Vocational Higher Secondary Education in Kerala. The revised curriculum helps to equip the learners with multiple skills matching technological advancements and to produce skilled workforce for meeting the demands of the emerging industries and service sectors with national and global orientation. The revised curriculum attempts to enhance knowledge, skills and attitudes by giving higher priority and space for the learners to make discussions in small groups, and activities requiring hands-on experience.

The SCERT appreciates the hard work and sincere co-operation of the contributors of this book that includes subject experts, industrialists and the teachers of Vocational Higher Secondary Schools. The development of this reference book has been a joint venture of the State Council of Educational Research and Training (SCERT) and the Directorate of Vocational Higher Secondary Education.

The SCERT welcomes constructive criticism and creative suggestions for the improvement of the book.

With regards,

Dr. P. A. Fathima
Director
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ABOUT THE COURSE

As physical education is related to health, a wider scope has emerged in this area as never before. The course "Health and Physical Education" aims to inculcate in students the values and the skills required in the field of physical education). It is divided into four modules and these modules equip the students to learn the trade in line with the need of the market.

Apart from equipping the students to become physical education teachers in schools, this course also targets emerging jobs in the areas related to fitness, recreation, relaxation, and commercial sports. Students can opt to work in the field of fitness, commercial sports bodies, yoga, sports tourism, sports journalism, sports shops, health clubs, and event management in sports, online blogging and wellness clinics. The modules are framed keeping an eye on these job opportunities.

Apart from securing the employability of students this course also aims at moulding the pupil into a well-balanced personality. The physical fitness developed through scientific physical training and the emotional and social values developed as a result of taking part in various team games will develop leadership qualities in students and help them to be good human beings.

Major Skills (With Sub Skills)

1. Health and Fitness Management
2. Health and Yogic Science

Sub skills

- Sports injury management
- Improvement of fitness components
- Practical knowledge of Yogic asana,Pranayama,Meditation,Satkriyas & Mudras
- Aerobics
- Knowledge of resistance training
- Knowledge of major games
- Formal teaching practice
- Corrective exercise for postural deformities
- Sports nutrition
- Psychological techniques for performance improvement
- Organization & administration of major tournaments
- Specialisation in any one major game

Module 3

Syllabus

Physical Education - Theory Health and fitness management

Unit 3.1. Growth And Development.

Growth and development- meaning, various stages of growth and development- infancy, childhood, adolescence, adulthood, later adulthood. Factors affecting growth and development.

(12 Periods)

Unit 3.2. Sports Training

Sports training- definition, Training load, adaptation, super compensation. Principles of training.

(13 Periods)

Unit 3.3. Physical Fitness And Wellness

3.3.1 Physical fitness- definition, wellness- definition, Health - related physical fitness and its components, skill - related physical fitness and its components.

3.3.2 Types of strength, Speed abilities.

3.3.3 Importance of warming up and cooling down. (17 Periods)

Unit 3.4. Development Of Physical Fitness

3.4.1 Development of strength. Resistance training, plyometrics, circuit training. Development of endurance- continuous method, interval method, repetition method, competition method. Development of speed abilities. Development of flexibility-ballistic method, slow stretch and hold method, PNF stretching.

3.4.2 Training cycle-Micro cycle, Meso cycle and Macro cycle. Periodisation (35 Periods)

Unit 3.5. Drugs And Doping

Drugs- meaning, Drugs commonly used by sportsman and its effects, ill effects of drug abuse, Blood doping. (10 Periods)

Unit 3.6. First Aid And Sports Injury Management

Skin injuries and its management- (abrasion, lacerations, incision, puncture wound,

blisters). Soft tissue injuries and its management- (confusion, strain, sprain, overuse injuries). Bone injuries and its management - (fracture, dislocation). (15 Periods)

Practical

Unit 3.7. Resistance Training

Various resistance training methods using own body weight, barbells, dumbbells, machines and medicine balls. Ordering the exercise, fixing frequency, intensity, repetition, sets, and rest. (35 Periods)

Unit 3.8. Aerobics

Rhythmic movements, synchronized movements by count, rhythmic with music, aerobics with box. (30 Periods)

Unit 3.9. Swimming

Floats, Freestyle, Back stroke, Breast stroke, Butterfly stroke. (15 Periods)

Unit 3.10. Track And Field

Skills of Triple jump, Pole vault, Discus throw, Hammer throw, Javelin throw. Marking and officiating of field events- Javelin throw, Shot put, Discus throw, and Hammer throw. (30 Periods)

Unit 3.11. Badminton

Court marking and measurements. Skills- Grip, Fore hand drive, Back hand drive, Clear, Service, Drop shot, Smash. Officiating. (25 Periods)

Unit 3.12. Practice Teaching

General lesson-Class formation, calisthenics, rhythmic, aerobics, exercises using light apparatus. Specific lesson. (30 Periods)

Unit 3.13. Specialization

Any one of the following game is chosen for specialization. Basketball, Hockey, Volleyball, Athletics, Taekwondo, Football, Cricket. Officiating, teaching and coaching in specialization. (60 Periods)

Unit 3.14. Intramural

Organization of competitions in selected games. (13 Periods)

Module 4

Health And Yogic Science

Unit 4.1 Fundamentals Of Yoga

- 4.1.1 History, Introduction to classic yogic texts- Pathanjali yoga sutra, Hatha yoga pradipika, Gherenda samhitha and Goreksha samhitha.
- 4.1.2 Meaning and definition of Yoga, Introduction to Yoga therapy
- 4.1.3 Astanga Yoga (Pathanjali Yoga)
- 4.1.4 Satkriyas (cleansing process) Neti, Douthi, Nouli, Basthi, Kapalabathi and Trataka. Mudras and Bandas.
- 4.1.5 Asanas (postures) -Meaning and definition, Number of Asanas in different traditional Yogic texts.
- 4.1.6 Pranayama - Physiology of breathing. Types of breathing- Chest breathing, Abdominal breathing.
- 4.1.7 Meditation (Dhyana)- meaning, Different types of meditation.
- 4.1.8 Difference between Yogic asanas and physical exercises. Yogic practices for lifestyle diseases- Diabetics melitus, Blood pressure, Obesity.
(25 Periods)

Unit 4.2 Health Education

Health- meaning, definition. Components of Health, Scope and importance of health education.
(12 Periods)

Unit 4.3 Posture And Corrective Measures

Meaning and definition of posture. Importance of good posture. Causes of poor posture. Postural deformities- Flat foot, Knock knee, Kyphosis, Lordosis, Scoliosis. Corrective exercises for the deformities. Causes of postural deformities. (15 Periods)

Unit 4.4 Sports Nutrition

Nutrients; Energy nutrients and its role during physical activity, Aerobic and anaerobic energy, Balance diet, diet before, during and after physical activities, water loading.
(20 Periods)

Unit 4.5 Sports Psychology

- 4.5.1 Meaning of sports psychology. Psychological factors effecting sports performance
- 4.5.2 Personality - meaning, personality traits. Role of sports in developing personality
- 4.5.3 Motivation - meaning, types of motivation. Role of teacher in motivating students.
(20 Periods)

Unit 4.6 Sociology

- 4.6.1 Meaning of sociology. Role of play and sports in socialization process.
- 4.6.2 Recreation- meaning, Characteristics of recreation, Objectives of recreation.
(10 Periods)

Practical

Unit 4.7 Yogic Science

- 4.7.1 Asanas - Sitting asanas, Standing asanas, Prone lying, Supine lying, Twisting asanas, Forward bending asanas Backward bending asanas.
- 4.7.2 Pranayama - Suryabedhana, Ujjayi, Sithali , Sithakari, Bramari, Plavini, Muurcha, Basthrika.
- 4.7.3 Mudra - Chin mudra, Jnana mudra, Viparit karani mudra.
- 4.7.4 Kriyas - Neti, Douthi, Nouli, Basthi, Kapalabathi and Trataka.
(70 Periods)

Unit 4.8 Cricket

Court marking and measurements, Skill - Grip, Stance, Forward and Backward defense, Drive, Catching, Fielding, Bowling, Rules and regulations and Officiating
(25 Periods)

Unit 4.9. Kho-kho

Court marking and measurements, Skill - Sitting in the square, Giving kho, Tapping, Diving, Chasing, Running , Rules and regulations and Officiating (25 Periods)

Unit 4.10. Handball

Court marking and measurements, Skill - holding the ball, passing skills, catching skills, dribbling, throw shots. Rules and regulations and officiating. (25 Periods)

Unit 4.11 Specialization

Any one of the following games are chosen for specializations. Basketball, Hockey, Volleyball, Athletics, Taekwondo, Football, Cricket. Officiating, teaching and coaching in the specialization. (60 Periods)

Unit 4.12 Intramurals

Organization of competitions in selected games. (33 Periods)

PART- B

MODULE III

OVERVIEW

This module aims to inculcate certain skills in the learner to manage a gymnasium or health club. He or she will acquire knowledge of resistance training of various types, the exercises required to develop different muscle groups, the load factors required to develop variety of strength qualities etc. This module also gives training to the learner to develop fitness, which is turning to be the primary need of the society.

The learner will also understand various sports related injuries and its management. This helps to prevent the aggravation of injuries and also to rehabilitate the injuries faster.

It has become the trend of the younger generation to be muscular in a short span of time that leads to the illegal and unhealthy practices such as using harmful drugs. Many sportsmen has been caught and banned for using such drugs to enhance their performance. This module will elaborate the ill effects of drug usage and the damages it is causing to the mankind.

MODULE III

UNIT - 1

GROWTH AND DEVELOPMENT

Introduction

Human being is never static. From conception to death, change is constantly taking place in his physical and psychological capacities. The two words 'growth' and 'development' are often used to describe these constant changes.

Learning out comes

On completion of this this, the learner will be able to :

1. Analyse the changes at various stages of growth and development.
2. Identify various factors affecting growth and development.

Meaning of growth and development

The term 'growth' refers to dimensional augmentation, cellular multiplication or quantitative changes in size, weight and number. 'Development' involves a series of progressive, orderly and meaningful changes leading to the goal of maturity.

Crow and Crow observe that "growth refers to structural and physiological changes while development refers to growth as well as changes in behavior." Growth and development are correlated because both occur together.

Various stages of growth and development

1) Infancy

This period extends up to when the child is two years old. The weight and height of children of the same age may vary greatly but the pattern of growth and all the processes are orderly and are continuous. At this stage the new born baby is about 9 to 20 inches long. The male babies are generally a little longer than the female babies. The growth of nervous system during this period mainly consists of the development of immature nervous cells which are present at the time of birth. As the brain of the child matures and its function becomes more organized, many automatic reflexes disappear and are replaced by voluntary motor behaviors. The parent/child relationships dominate the social world of the infants and it serves as a training ground for his social and emotional growth. This is the period of self assertion and the child begins to resist attempts to thwart his needs, or too much adult interference with his activities.

2) Childhood

Childhood begins when the relative dependency of infancy is over and extends to the time when the child reaches sexual maturity. It approximately extends from the age of two to thirteen years. During the long period many physical and psychological changes take place. Early childhood starts from the second year and extends up to the sixth year and the late childhood extends from sixth year till he becomes adolescence. During the entire childhood growth proceeds at a more or less uniform rate with yearly weight increase of about two to three kilograms and height increase of about two to three inches.

3) Adolescence

Adolescence is a process rather than a period, a process of achieving the attitudes in society. This stage between childhood and adulthood is called adolescent period. This period of passage from childhood to adulthood is a time of dramatic physical, cognitive and social changes. Adolescence is a period of stress and strain. Puberty is the first stage of adolescence when a child initiates his steps towards adulthood. Primary sex characteristics are developed during this period. The development of physical and physiological abilities during this period provides ample opportunities for growth of mental abilities to deal with abstract matters more easily. This phase also evidences considerable growth in certain internal organs. The changes which occur during adolescence have important bearing on their social life. Partly because they become more mature physically and mentally and partly because they are expected to seriously prepare themselves for adult role in near future.

4) Adulthood

The periods of infancy, childhood and adolescence are all preparation for entry into adult life. They are now ready to face the challenges of life. Physiologically, the

young adults are at their peak, and their strength, endurance, reaction time, perceptual abilities and sexual responsiveness are all optimal. This stage is also a period of cognitive functioning. By the time they reach forty years gradual decline in the body and its capacity become noticeable. Intellectual abilities remain quite stable rather show some gain.

5) Old age/ Later adulthood

With crossing over the sixties, physical, mental and intellectual decline is inevitable. Despite decline in physical and mental abilities, most of them maintain their characteristic personality traits, carry with them their own unique abilities, funds of knowledge and cope up with the challenges of aging in a graceful manner.

Factors That Influence The Growth And Development Of An Organism

There are several factors which directly or indirectly influence the growth and development of an organism. These are as follows:

1. Heredity:

Heredity is a biological process through which physical and social characteristics are transmitted from parents to off-springs. It greatly influences the different aspects of growth and development i.e. height, weight and structure of the body, colour of hair and eye, intelligence, aptitudes and instincts.

2. Environment

Environment plays an important role in human life. Psychologically a person's environment consists of the sum total of the stimulations (physical & psychological) which he receives from the time of his conception. There are different types of environment such as physical environment, social environment & psychological environment.

Physical environment consists of all outer physical surroundings both inanimate and animate, which have to be manipulated in order to provide food, clothing and shelter. Geographical conditions i.e. weather and climates form the physical environment which has considerable impact on a child as an individual

Social environment is constituted by the society-individuals and institutions, social laws and customs, by which human behavior is regulated. Psychological environment is rooted in individual's reaction with an object. One's love, affection and fellow feeling attitude will strengthen human bond with one another.

3. Sex

Sex acts as an important factor of growth and development. There is difference in the growth and development of boys and girls. The boys in general are taller and courageous than the girls but girls show rapid physical growth in adolescence and excel boys.

4. Nutrition

Growth and development of the child mainly depend on his food habits and nutrition. Malnutrition has adverse effects on the structural and functional development of child.

5. Exercise

It is a fact that repeated play and rest build the strength of the muscle. The increase in muscular strength is mainly due to better blood circulation and oxygen supply. The brain muscles develop by its own activity-play and other activities provide for the growth and development of various muscles.

6. Hormones

Hormones are physiological substances having the power to raise or lower the activity level of the body or certain organs of the body. The adrenal glands are very close to kidneys. These make a secretion of adrenaline, a very powerful hormone, which is responsible for strong and rapid heart-beat, release of stored sugar from liver and which controls blood pressure. Gonads are glands, which secrete hormones that have important effects on growth and sex behavior.

7. Learning and Reinforcement

Learning goes to help the human child in his physical, mental, emotional, intellectual, social and attitudinal developments. All knowledge and skills, all habits, good and bad, all acquaintances with people and things, all attitudes built up in dealing with people and things are learnt.

Reinforcement is a factor in learning. Exercise or activity is necessary for learning. It may be a motor activity, as in playing on a musical instrument. Or it may be a sensory activity as in listening to a piece of music. Whatsoever, there must be activity in some form. "We learn by doing". Now it is that out activity should be repeated till we get the desired results.

Assessment Activities

- Project on height/weight chart
- Discussion/Presentation about growth and development

TE Questions

1. In which age is the growth of girls rapid compared to that of boys
(a) Childhood (b) Adolescence (c) Infancy (d) Adulthood
2. Many factors influence the growth and development of a child. What is the role of a physical education teacher in the development of a child?
3. The child may grow but he or she may not develop. What is the difference between these two terms?

UNIT - 2

SPORTS TRAINING

Introduction

The word 'Training' denotes the process of preparation for some task. Sports training is done for improving sports performance. The sports performance, as any other type of human performance, is not the product of a single system or aspect of human personality. On the contrary, it is the product of the total personality of the sports person. In order to improve sports performance the social and psychic capacities of the sports person also have to be improved in addition to the physical and physiological ones. Sports training, therefore, directly and indirectly aims at improving the personality of the sportsman. Therefore, sports training is an educational (i.e., pedagogical) process.

Learning Outcomes

On completion of this this, the learner will be able to

1. Identify the training load required for adaptation
2. Apply principles of training.

Definition of sports training

Sports training are a pedagogical process based on scientific principles, aiming at preparing sportsmen for higher performances in sports competitions. (Hardayal Singh)

Training load

Sports training consist of activities and movements which generally lead to high fatigue. Fatigue is the direct product of load caused by physical activity or exercise. Fatigue is essential for starting the adaptation process in the organism which ultimately leads to increase in performance capacity. Load therefore is of central importance in sports training. Without load through physical exercises the performance cannot be improved, stabilized and maintained. Stagnation of load results in stagnation of performance.

Load is the process of tackling training and competition demands which cause temporary disturbance of psychic and physical state of homeostasis. The concept of load is not limited to training only. Competitions also cause load and are also used as training means. We can however, divide load into two categories, each having its own unique nature and effect. E.g. Training and competition load.

Training and competition demands

These demands represent the actual act of doing a physical exercise or activity under training or competition conditions. The quantum of these demands is the product of the following factors.

1. Quality of the execution of the exercise
2. Type of physical exercise or training means.
3. Intensity of load.
4. Volume of load.

Degree of load

It denotes the extent to which the various psychic and physiological functions are disturbed from their normal level of functioning i.e. homeostasis. The degree of load is also called internal load.

Load and adaptation

The process of tackling training and competition demands leads to disturbance of psychic and physiological state of homeostasis. The human organism tends to restore the state of homeostasis by causing the different systems and functions to adjust to the state of disturbance. This is simply a functional adjustment but if the homeostasis is optimally disturbed repeatedly for a number of days then the human body responds by causing structural and metabolic changes which enable the body to tolerate load more easily. This is called adaptation. This adaptation also means better performance capacity to tackle the demands which caused the adaptation. The adaptation takes place in all the organs, systems and functions which are affected by the process of tackling the training and competition demands.

Super compensation

After the termination of physical activity, the recovery process starts. The recovery process is the direct result of fatigue. Unless the fatigue crosses a certain limit the adaptation will not take place. During recovery the various tissues, organs, systems, substances etc, which were depleted or affected during the activity are again restored or normalized. The pace of recovery is however different for different organs, tissues, substances etc. The recovery, however, does not end with the achievement of the pre activity level of substances, tissues etc. It overshoots the pre activity level. This is called overcompensation or super compensation. This happens only when the load is optimum. The state of overcompensation is a temporary phase which lasts

for a few hours after which it again disappears and under compensation phase of a few hours occurs. In pendulum like fashion, the phases of over and under compensation follow each other but with progressively diminishing amplitude till everything comes back to a stable pre activity level. The state of overcompensation or super compensation is a phase of increased performance capacity for the training and competition demands which caused overcompensation. The phase of overcompensation, in the initial stages of training, is a temporary and bio-chemical reaction to load. But if the load is repeated regularly for a number of days then a more stable adaptation takes place which can last for several days. In other words, continuous and regular training leads to stable adaptation or increase in performance.

Load intensity

Intensity of load is the degree of effort being made by the sportsman while doing an exercise. The degree of effort is always considered in relation to time. It is also equated with the amount of force or energy being spent in relation to time. In different sports and physical exercises the degree of effort is judged and measured by taking into consideration different parameters, e.g. for running it is in terms of speed and in weight training it is in terms of resistance.

Load volume

The volume of load is the total amount of work done through an exercise or in a training session. For e.g. for running in terms of distance or time and for weight training in terms of total weight lifted.

Principles of sports training

Principles of sports training are the guidelines for coaches, teachers and sportspersons for the formulation, implementation and control of sports training. These are formed on the basis of knowledge gained from various sports science disciplines and successful practice.

1. Principle of formulation of training on the basis of prognostic performance and its structure

Sports training aims at achieving high performance in future. Therefore, the structure of prognostic sports performance should form the basis of formulation of training. All aims, objectives, means, methods and measures for different stages of training are to be derived from the performance capacity essential to achieve the prognostic sports performance.

2. Principle of continuity of training

This principle states that sports training should be a continuous and regular process. Continuous and regular training leads to improvement of performance capacity. But when the training is stopped for some period or there are too long intervals between

training sessions the performance capacity starts decreasing. It is, therefore of utmost importance to ensure continuity of training.

3. Principle of progression of load

A certain quantum of training load forces the organism to adapt to a certain level of psychic and physical demands. If the same load is repeated again and again then it gradually loses its value as a stimulus for adaptation. The organism adapts to this load and is in a position to tackle this load effectively and easily. In simple word this load is just good enough to maintain the achieved level of adaptation or the achieved level of performance. Higher performance will be achieved when the organism adapts to a higher level of functioning. This is possible only by increasing the load. In sports training we want continuous improvement in performance. Therefore, we have to keep on increasing the training load from time to time or periodically.

4. Principle of uniformity and differentiation

In order to achieve best results, the sports training should be formulated uniformly but allowing for individual differences. To start with the training should be predominantly for all in order to sport talent. Uniformity also means that training for all should be based on the same principles and system which have been worked out to achieve the prognostic sports performance in stages. The goals, means, methods and organization of training should be uniform. With the passage of time, however, the training should become increasingly individualized considering age, sex, talent, performance etc.

5. Principle of progressive specialization

The term specialization in sports training means use of specific means and methods for improving performance in a particular sport. Specific means and methods lead to faster improvement in sports performance. But in real training process, which starts in childhood and can continue up to 25-30 years of life, the predominant use of specific means and methods throughout the long term process of training does not give good results. The sports training, in all stages and phases, should be judicious mixture of general and specific means and methods of training. To start with the training should be highly general development oriented but with the passage of time should give way to gradually increasing specialization. The high preparation of general preparation in the initial years of training ensures all round development thus creating the base for future performance. General means of training in childhood are also important for developing the various components of sports talent which can be then identified and selection for a sport can be made.

6. Principle of planned and systematic training

This principle as its name suggests actually consists of two training principles which are interrelated. Sports training is a scientific and pedagogical process and for best

results each and every part, phase and stage of training must be properly planned. It is however essential to realize that planning has to be done on the basis of a system, which has been worked out in consideration of the present available knowledge regarding best ways and means of achieving high performances through sports training. In other words correct planning of training is impossible without a thorough understanding of training systematic.

7. Principle of cyclicity of training

The process of sports training is formulated in shorter and longer cycles. The reasons for carrying out training in form of cycle are given below.

- A) In training the different tasks can not be tackled simultaneously. This has to be done in a definite sequence determined on the basis of a training system.
- B) Certain tasks of training have to be tackled again and again after certain time periods in order to achieve the desired results. This has to be based on the proper sequence of load and recovery phases.
- C) The sportsman has to participate in competitions and for successful participation he must achieve top form. Top form is developed in phases which have to be repeated after certain time period. Besides important competitions repeats themselves yearly or after definite time periods.

8. Principle of regulation of training

A coach should always know what effect the training is producing on the performance of the sportsman. If necessary the sports training should be changed or modified to ensure proper and effective development of performance. This is possible through continuous regulation of sports training.

Assessment Activities

- Assignment on training load and adaptation
- Preparation of training schedule

T E Questions

1. Practicing with a load of 30 percentage of 1 RM and another load of 80 percent of 1RM will have different impact on development of strength. What are the differences that this load may bring into the trainer?
2. As per the theory of super compensation what will happen to a person training without rest for many days. Suggest training implications to achieve super compensation.
3. Progressive specialization is an important principle of sports training. Describe the importance of this principle in view of the large burn out of sports talents in our state.

UNIT - 3

PHYSICAL FITNESS AND WELLNESS

Introduction

Physical fitness enables us to perform up to our potential. Fitness can be described as a condition that helps us look, feel and do our best. More specifically, it is the ability of the human body to function with vigor and alertness, without undue fatigue, and with ample energy to engage in leisure activities.

Physical fitness involves the performance of the heart and lungs, and the muscles of the body. And, since what we do with our bodies also affects what we can do with our minds, fitness influences to some qualities such as mental alertness and emotional stability.

Learning Outcomes

On completion of this this, the learner will be able to

1. Differentiate health related physical fitness components and skill related physical fitness components.
2. Differentiate types of strength and speed abilities
3. Recognize the importance of warming up and cooling down.

Physical fitness definition

Physical fitness is defined as "a set of attributes that people have or achieve that relates to the ability to perform physical activity." It consists of health related physical fitness and skill related physical fitness or performance related physical fitness, which have at least eleven different components, each of which contributes to the total quality of life.

HEALTH RELATED PHYSICAL FITNESS

A) Body composition

Body composition is the relative percentage of muscle, fat, bone and other tissues of which the body is composed. A fit person has a relatively low, but not too low, percentage of body fat. For optimum health, body fat should be no more than 20% of total body weight for men and 30% for women. The excess accumulation of fat in the body leads to obesity which causes many diseases.

B) Cardiovascular fitness

It is the ability of the heart, blood vessels, blood and respiratory system to supply fuel, especially oxygen, to the muscles and the ability of the muscles to utilize fuel to allow sustained exercise. A fit person can persist in physical activity for relatively long periods without undue stress.

C) Flexibility

It is the range of motion available in a joint. It is affected by muscle length, joint structure, and other factors. A fit person can move the body joints through a full range of motion.

D) Muscular endurance

The ability of the muscles to repeatedly exert themselves. A fit person can repeat movements for a long period without undue fatigue.

E) Strength

It is the ability of the muscles to act against or to overcome resistance by exerting force.

SKILL RELATED PHYSICAL FITNESS**A) Agility**

The ability to stop, start, and change directions quickly. Skiing and wrestling are examples of activities that require exceptional agility.

B) Balance

It is the ability to maintain the equilibrium while stationary or while moving. Performance on the balance beam is an activity that requires exceptional balance.

C) Coordination

It is the ability to use the senses with the body parts to perform motor tasks smoothly and accurately. Juggling, hitting a golf ball, batting a baseball or kicking a ball are examples of activities requiring good coordination.

D) Power

It is the ability to transfer energy into force at a fast rate. Throwing the discus and putting the shot are activities that require considerable power.

E) Reaction time

The time elapsed between stimulation and the beginning of reaction to that stimulation. Starting a sprint require good reaction time.

F) Speed

The ability to perform a movement in a short period of time. A runner on a track or a member of a football team needs good foot and leg speed.

Wellness

Wellness is the integration of all parts of health and fitness (mental, social, emotional, spiritual, and physical) that expands one's potential to live and work effectively and to make a significant contribution to society.

TYPES OF STRENGTH

Strength is a product of voluntary muscle contractions caused by the neuromuscular system. The strength ability can be divided into three types.

1. Maximum strength

It is the ability to overcome or to act against maximum resistance. It is measured by finding out the maximum resistance which can be overcome or the maximum force which can be applied by the muscles.

2. Explosive strength

It is a combination of strength and speed abilities. It can be defined as the ability to overcome resistance with high speed. A high percentage of movements in sports is of explosive nature and involves overcoming of some external resistance or one's own body weight. Explosive strength, therefore, is important in most of sports.

3. Strength endurance

Strength endurance is the ability to overcome resistance or to act against resistance for longer duration without fatigue.

SPEED ABILITIES

From general point of view we can have five types of speed abilities: reaction ability, movement speed, acceleration ability, locomotor ability, and speed endurance. Reaction ability in reality is not a speed ability as it depends entirely on coordinative processes. It is a coordinative ability. But traditionally, it has been considered a speed ability and the training of reaction ability is, most of the time, inseparably linked with the training of movement speed. It is, therefore, being dealt with here along with the other speed abilities. Speed endurance is an endurance ability but training of speed endurance involves training of speed. Because of this reason it has also been included under speed abilities.

1. Reaction ability

It is the ability to react effectively and quickly to a signal. In sports, signals can be of different type. E.g. visual, tactile, acoustic.

2. Movement speed

It is the ability to do a single movement in the minimum of time.

3. Acceleration ability

It is the ability to achieve high speed of locomotion from a stationary position or from a slow moving position. Performances in sprint events are determined to a great extent by acceleration ability.

4. Locomotor ability.

It is the ability to maintain, maximum speed of locomotion for maximum possible duration or distance.

5. Speed endurance.

It is the ability to do sports movements with high speed under conditions of fatigue. Speed endurance is a combination of speed and endurance abilities.

WARM UP

There are many physiological reasons for performing warm up exercises. Increased body and muscle temperature promote increases in enzyme activity and thus in the metabolic reaction associated with the energy systems. Warm up increase blood flow and oxygen availability. The more blood that reaches the muscles, the easier the delivery of nutrients required for energy production. Warming up enhances the suppleness of the muscle, enhances the speed of transmission of nerve impulses and decreases the contraction and reflex times. Abrupt intensive exercise may be associated with inadequate blood flow to the heart, preliminary exercise prevent this danger. The more blood reaching the muscles, tendons and ligaments, the better the elasticity of these tissues which means better performance and reduced chance of injuries. Warming up may reduce the likelihood of excessive muscle soreness and stiffness.

COOLING DOWN

The main aim of the cooling down is to promote recovery and return the body to a pre exercise, or pre work out level. During a strenuous work out our body goes through a number of stressful processes. Muscle fibers, tendons and ligaments get damaged, and waste products build up within our body. The cool down, performed

properly, will assist our body in its repair process. One area the cool down will help is relieving some of the effects of delayed-onset muscle soreness or DOMS (sometimes referred to as post exercise muscle soreness). When we exercise, the heart is pumping large amount of blood to the working muscles. This blood is carrying both oxygen and nutrients that the working muscles need. When the blood reaches the muscles the oxygen and nutrients are used up. Then the force of the contracting (exercising) muscles pushes the blood back to the heart where it is re-oxygenated. However, when the exercise stops, so does the force that pushes the blood back to the heart. This blood, as well as waste products like lactic acid, stays in the muscles, which in turn causes swelling and pain. This process is often referred to as "blood pooling." The cooling down helps all this by keeping the blood circulating, which in turn helps to prevent blood pooling and also removes waste products from the muscles. This circulating blood also brings with it the oxygen and nutrients needed by the muscles, tendons and ligaments for repair.

Assessment Activities

- Physical fitness test for different classes.
- Warm up and Cool down exercise chart.

T E Questions

1. Which of the following is a health related fitness component?
(a) Body composition (b) Speed (c) Agility (d) Power
2. Increase in muscle mass and decrease in fat will contribute to improve physical fitness. What component of physical fitness does it improve? Describe any two methods to improve muscle mass.
3. Warming up and cooling down have almost similar nature of physical activities. Elaborate how it differs with respect to the physiology of warming up and cooling down.

UNIT - 4

DEVELOPMENT OF PHYSICAL FITNESS

Introduction

Sports training aims at improving sports performance. Therefore the nature and structure of sports performance determines to a great extent the means and methods of training as well as the total planning, organization, implementation and assessment of training. To achieve physical fitness for higher performance different means and methods are used. These means and methods are not static in nature. These are being constantly improved, modified and new ones being discovered by the sports science disciplines. Some of the methods commonly used to improve physical fitness are mentioned in this chapter.

Learning Outcomes

On completion of this this, the learner will be able to

1. Choose various training to improve various types of strength.
2. Distinguish various training to develop endurance.
3. Differentiate direct and indirect methods of speed improvement.
4. Differentiate ballistic method, slow stretch and hold method and PNF stretching.
5. Apply periodization in a training program.

DEVELOPMENT OF STRENGTH

Strength is the most important motor ability in sports as it is a direct product of muscle contractions. All movements in sports are caused by muscle contractions and therefore, strength is a part and parcel of all motor abilities, technical skills and tactical actions. Strength and strength training therefore, assume high importance for achieving good performance in all sports. Different types of physical exercises are used with or without additional resistance to improve and maintain strength. These exercises can be broadly divided into two groups

1. Physical exercises with additional resistance

Most commonly used and most effective exercise with additional resistance are the weight training exercises. These exercises are done with additional weights E.g. Barbell, dumbbells, iron shoes etc. in addition to weight training exercises there are other exercises with additional resistance. E.g. Medicine balls, sand bags, elastic

materials etc and exercises with environmental resistance. E.g. Sand, slope, wind etc.

2. Physical exercises with one's own body weight as resistance

There are innumerable exercises in which the body weight of the sportsman acts as resistance for improving the strength. E.g. all types of jumps, pull ups, rope climbing, sit ups etc.

Core and assistance exercises

Resistance exercises can be classified as either core or assistance based on the size of the muscle areas involved and their level of contribution to a particular sport movement. Core exercises recruit one or more large muscle areas (i.e., chest, shoulder, back, hip, or thigh), involve two or more primary joints (multi joint exercises), and receive priority when one is selecting exercises because of their direct application to the sport. Assistance exercises usually recruit smaller muscle areas (i.e., upper arm, abdominals, calf, neck, forearm, lower back or anterior lower leg), involve only one primary joint (single joint exercises), and are considered less important to improve sport performance.

Repetition maximum

Load is commonly described as either a certain percentage of a 1-repetition maximum (1 RM)-the greatest amount of weight that can be lifted with proper technique for only one repetition- or the most weight lifted for a specified number of repetitions, a repetition maximum (RM). For instance, if an athlete can perform 10 repetitions with 60 kg in the back squat exercise, his 10 RM is 60 kg.

Load factors to improve different types of strength

Type Of Strength	Intensity (% 1 Rm)	Repetition	Sets	Recovery Between Sets	Speed Of Movement
Maximum strength	>85	>6	2-6	2-5 min	Moderate
Explosive strength (single effort event)	80-90	1-2	3-5	2-5 min	Fast
Explosive strength multiple effort event)	75-85	3-5	3-5	2-5 min	Fast
Strength endurance	> 67	>12	2-3	> 30 sec	Moderate

PLYOMETRICS

Plyometrics in simple terms means jump training. These are exercises in which muscles exert maximum force in short intervals of time, with the goal of increasing explosiveness.

Plyometric exercise comprises of three phases:

- **Eccentric phase**, or landing phase, involves the pre-loading (energy is stored) of the agonist muscle group by contracting eccentrically.
- **Amortization phase**, or transition phase, is the time between the concentric and eccentric phases of the take off or jump movement. This time needs to be as short as possible otherwise the energy stored during the eccentric phase dissipates, reducing the plyometric effect.
- **Concentric phase**, or take-off phase, uses the stored energy to increase the force of the movement.

Circuit training

It is a very popular and effective organizational form of doing physical exercises. In circuit training certain number of exercises is done one after the other in the form of a circuit. This circuit is repeated three or more times. Circuit training is particularly effective for the improvement of strength and endurance abilities.

A circuit can consist of 5-15 exercises. But normally a circuit consists of 6-10 exercises. The exercises in a circuit are arranged in such a manner that different muscle groups are exercised in rotation. A specific circuit, however, can consist of several exercises involving the same muscle groups. Circuit training is commonly performed in continuous or interval method. When continuous method is followed then all the exercises are done one after the other without break or the required number of circuits is completed without any pause. In interval method incomplete rest is given after each station or exercise. In between the rounds 3-5 minutes recovery is normally given. For better organization of circuit training, it is advisable to fix the time of exercise at each station e.g. 30.sec. or 45 sec. The resistance and frequency of movement should also be taken care of.

Development of endurance

Endurance is the ability to do sports movements with the desired quality and speed under conditions of fatigue. The various methods for improving endurance are basically of four types.

1. Continuous method

In this method an exercise is done for long time with out any break or pause. Because of the long duration of work the intensity is low. The continuous method has four variations.

A) Slow continuous method

In this variation the sportsman exercises at a certain speed without any pause for very long durations. In this method the pace or speed of exercise is determined according to heart rate. For trained sportsperson the heart rate during the exercise should be from 140-160 beats per minute. The volume in terms of total duration should not be less than 30 minutes. The total duration in case of endurance athletes can go up to two hours or even more. Cyclic activities like running, cycling, walking etc. are used for this method.

B) Fast continuous method

In this variation the work is done at fast but unchanging pace for long durations without any break. Heart rate is normally between 160-180 beats per minute. The total volume or duration should be not less than 20 min. for trained sportspersons. For best results the exercise should be done with a heart rate of about 175-180. Beats per minutes

C) Variable pace method

In this method the exercise is done continuously but with changing pace. The heart rate normally ranges between 140-180 beats per min. the total duration or volume ranges from about 15 min to 1 hour.

D) Fartlek method

This method is otherwise known as speed play. In fartlek the change of pace is not pre planned. The sportsman changes the speed on his own during the activity according to the terrain, surroundings and his feelings. Like variable pace method in fartlek also the heart rate fluctuates between 140-180 beats per min. the total duration and volume are also similar to variable pace method.

2. Interval method

In interval method, the exercise is done at relatively higher intensity with intervals of incomplete recovery. In interval method work should be done with sufficient speed and duration so that the heart rate goes up to 180 beats per minute. After this there should be a recovery period and when the heart rate comes down to 120-130 beats per minute the work should be started again. Interval method is of two types. Intensive

interval method and extensive interval method. In intensive interval method the intensity is from 80-90% whereas in extensive interval method the intensity is from 60-80%.

3. Repetition method

The repetition method is characterized by high intensity (90-100%) of work with intervals of complete recovery. It is the best method for the improvement of speed abilities including speed endurance.

4. Competition method

Endurance training without participation in sufficient number of competitions is incomplete. Competitions are not only essential for the improvement of specific endurance but are also important for various psychic qualities essential for good endurance performance. The competition method is used in endurance training in three different forms.

- a. Endurance tests.
- b. Competitions in other events, sports or the specific event with minor changes in distance/duration.
- c. Competition in the specific event.

Development of speed abilities

Reaction ability

General method: Playing different types of games in which quick reactions are frequently required is a general but effective method for improving reaction ability of children and beginners.

Reacting repeatedly to signal: In this method specific reaction exercises are done. The sportsman reacts repeatedly and with maximum effort to a signal e.g. sprint starts.

Movement speed

Movement speed is of importance in acyclic events and sports. E.g. throws, gymnastics, combat sports etc. in these sports the movement speed is very closely linked with technique and tactics of the sports. Depending upon the nature of speed it further depends heavily on explosive strength, flexibility, coordinative abilities, attention etc. movement speed is most frequently improved indirectly by improving technique, explosive strength and other determining factors. Movement speed can be improved directly by following method.

- a. Repeating the movement with maximum speed: the concerned movement is executed again and again with maximum speed. In some sports the concerned movement can be done several times without pause. E.g. in boxing
- b. Practicing the movement under easier conditions: the movement is executed at maximum possible speed under conditions which enable higher speed. E.g. by reducing the resistance e.g. shot put. By doing the movement on faster surface. By using external help e.g. use of jump boards.

Acceleration ability

Acceleration ability is improved indirectly by improving explosive strength, technique, flexibility etc. For the direct improvement of acceleration ability short sprints are the best means. The sprints should be done at maximum intensity for a duration of 4-6 seconds.

Locomotor ability

Locomotor ability is improved indirectly by improving explosive strength, technique, flexibility etc. For the direct improvement of locomotor ability sprints are used. The duration or distance of sprint must allow for full acceleration followed by desirable duration/distance for maintenance of maximum speed. Sprints should be done at maximum intensity for duration of 6-9 seconds.

Speed endurance

Locomotor ability is improved indirectly by improving explosive strength, technique; flexibility etc. For the direct improvement of speed endurance repetition method is done at desirable distance according to the event.

Development of flexibility

1. Ballistic method

In this method a joint is stretched rhythmically to its maximum range. The stretching movement is done with a swing hence the name ballistic method. In this method there is a higher risk of injury because of high chances of overstretching the muscle. When using this method the muscles remain in a state of optimum stretch for a fraction of a second and as a result very large number of repetitions are necessary to ensure optimum stimulus duration for improving flexibility. Ballistic method is more specific to the nature of sports movements and therefore suitable for the development of dynamic flexibility.

2. Slow stretch and hold method

In this method the joint is slowly stretched to the maximum limit and is held there for a few seconds before returning to the original position. For best effect the joint must

be held in a state of maximum stretch from 3-8 seconds. To begin with, this method should be used in a modified manner. The joint should be stretched to the maximum limit slowly and then it should be brought back to the original position without any phase of holding.

3. PNF stretching (proprioceptive neuromuscular facilitation)

This method is based on the principle that, if a muscle is contracted maximally for a few seconds then after the contraction it remains for a few seconds in a state in which it gives very low resistance to any stretch stimulus. In this method a muscle is first contracted for 6-7 seconds. The contraction should be maximal. After this the muscle is gradually stretched to its maximum limit and is held in this position for 8-10 seconds. This procedure is to be repeated 4-8 times for each muscle group.

Training cycle

In sports training there are three types of training cycles: microcycle, mesocycle, macrocycle.

1. **Microcycle** : It is the smallest training cycle and consists of 3 to 10 days. When the duration of micro cycle is seven days it is called weekly cycle. The last training session or day of a microcycle aims at recovery and relaxation. The training structure of a micro cycle is determined by its position within the mesocycle and also on the aim of the mesocycle. Effective formulation and implementation of microcycle determines the effectiveness of mesocycles and in turn that of macro cycle.
2. **Mesocycle** : Mesocycle is composed of a definite arrangement of 3-6 micro cycles or weekly cycles. The last microcycle of a mesocycle primarily aims at recovery and relaxation. A mesocycle aims at tackling of definite training tasks as part of the total process of development of performance capacity or top form. Generally a mesocycle has one or two aims which can logically be achieved in 3-6 weeks. Depending on its position in a macro cycle and on the aim of macro cycle the mesocycle can have a variety of aims. E.g. learning or perfection of technical skills, improvement of motor ability maintenance and stabilization of performance factors improved in the previous mesocycle, achievement of top form or direct preparation for a competition, recovery and relaxation and so on.
3. **Macro cycle** : This is considered the longest cycle of training. Its duration can be from 3-4 months to 12 months or even longer. Macro cycle is formed by a certain arrangement of mesocycles. In a macrocycle the last mesocycle is for-

mulated to ensure recovery and relaxation and for effective transition to the next macro cycle. Macro cycle is formulated on the principles of periodisation. The various mesocycles are so formulated and arranged that the macro cycle is clearly divided into three periods i.e. preparatory, competition and transitional period.

Periodisation

A sportsman is not in a position to give his best performance at any time during the process of training. He has to systematically train to give his best performance in a competition at particular time. If this is not done then it is most likely that he may give his best performance either before or after the competition. The process of preparing the sportsman to give his best performance in a particular competition is called periodisation. Periodisation is the systematic formulation of sports training for achieving top form in a competition at a definite time. Top form is a temporary phase of optimum performance capacity. It cannot be maintained for a long period. There are three phases of top form i.e. phase of development of training state, phase of achieving and maintaining top form and temporary loss of form.

The first phase of sport form is also called the phase of base creation. In this phase the aim is to develop the base for achieving top form at a high level in the next phase i.e. competition period. This phase corresponds to the preparatory period of periodisation. It is normally the longest period. Its duration should be from $\frac{2}{3}$ to $\frac{3}{4}$ of the total duration of the training cycle. The training in this period is characterized by high volume but medium intensity.

The second phase of sports form is called the phase of achievement and maintenance of top form. This phase corresponds with the competition period. In the competition period the aim is not to develop the base further but to create harmonious inter relationship among the already developed performance factors. The training structure in competition period depends considerably on the duration of the competition period, number and frequency of competitions and their dates and performance level of the sportsman. The training in competition period is characterized by high to maximum intensity, lower training volumes, predominant use of competition and special exercises and a high number of competitions.

The phase of achievement and maintenance of top form cannot be prolonged beyond a certain limit due to psychological and biological reasons. As a result the sports form enters into the third phase called the temporary loss of form. Transitional period corresponds to the third phase of sport form. The main aim of the transitional period

is to give recovery and relaxation to the sportsman after the hard and strenuous training in preparatory and competition period. This helps him to recover and recuperate in order to start the next training cycle. The duration of the transitional period should not be more than 4-6 weeks. Longer duration will lead to considerable loss of training state for which additional work will have to be done in the next preparatory period. The transitional period is characterized by low training volume and low training intensity. Training frequency is also less. Competition and special exercises are not used.

Assessment Activities

- Training chart/ schedule to develop strength.
- Training schedule for a week for different sportspersons.

T E Questions

1. Ballistic method improve-----(a) Strength (b) Endurance (c) Flexibility
2. Continuous method and interval method can improve endurance. Differentiate both training methods with respect to the nature of training.
3. Under which category of training the depth jumps come? What physical fitness quality does it improve?

Unit - 5

DRUGS AND DOPING

Introduction

In their never ending search for excellence and improved performance, the players have tried numerous drugs and hormones. Often the athlete has used these aids indiscriminately with complete disregards of his health and safety. These need to be addressed among youths in society and this unit aims for that.

Learning Outcomes

On completion of this, the learner will be able to

1. Point out various drugs illegally used by sportsperson and its ill effects.
2. Identify two ways of blood doping and its ill effects.

A drug is a chemical substance that, when absorbed into the body, can alter normal bodily function. Many drugs have been banned in sport if they are deemed to provide an unfair advantage, pose a health risk, or are seen to violate the 'spirit of sport'. The use of banned drugs by athletes is referred to as 'doping'. The International Olympic Committee (IOC), and more recently, the World Anti-Doping Agency (WADA) have been leading the way in the battle against drugs in sport.

Drugs commonly used by sports persons and its effect

- Ergogenic drugs, or athletic performance-enhancing drugs, mainly include stimulants (see next bullet) and lean mass builders. Lean mass builders can also reduce the time it takes to recover from an injury. This class of drugs includes anabolic steroids, xenoandrogens, beta-2 agonists, anorectics, selective androgen receptor modulators (SARMs), and various human hormones, most notably human growth hormone, as well as some of their pro drugs.
- Stimulants improve focus and alertness. Dopaminergic stimulants (e.g., reuptake inhibitors and releasing agents) also affect cognitive and athletic performance by improving muscle strength and endurance while decreasing reaction time and fatigue; some examples of ergogenic stimulants are caffeine, ephedrine, amphetamine, and methamphetamine.
- Nootropics, or "cognition enhancers", benefit overall cognition by improving memory (e.g., increasing working memory capacity or updating) or other aspects of cognitive control (e.g., inhibitory control, attentional control, attention span, etc.).
- Adaptogens result in stabilization of physiological processes and promotion of homeostasis, an example being by decreased cellular sensitivity to stress.

- Painkillers allow performance beyond the usual pain threshold. Some painkillers raise blood pressure, increasing oxygen supply to muscle cells. Painkillers used by athletes range from common over-the-counter medicines such as NSAIDs (such as ibuprofen) to powerful prescription narcotics.
- Sedatives and Anxiolytics are sometimes used in sports like archery which require steady hands and accurate aim, and also to overcome excessive nervousness or discomfort. Diazepam and propranolol are common examples; ethanol and cannabis are also used occasionally.

ILL EFFECTS OF DRUG ABUSE

Effect of Drug Abuse on the Body

A person who abuses drugs may not realize they have a problem until pronounced effects of drug abuse are seen, often physically. While drug abuse effects on the body vary depending on the drug used, all drug abuse negatively impacts one's health. Common effects of drug abuse on the body include sleep changes and decreased memory and cognitive abilities.

Other common physical problems include:

- Abnormal vital signs like respiration, heart rate and blood pressure.
- Chest or lung pain.
- Nausea, vomiting, diarrhea, stomach pain.
- Skin can be cool and sweating or hot and dry.
- Diseases such as hepatitis B or C, or HIV from needle-sharing.
- Impotence.
- More frequent illnesses.
- Frequent hangovers, blackouts

Side effects of Drugs	
Men	Women
• Acne	• Hair loss
• Impaired liver function	• Male pattern baldness
• Impotency	• Hypertrophy of the clitoris
• Breast formation (Gynecomastia)	• Increased sex drive
• Increase in estrogen	• Irregularities of the menstrual cycle
• Erectile dysfunction	• Development of masculine facial traits
• Increased sex drive	• Increased coarseness of the skin
• Male pattern baldness	• Premature closure of the epiphysis

Psychological effects of drug abuse

- Aggressiveness or irritability.
- Selfishness.
- Hopelessness.
- Lack of pleasure from previously enjoyed activities.
- Pressuring others into doing drugs.

Blood doping

Blood doping is the practice of boosting the number of red blood cells in the bloodstream in order to enhance athletic performance. Because such blood cells carry oxygen from the lungs to the muscles, a higher concentration in the blood can improve an athlete's aerobic capacity (VO₂ max) and endurance. Many methods of blood doping are illegal, particularly in professional sports.

Blood doping is defined by WADA (World Anti-Doping Agency) as the misuse of techniques and/or substances to increase one's red blood cell count. Most commonly this involves the removal of two units (approximately 2 pints!) of the athlete's blood several weeks prior to competition. The blood is then frozen until 1-2 days before the competition, when it is thawed and injected back into the athlete. This is known as autologous blood doping. Homologous doping is the injection of fresh blood, removed from a second person, straight into the athlete.

A second method of blood doping involves the use of artificial oxygen carriers. Hemoglobin Oxygen Carriers (HBOC) and Perfluorocarbons (PFC) are chemicals or purified proteins which have the ability to carry oxygen. They have been developed for therapeutic use, however are now being misused as performance enhancers.

Side-Effects of Blood Doping

The following are side-effects which can occur in any form of blood doping:

- Increased blood viscosity (thickness).
- Myocardial infarction (heart attack).
- Pulmonary embolism (a blockage, which can be fat, air or a blood clot, of the pulmonary artery).
- Cerebral embolism (a blockage, formed elsewhere in the body, which becomes lodged in an artery within or leading to the brain).
- Cerebrovascular accident (stroke).

Assessment Activities

- Chart preparation of illegal drugs and its ill effects.
- Group discussion and presentation.

T E Questions

1. A long distance athlete was admitted in hospital due to mismatching of blood. He told the doctor that he had done something which is illegal to sports. Based on your curriculum, what may be his illegal act? What are the other ill effects of the above process?
2. Which ergogenic aid is used for muscle development?
3. As a physical education teacher tell your students regarding the ill effects of using drugs.
4. Prepare a chart of commonly used drugs by the sports persons.

Unit - 6

FIRST AID AND SPORTS INJURY MANAGEMENT

Introduction

Physical education and sports activities demand sufficient knowledge of first aid since participation in sports involves variety of movements which sometimes leads to variety of injuries. Therefore, whosoever enters in the play field, gymnasium, swimming pool, different kinds of terrain and so on, must have the knowledge of fundamental principles of first aid.

Learning Outcomes

On completion of this, the learner will be able to

1. Differentiate various skin injuries and able be to give first aid for each one.
2. Differentiate various soft tissue injuries and be able to give first aid for each one.
3. Recognize fracture and dislocation.
4. Dramatize first aid for fracture and dislocation.

First aid

First aid is the assistance given to any person suffering a sudden illness or injury, with care provided to preserve life, prevent the condition from worsening, and/or promote recovery. It includes initial intervention in a serious condition prior to professional medical help being available, such as performing CPR while awaiting an ambulance, as well as the complete treatment of minor conditions, such as applying a plaster to a cut.

Sports injuries

"Sports injuries" are injuries that happen when playing sports or exercising. Some are from accidents. Others can result from poor training practices or improper gear. Some people get injured when they are not in proper condition. Not warming up or stretching enough before one play or exercise can also lead to injuries.

I. SKIN INJURIES AND ITS MANAGEMENT

1. Abrasion

In dermatology, an abrasion is a wound caused by superficial damage to the skin, no deeper than the epidermis. It is less severe than a laceration. A more traumatic abrasion that removes all layers of skin is called an avulsion. Abrasion injuries most commonly occur when exposed skin comes into moving contact with a rough surface, causing a grinding or rubbing away of the upper layers of the epidermis.

The abrasion should be cleaned and any debris removed. A topical antibiotic should be applied to prevent infection and to keep the wound moist. Dressing the wound is optional but helps to keep the wound from drying out which interferes with healing.

2. Laceration

A laceration is a wound that occurs when skin, tissue, and/or muscle is torn or cut open. Lacerations may be deep or shallow, long or short, and wide or narrow.

Laceration repair is the act of cleaning, preparing, and closing the wound. The treatment depends on the type, cause, and depth of the wound.

3. Incision

An incision is a surgical "cut" through which an operation is performed. An incision may be closed with sutures (stitches) on the outside of the body. Other incisions are closed with surgical staples, which provide added strength to the incision.

An incision should be kept clean and dry always times to help promote healing. If the doctor permits a tub bath or shower, can gently wash over the incision.

4. Puncture Wounds

Puncture wounds are caused when sharp and pointed objects such as nails, knife tips, penetrate the skin. Animal bites are another cause of puncture wounds. . If the puncture wound is in the head, neck, chest, or abdomen, and penetrates deeply enough to affect an internal organ, contact the doctor.

Several times a day for four or five days, soak the wound in warm water. Use a bathtub or basin if the wound is on the foot or leg. Soaking helps clean the wound from the inside out.

5. Blisters

A blister is a small pocket of fluid within the upper layers of the skin, typically caused by forceful rubbing (friction), burning, freezing, chemical exposure or infection. Fluid collects between the epidermis. This fluid cushions the tissue underneath, protecting it from further damage and allowing it to heal.

Leave uncovered or cover loosely with a bandage. Try not to put pressure on the affected area.

II. SOFT TISSUE INJURIES AND ITS MANAGEMENT

1. Contusion

Contusion is bruising of skin and underlying tissues of the body parts due to a direct blow, contusion causes bleeding from ruptured small capillaries that allow blood to infiltrate muscles, tendons or other soft tissue.

2. Strain

A strain is an injury to a muscle in which the muscle tear as a result of overstretching.

A strain is also colloquially known as a pulled muscle or torn muscle. Typical symptoms of a strain include localized stiffness, discoloration and bruising around the strained muscle.

3. Sprain

A sprain, also known as a torn ligament, is the damage caused to one or more ligaments in a joint, often caused by trauma or the joint being taken beyond its functional range of motion. The severity of sprain ranges from a minor to a major rupture of one or more ligaments requiring surgical fixation and a period of immobilization. Sprains can occur in any joint but are most common in the ankle and wrist.

The first-line treatment for contusion, sprain and strain in the acute phase include five steps commonly known as **P.R.I.C.E.**

- **Protection :** The purpose of protection is to avoid further injury to the area by protecting the injured structures. The type protection used include bandage, aluminum splint, sling, protective tape or brace.
- **Rest :** Rest and protect the injured or sore area. Stop, change, or take a break from any activity that may be causing pain or soreness.
- **Ice :** Cold will reduce pain and swelling. Apply an ice or cold pack right away to prevent or minimize swelling. Apply the ice or cold pack for 10 to 20 minutes, 3 or more times a day. After 48 to 72 hours, if swelling is gone, apply heat to the area that hurts. Do not apply ice or heat directly to the skin. Place a towel over the cold or heat pack before applying it to the skin.
- **Compression :** Compression or wrapping the injured or sore area with an elastic bandage will help decrease swelling. Should not wrap it too tightly, because this can cause more swelling below the affected area. Loosen the bandage if it gets too tight. Signs that the bandage is too tight include numbness, tingling, increased pain, coolness, or swelling in the area below the bandage.
- **Elevation :** Elevate the injured or sore area on pillows while applying ice and whenever the victim is sitting or lying down. Try to keep the area at or above the level of the heart to help minimize swelling.

4. Overuse injury

An overuse injury is damage to a bone, muscle, ligament, or tendon due to repetitive stress without allowing time for the body to heal. Shin splints are an example of an overuse injury. An overuse injury is any type of muscle or joint injury, such as tendinitis or a stress fracture, that's caused by repetitive trauma. An overuse injury typically stems from: Training errors. Training errors can occur when someone enthusiastically take on too much physical activity too quickly.

Factors and Causes of Overuse Injuries

- Training errors.
- Improper technique.

- Beginning a sport or doing too much too soon.
- Not allowing the body adequate time to recover.
- Doing too much of one activity over time (not cross training).

III. BONE INJURIES AND ITS MANAGEMENT

1. Fracture

A bone fracture is a medical condition in which there is damage in the continuity of the bone. A bone fracture can be the result of high force impact or stress, or a minimal trauma injury as a result of certain medical conditions such as osteoporosis, or osteogenesis, where the fracture is then properly termed a pathologic fracture.

Signs and symptoms of fracture

- Pain at near the place of fracture.
- Tenderness or discomfort on gentle pressure on the affected area.
- Swelling around the place of fracture.
- Loss of strength; the injured part cannot be moved normally.
- Irregularity of the bone. If the fracture is near the skin the irregularity of the bone may be felt.
- Crepitus (bony grating) may be heard or felt.
- Unnatural movement at the place of fracture.

Types of bone fracture

There are many types of fractures, but the main categories are complete, incomplete, compound and simple.

■ **Complete and incomplete** fractures refer to the way the bone breaks. In a complete fracture, the bone snaps into two or more parts; in an incomplete fracture, the bone cracks but does not break all the way through.

■ **Compound fracture**- also called an open fracture, the bone breaks through the skin. It may then recede back into the wound.

Simple fractures include:

- Greenstick fracture: an incomplete fracture in which the bone is bent. This type of fracture happens most often to children.
- Transverse fracture: a fracture at a right angle to the bone's axis.
- Oblique fracture: a fracture in which the break is at an angle to the bone's axis.
- Comminuted fracture: a fracture in which the bone fragments into several pieces.
- An impacted fracture is one whose ends are driven into each other. This commonly occurs with arm fractures in children and is sometimes known as a buckle fracture.

Treatment

- Stop any bleeding.
- Immobilize the injured area using bandage or splint.
- Apply ice packs to limit swelling and help relieve pain.
- Cover the open fracture with sterile dressing to prevent infection and also the bleeding.

2. Dislocation

A joint dislocation, or luxation, occurs when there is an abnormal separation in the joint, where two or more bones meet. A partial dislocation is referred to as a subluxation. Dislocations are often caused by sudden trauma on the joint like an impact or fall.

The following symptoms are common with any type of dislocation.

- Intense Pain.
- Joint instability.
- Deformity of the joint area.
- Reduced muscle strength.
- Bruising or redness of joint area.
- Difficulty moving joint.
- Stiffness.

Treatment

- Should not delay medical care.
- Should not move the joint.
- Put ice on the injured joint.
- Immobilize the injured area using bandage or splint.

Assessment Activities

- Poster preparation of various sports injuries.
- Role play on first aid treatment.

T E Questions

1. One of your friends got an ankle sprain while playing football along with you. Recommend first aid for that.
2. Imagine that your friend is injured in a play field. Describe different reasons to suspect the injury a fracture. Describe different sports injuries you may come across.
3. Tennis elbow is an example for which type of injury? (chronic, over use, sudden).
4. -----is used to immobilize a fractured bone (splint, band aid, gauze pad).

PRACTICAL

UNIT 3.7 : RESISTANCE TRAINING

Introduction

Resistance training is any exercise that causes the muscles to contract against an external resistance with the expectation of increase in strength, tone, mass, and/or endurance. The external resistance can be dumbbells, our own body weight, bricks, bottles of water, or any other object that causes the muscles to contract.

Learning Outcomes

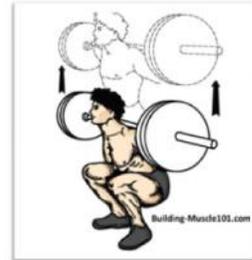
On completion of this, the learner will be able to

1. Demonstrate various resistance training methods using own body weight, barbells, dumbbells, machines and medicine balls.
2. Design training programs to improve various strength.

1. Barbell Squat

- Primary Muscle Group(s): Back (Lower), Front Thighs, Gluteus Maximus (Butt)
- Secondary Muscle Group(s): Hamstrings, Calves

1. Take a barbell from a squat rack and hold it at the back of the neck with the hands on the bar. Keep the back and head straight. The feet should be spaced at shoulder width.
2. Grasp the bar with the hands spaced slightly wider than shoulder width apart.
3. The bar should be resting comfortably across the trapezius muscle.
4. In a controlled fashion, slowly squat down until the knees are parallel to the floor. Should remember not to bounce at the bottom of the movement.
5. Slowly straighten the legs and return to the start position. The subject should keep the head level through the time of exercise.



2. Leg Curl

- Primary Muscle Group(s): Hamstrings
- Secondary Muscle Group(s): - Gluteus maximus (Butt) - Calves



1. Lying face down on a leg curl machine, hook the heels under the leg curl pad

and grab hold of the handles.

2. Curl the legs upwards until the subject cannot go any further. Hold for a second and slowly extend the legs back out. Should not bounce the weight at the bottom.

3. Bench Press

- Primary Muscle Group(s): Chest (Pectorals)
- Secondary Muscle Group(s): Shoulders (Front) and Triceps

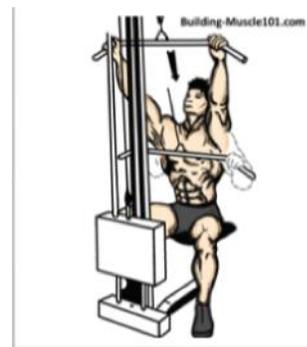


1. The lifter should lie back on the bench with the feet firmly planted on the floor and back pressed firmly against the padding.
2. He takes a tight grip of the barbell (overhand) with the thumbs roughly 3 feet (90cm) apart. The lifter should make sure that his grip is balanced between both sides of his body. Once the grip is set, presses the shoulders down and back into the bench. This will push up the pectoral girdle and allow for a much better stimulation.
3. Lifts the bar from the rack.
4. Takes the barbell from the rack and lock the elbows at the top position. Lowers the barbell to the nipple area of the chest, slowly and under control, keeping the elbows away and outward from the trunk of the body.
5. As the weight lowers, one should make sure not to bounce the weight - very important - should not bounce the weight from the chest. Push the weight back up in a controlled fashion.

4. Lat Machine Pull Down

- Primary Muscle Group(s): Back
- Secondary Muscle Group(s): Shoulders (Front & Rear) and Biceps

1. Stand in front of a lat pull down apparatus and grasp the bar using an overhand grip at least one foot wider than the shoulders on each side.
2. Sit down with the feet firmly planted on the floor with the body straight and thighs secured underneath the thigh pads.
3. Slightly arch the torso. Keep the body straight and rigid throughout the whole movement.

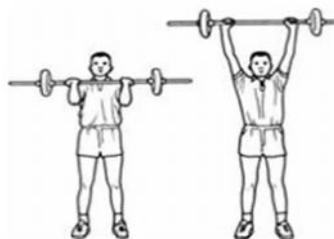


4. Hold the bar overhead with the arms at full extension.
5. In a controlled fashion, pull the bar down in front of the head until the subject gently touch the upper chest area. Pause.
6. Slowly bring the bar back to the starting position until the arms are straight.

5. Front Barbell Press

- Primary Muscle Group(s): Shoulders-Deltoid
- Secondary Muscle Group(s): Trapezius and Triceps

1. Grasp a barbell with the hands spaced a little wider than shoulder width. Keep the back and head straight with the feet firmly planted on the floor.
2. Take the weight off the rack and press the bar directly over the head in a vertical line.
3. Slowly lower the bar to just below chin level.
4. Push the bar back up without bounding the weight. Should remember to keep the back straight and flat (no arching) Repeat the movement.



6. Dumbbell Shrug

- Primary Muscle Group(s): Trapezius (Upper Back)
- Secondary Muscle Group(s): Forearms

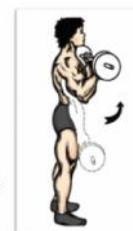
1. Stand straight with the feet planted firmly with a shoulder width stance. The knees should be slightly bent.
2. Grasp two dumbbells with the hands spaced shoulder length apart. Keep the weight held at straight arms length with a slight bend in the arms.
3. Raise the dumbbells upwards toward the ears, pause, and lower the weight. Repeat. This exercise can also be performed with a barbell.



7. Standing Barbell Curl

- Primary Muscle Group(s): Biceps
- Secondary Muscle Group(s): Shoulders (Front), Forearms

1. Standing upright, grab a barbell using an underhanded grip.

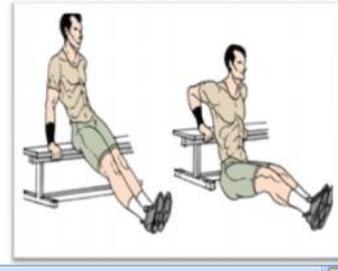


2. Hold the bar in the arms down position. Hold the bar slightly wider than shoulder width.
3. Keep the feet at shoulder width with the back straight and head level. Keep the arms close to the body. The bar should be resting across the thighs.
4. Curl the weight up in a controlled fashion until the bar is under the chin. Pause for a second and slowly lower the bar until the arms are fully extended in the arms down position. Repeat the movement.

8. Triceps Bench Dip

- Primary Muscle Group(s): Triceps
- Secondary Muscle Group(s): Shoulders, Chest

1. Place the hands on the edge of one bench and place the heels on the ground. The hands and feet should be shoulder width apart.
2. Extend the arms completely.
3. Slowly bend the arms until the body is lowered to the maximum. Slowly push back up to the start position. Repeat the movement.



9. The Standing Calf Raise

- Primary Muscle Group(s): Calves
- Secondary Muscle Group(s):

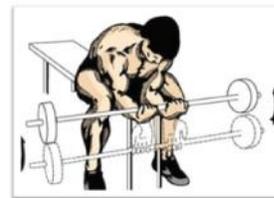
1. Standing upright, place the toes on the apparatus platform. Ensure that they are on the balls of the feet at the edge of the apparatus platform.
2. Slowly drop the heels as far as they can go.
3. Place the hands on the shoulder pads.
4. Rise up as high as possible on the balls of the toes without excessive knee bending.
5. Slowly lower the heels as far as possible. Should not bounce at the bottom of the movement. Repeat.



10. Wrist Curl

- Primary Muscle Group(s): Forearms
- Secondary Muscle Group(s): Biceps

1. While seated on a bench, take a barbell and rest it with arms on the knees or on the bench. Slightly bend at the waist.



- Moving only the wrist, curl the weight upward until the forearm is fully contracted. Allow the barbell to lower under control.

11. Hyper extensions

- Primary Muscle Group(s): Back, Gluteus Maximus (Butt), Hamstrings
- Secondary Muscle Group(s): Calves

- Place the legs and hips downwards on the apparatus with the body turned around facing the floor.
- Upper body should be free to rise up and down. Either place the hands behind the head or in front of the body in a crossed position.
- Lower the trunk of the body towards the floor.
- Rise until the body is at least in a straight line. Lower and repeat.



12. Abdominal Crunch

- Primary Muscle Group(s): Abdominals
- Secondary Muscle Group(s):

- Lie on the floor with the arms across the chest or the hands clasped behind the head. Keep the feet on the floor or raise them.
- Tighten the abs and slowly curl the shoulders up off the floor. Curl the shoulders up toward the knees until the shoulder blades come one to two inches off the floor.
- Hold this position for a second before slowly returning to the starting position. Repeat.



FEW OTHER EXERCISES

1. DUMBBELL BENCH PRESS

- Primary Muscle Group(s): Chest (Pectorals)
- Secondary Muscle Group(s): Shoulders (Front) and Triceps

2. DUMBBELL FLY

- Primary Muscle Group(s): Chest (Pectorals)
- Secondary Muscle Group(s): Shoulders (Front), Back (Lats) and Triceps

3. BENT OVER ROWS

- Primary Muscle Group(s): Back
- Secondary Muscle Group(s): Shoulders (Rear) and Biceps

4. GOOD MORNINGS

- Primary Muscle Group(s): Back, Gluteus Maximus (Butt), Hamstrings
- Secondary Muscle Group(s): Front Thighs, Calves

5. CHIN UP

- Primary Muscle Group(s): Back
- Secondary Muscle Group(s): - Shoulders (Front & Rear)- Biceps

6. DEAD LIFT

- Primary Muscle Group(s): Back, Front Thighs, Gluteus Maximus (Butt)
- Secondary Muscle Group(s): Abs, Biceps, Hamstrings and Calves

7. SEATED CABLE ROW

- Primary Muscle Group(s): Back
- Secondary Muscle Group(s): Shoulders (Front & Rear) and Biceps

8. LEG EXTENSIONS

- Primary Muscle Group(s): Front Thighs
- Secondary Muscle Group(s):

9. DUMBBELL LUNGES

- Primary Muscle Group(s): Front Thighs
- Secondary Muscle Group(s): Hamstrings, Gluteus Maximus (Butt), Calves

10. LEG PRESS

- Primary Muscle Group(s): Front Thighs
- Secondary Muscle Group(s): Hamstrings, Gluteus Maximus (Butt)

11. STANDING ALTERNATE DUMBBELL CURL

- Primary Muscle Group(s): Biceps
- Secondary Muscle Group(s): Shoulders (Front), Forearms

12. SEATED TRICEPS DUMBBELL EXTENSION

- Primary Muscle Group(s): Triceps
- Secondary Muscle Group(s): Shoulders

MEDICINE BALL EXERCISES

1. SIDE THROWS

- Be at 90 degrees to wall with ball behind one hip and more weight on that leg.
- Deliver ball at hip height, with more weight on front leg.
- Catch ball and repeat.



2. MODIFIED HAMMER THROW



Begin with ball near hip opposite of throw/delivery side.

-Start transferring weight from backside to delivery side by turning back foot.

-Finish with throw delivering ball at shoulder height with weight balanced over delivery side.

-Throw can also begin over shoulder.

3. SLAMS

- Start with ball overhead.
- Throw pulling ball down with your mid section.
- Keep ball stretched as long as possible.
- This exercise can also be done with one arm.



4. KNEE THROW TO PUSH UP



- Start with ball at chest level.

- Kneeling down on both knees, throw the ball forward and follow it.

- When completing extension catch yourself in a push up position.

- This can also be done from an overhead Position

5. PUTS

- Start with ball behind one hip with weight more on that leg.
- Throw the ball turning the side with ball towards the direction of the throw.
- Finish in a balanced position.



6. WALL THROWS

- Swing ball to an overhead position, stretching the upper extremities.
- Throw by pulling core down.
- Aim about 1 to 2 feet above the bottom of the wall.
- Stand about 6 to 8 feet from the wall.



7. SQUAT THROW



- Start with ball at chest.
- Quickly squat and jump delivering the ball as high as possible directly overhead.
- Let the ball bounce once, reposition and repeat. the ball bounce once then repeat.

8. OVER THE BACK TOSS

- Start with ball overhead and bring it down to knees.
- Begin throw as soon as ball gets to knee level.
- Throw by extending ankle, knee, hip and delivering ball overhead backwards.
- This is a great total body power test.



EXERCISE SELECTION AND ORDERING

The following points have to be remember while selecting the resistance training exercises.

- All the muscles should receive exercise.
- Power exercises such as snatch, power clean, and push jerk should be performed first in a training session, followed by other non power core exercises, and then assistance exercises. The literature also refers to this arrangement as multi joint exercises and then single joint exercises or large muscle areas and then small muscle areas.
- When exercising opposing muscle groups, training should be done one after the other with equal intensity. E.g. exercises for hamstring muscles shall be given after that for the quadriceps muscles.

UNIT 3.8 AEROBICS

Introduction

Aerobics is a form of physical exercise that combines rhythmic aerobic exercise with stretching and strength training routines with the goal of improving all elements of fitness (flexibility, muscular strength, and cardio-vascular fitness). It is usually performed to music and may be practiced in a group setting led by an instructor (fitness professional), although it can be done solo and without musical accompaniment. With the goal of preventing illness and promoting physical fitness, practitioners perform various routines comprising a number of different dance-like exercises.

Learning Outcomes

On completion of this, the learner will be able to

1. Design and demonstrate an aerobic training program.

Low- and High-Impact Aerobics

Low-impact aerobic dance is typically about one hour's worth of movements where participants keep one foot on the floor at all times. This variety of aerobic dance is easier on the knees. This form of aerobics is more appropriate for pregnant and overweight people than high-impact aerobics. High-impact aerobics includes movements such as hopping and jumping that mobilize both feet off the ground at the same time, which is more strenuous than low-impact routines.

Variations

Step aerobics participants use a small platform during their workout. Stepping on and off the platform -- which can sometimes be raised or lowered depending on workout intensity level -- adds variety and a greater cardiovascular challenge. Water aerobics are done in a swimming pool and further reduce strain on the lower back and joints.

- One should perform warm-up exercises 10-15 minutes before doing dance aerobics. This may include stretching or flexibility exercises, followed by jumping jacks or jogging.
- Should always wear perfect fitting clothes, while doing dance aerobics. Loose-fitting clothes are not good for the exercise, because they restrict the free movement of arms and feet. The preferred attire for dance aerobics is shorts with a jersey.
- Can bring in variations to the dance steps and make the exercise even more personalized.
- Cool down exercises must be done after performing the exercise and most do stretching exercises for about 10 minutes after the workout.

Unit 3.9 SWIMMING

Introduction

Swimming is an individual or team sport and activity. Competitive swimming is one of the most popular Olympic sports, with events in Freestyle, Backstroke, Breaststroke, and Butterfly. In addition to these individual events, Olympic swimmers also participate in relays.

Learning Outcomes

On completion of this, the learner will be able to

1. Execute various skills needed for swimming.

Unit 3.10 TRACK AND FIELD

Introduction

The sport of athletics is an exclusive collection of sporting events that involve Competitive Running, Jumping, Throwing and Walking. The most common type of athletic competitions are Track and Field, Road running, Cross country and Race walking.

Learning Outcomes

On completion of this, the learner will be able to

1. Demonstrate the skills of Triple jump, Pole vault, Discus throw, Hammer throw, and Javelin throw.
2. Apply field markings of Javelin throw, Shot put, Discus throw, and Hammer throw.
3. Act as official in field events.

Unit 3.11 BADMINTON

Introduction

Badminton is a racquet sport played using racquets to hit a shuttlecock across a net. Although it may be played with larger teams, the most common forms of the game are "singles" (with one player per side) and "doubles" (with two players per side). Badminton is often played as a casual outdoor activity in a yard or on a beach; formal games are played on a rectangular indoor court. Points are scored by striking the shuttlecock with the racquet and landing it within the opposing side's half of the court.

Learning Outcomes

On completion of this, the learner will be able to

1. Implement badminton court marking.
2. Execute various skills of badminton.
3. Act as official in a badminton match

Unit 3.12 PRACTICE TEACHING

Introduction

The main scope of the Physical Education course is becoming a teacher in School. Keeping this in mind a large space is provided for practice teaching in a formal way. Through this students will be able to acquire teaching skills, knowledge regarding different parts of lesson plan, time allotment to various stages of lesson plan. While doing practice teaching they acquire the required skills for handling different kinds of students effectively. This boosts up the confidence of the students and takes them to a higher level of maturity accomplishment.

Learning Outcomes

On completion of this, the learner will be able to

1. Perform teaching classes in general and specific lessons.

Unit 3.13 SPECIALIZATION

Introduction

Students are given opportunity to specialize in one game which enable them to attain proficiency and achievement in any one game of their choice. During specialization student get opportunity to practice a particular game for two hours daily which helps to expand the practical and theoretical knowledge. During specialization one learn all the rules and regulations thoroughly which in turn give an additional opportunity to build her career as a qualified official of a particular game.

Learning Outcomes

On completion of this, the learner will be able to

1. Perform well in their specialized game at various competitions.
2. Act as an official in their specialized game.
3. Teach and coach their specialized game.

Unit 3.14 INTRAMURALS

Intra mural is a competition conducted within an institution. Here an intramural committee is formed to organize and conduct various competitions. The VHSE first year and second Year students will be divided into three houses.

Learning Outcomes

On completion of this, the learner will be able to

1. Organize intramural competitions.

EXTENDED ACTIVITES

- Preparing Weight training workouts.
- Preparing Aerobics workouts.
- Assisting medical team.
- Preparing personal Fitness card.
- Attending Personality and leadership development camps.
- Visiting various doping agencies.

- Practice teaching in various schools.
- Coaching various sports and games.
- Organizing various sports and games.

LIST OF PRACTICALS

- Resistance training.
- Aerobics.
- Swimming.
- Track and field.
- Badminton.
- Practice teaching.
- Intramurals.
- Specialization.

Module 4

Over View

HEALTH AND YOGIC SCIENCE

Yoga being the Indian origin tradition and wisdom, which is gaining popularity and accepted by people all over the world than ever before, students generally and physical education students specifically should get the right knowledge and wisdom regarding traditional and classical yoga. In view of the current needs, in this particular module students are provided with the knowledge on history and evolution of yoga, different traditions of yoga and different classical yogic texts.

Yoga is a way of living, In yogic science there are different method to keep the body fit and live long without any diseases. Through Asana the body can be kept intact and pranayama helps to control the breath and pranic energy. Prathyahara, darana and dhyana helps to control the mind and improve concentration and attain mental peace. This module covers all these components of yoga in brief. Due to modern way of living and industrialization human being are prone to life style diseases like diabetes, blood pressure, obesity etc. The syllabus is carefully prepared to cover different yogic practice which helps to lead a healthy life. Without the knowledge of health and health education Physical education is incomplete. So the students are taught about these concepts. Posture and its corrective measures included in this module, nutrition in general with a special reference to sports nutrition is included to motivate the students and to chart a nutritional diet to sports persons in different sporting events. In the modern competitive world mental capacity of a sports person play a vital role so sports psychology with a special focus on personality and motivation has been included. Society and sports cannot be separated, the role of society in development of a child is crucial and a student teacher of physical education should know the different types of recreational activity for different age groups which is essential when dealing with different community.

Unit - 1

FUNDAMENTALS OF YOGA

Introduction

In this unit students are provided with the knowledge of history and evolution of yoga in ancient India. Without knowing the classical text books in yoga like pathanjali yoga sutra, Hatha yoga pradipika. Gharanda samhitha and Goreksha samhitha the knowledge in yoga is incomplete, so an introduction to all these texts are given here.

The difference between Raja Yoga and Hatha Yoga has been briefed and the Hatha yogic technique like asana, pranayama, mudra, satkriyas and bandhas is covered here in detail. The precautions during asana practice and the principles of practicing yogic techniques is given here in detail. Stages of Astanga yoga and different yogic therapy for reduction and prevention of lifestyle diseases also discussed in this unit.

Learning outcomes

On completion of this, the learner will be able to

- 1 Illustrate evolution and history of Yoga and Compare different Yogic texts.
- 2 Choose different yogic practices for different diseases.
- 3 Differentiate eight limbs of Astanga Yoga.
- 4 Perform different yogic practices.
- 5 Perform different asanas perfectly.
- 6 Analyze different aspect of breathing and pranayama.
- 7 Differentiate different types of Meditation.
- 8 Differentiate exercise and yoga.

History

Yoga is an Indian discipline of theory and practice which leads to the realization of the ultimate truth. Yoga has its origin far back in pre historic times, as recent archaeological evidence has shown. It was quite vogue in the ancient Indus-Saraswathy Culture formerly designated as Indus Valley Civilization going back to 3000 B.C. The discipline of Yoga consists of the modes and methods which were discovered by Indian Rishis and Munis to overcome the sufferings and bring liberation from the sufferings of life.

There are many branches of yoga: raja yoga, hatha yoga, jnana yoga, karma yoga, bakthi yoga, laya yoga to name but a few, and many texts explain them in detail.

Each individual needs to find those yoga most suited to his or her particular personality and need.

Different schools of yoga advocate different sets of practice, depending upon the goal. Patanjali advocated Astangayoga which comprises of eight steps they are yama, niyama, asana, pranayama, prathyahara, dharana, dhyana and samathi. Another authentic famous manual of Hathayoga is Svatmarama Yogin's Hathayoga-Pradipika which is divided into four Upadesas (lessons). The first lesson discusses mainly Yogic postures (Asanas), the second Pranayama, the third Mudra and the fourth Samadi, the final goal of yoga sadhana.

Meaning and Definition

The word yoga means unity or oneness and derived from the Sanskrit word 'yuj' which means 'to join'. Yoga is the science of right living and it works on all aspect of person: the physical, mental, emotional, psychic and spiritual. On a practical level, yoga is a means of balancing and harmonizing the body mind and emotions. This is done through asana, pranayama, mudra, shatkarma and meditation. Yoga aims at bringing the different bodily functions into perfect co-ordination so that they work for the good of the whole body.

Yoga has been defined differently in various textbooks. Patanjali Maharshi defines Yoga as 'Yogascittavrittinirodahah' which means Yoga is the control of the thought waves in the mind. According to Gita 'Samatvam Yoga Ucyate' means harmony or balance is Yoga

Astanga Yoga or Rajayoga

Astanga yoga or the Yogasutras of Maharsi Pathanjali is perhaps the first systematic work on yoga in 16th century C.E. The Yogasutras is a compilation of all the scattered references which have been put by Maharshi Pathanjali in the form of sutras (aphorisms), hence popularly known as Yogasutra. In Astanga yoga there are eight fundamental stages which are yama, niyama, asana, pranayama, prathyahara, dharana, dhyana and samathi

Yama and Niyama : The five yamas are satya (truthfulness), ahimsa (non-violence), asteya (honesty), bramacharya (sexual control), aparigraha (non-possessiveness). Niyamas are also five in number they are saucha (cleanliness), santosha (contentment), tapa (austerity), swadhyaya (self study), and iswarapranidhana (surrender to cosmic will). Yamas are designed to harmonize ones social interactions and the niyamas are intended to harmonize ones inner feelings.

ASANA AND PRANAYAMA : (Details are given in the later part of this chapter)

Pratyahara : means gather inwards. The practice is concerned with checking and curbing outer tendencies of the mind so that awareness can be directed inwards. The chapattis of smell, touch, taste, sight, and hearing are withdrawn from their object and the senses begin to follow the mind inward and not outward.

Dharana : means concentration, trying to concentrate on a particular thing, it can be a physical object or a mental image. Concentrating in the breathing process with awareness is the most common dharana practice

Dhyana : is meditation; it is the higher stage of concentration. Normally meditation is done by sitting in any posture by keeping the spine erect and eyes closed, and fixing the mind either on breathing or a fixed mental image which helps the mind to focus at one point. There are hundred types of meditations. According to Yogic texts Dhyana is of three types sthula dhyana, jyothi dhyana and sukshma dhyana

Samadhi: It is the highest stage, the goal and aim of yoga. This is the ultimate bliss and the individual consciousness and universal consciousness will join together in this state.

Hatha Yoga

Hatha yoga or forceful yoga is a post-classical or medieval development of Yoga involving belief in practices relating to mystic entities like Chakras, Nadis, Kundalini etc and aiming at Siddhis or paranormal powers. Hathayoga involves shift of focus from spirit to body, to mastery over the physical nature.

Satkriyas (Purificatory process)

Satkriyas or Satkarmas are one and same. The word is a combination of two words 'Sat' means six and 'kriya' or 'karma' means action or practice. According to Hathayogic texts Satkriya cleanse the body internally by removing accumulated toxins, impurities and poisonous substances from the body. Six purificatory process are as follows.

Dhauti: (Internal Cleansing) A strip of wet cloth about 6 meters length is slowly swallowed and then taken out, as instructed by the Guru. Dhauti cleanses the entire digestive tract. It removes excess of bile. Mucus, toxins and restores natural balance of the body.

Basti: (Yogic enema) Basti means the lower abdomen. It involves drawing water or air into the large intestine via the anus and then expelling it. This aims to cleanse the lower part of the colon upto anal sphincter, this technique completely washes the bowels, remove the old stool, thread worms, cure digestive disorders, remove

constipation and strengthen the solar plexus.

Neti : (Nasal Cleansing Process) Neti is concerned with cleaning of nasal passage. Neti is of two types, Jalneti (with water) and sutraneti (with thread). Jalneti practice involve pouring of water into one nostril and it automatically comes out through other nostril. In Sutraneti a fine thread is taken inside one nostril and then pulled out of the mouth through the throat. Neti maintains the secretory and drainage mechanism of the entire ear, nose and throat area healthy and helps to ward off cold and cough. It also releases anxiety, migrane, apoplepsy and hysteria.

Trataka : (Concentrated Gazing) This kriya performed for cleansing and strengthening the eyes. In this eyes are usually focused on a selected object which can be the flame of a lamp or a burning candle. The gazing is done without blinking till the eyes start watering. Trataka is beneficial for eye muscles, concentration and memory, its most importance is on the brain, it unlocks the inherent energy of mind and channelizes to the area of consciousness.

Nauli : (Roating the Abmoninal Recti Muscle) Nouli is a practice of contracting and isolating the rectus abdominis muscle. Nouli tones the abdominal muscles, nerves, reproductive, excretory and urinary organs. It is useful for the persons suffering from indigestion constipation and acidity.

Kapalabati: (Frontal Brain Cleansing) In Kapalabati breathing is done like pumping action, Inhalation is a passive and spontaneous and exhalation is with force distroys the disorders of phlegm, bile and water born diseases, it also purifies the head and expels more carbondioxide and other waste gases from the cells and lungs.

Mudra

The Sanskrit word mudra is translated as 'gesture or 'attitude'. Mudras are a combination of subtle physical movements or asana, pranayama, bandha and visualization technique, or may be simple hand position. Yoga mudras can be classified into three groups.

Hasta (hand mudras) They redirect the prana emitted by the hands back into the body. Mudras which join the thumb and index finger engage the motor cortex at a very substle level. Some of hastamudras are jnana mudra, chin mudra, bhairava mudra and hridaya mudra.

Mana (head mudras) This use the eyes, ears, nose, tounge, and lips to assume different mudras. Some head mudras are sambhavi mudra, nasikagra drishti, kaki mudra, bhrumadya drishti and shanmukhi mudra.

Kaya (postural mudras) these practices utilize physical postures combined with breathing and concentration. Techniques included in this category are vipareeta karani mudra, yoga mudra, tadagi mudra and maha mudra.

Asanas (Postures)

Asana has been derived from a Sanskrit root 'as' which means to sit. Asana is a state

of being in which one can remain physically and mentally steady, calm, quite and comfortable. In Patanjali Yoga Sutras there is a concise definition of yogasanas as "Sthiram sukham aasanam" meaning that position which is comfortable and steady. In Raja yoga, asana refers to sitting position, but in hatha yoga it means specific body positions and by developing control through the asana, the mind is also controlled. Therefore, the practice of asana is foremost in hatha yoga.

The total number of asanas are said to be 84 Lac, it has been reduced to 84 most useful asanas. Gheranda samhitha gives 32 asanas, Swatmaraman describes 15 asanas in Hathayoga Pradipika.

Pranayama

The word Pranayama is comprised of two roots 'prana' and 'ayama'. The word 'prana' means vital energy or life force, and the word 'ayama' means extension or expansion. Thus pranayama means 'extension of the dimension of prana. The technique of pranayama provide the method whereby the life force can be activated and regulated in order to go beyond one's normal boundaries or limitations and attain a higher state of energy and awareness.

In the pranayama practices there are four important aspects of breathing which are

- Pooraka or inhalation.
- Rechaka or exhalation.
- Antar kumbhaka or internal breath retention.
- Bahir kumbhaka or external breath retention.

A person should be aware of the breathing process and pattern of breathing. Normally an average person breath 15 times on one minute so in one day average of 21,000 times per day. Most people breathe incorrectly, using only a small part of their lung capacity. There are different types of breathing.

Natural breathing : This is a simple technique which introduces practitioners to their own respiratory system and breathing patterns. It is very relaxing and may be practiced any time. Awareness of breathing pattern itself sufficient to slow down the respiratory rate and established a more relaxed rhythm.

Abdominal breathing : It is practiced by enhancing the action of diaphragm and minimizing the action of ribcage. Movement of the diaphragm signifies that the lower lobes of the lungs are being utilized. Abdominal breathing is the most natural way to breathe which improves lymphatic drainage from basal parts of the lungs, massage the liver, stomach, intestines and other organs.

Thoracic breathing : It utilizes middle lobes of the lungs by expanding and contracting rib cage. It is often associated with physical exercise and exertion, as well as stress and tension. However the tendency in many people to continue this

type of breathing instead of abdominal breathing long after the stressful situation passed, creating bad breathing habits and continued tension.

Benefits of Pranayama

- Reduces stress related disorder.
- Improves automatic nervous functions.
- Reduces all breathing related problems.
- Helps to steady the mind and improves willpower.
- Helps to lower blood pressure.
- Clears blocked nostrils and reduces sinus problems.
- Purifies the frontal portion of brain.
- Improves lungs function and reduces breathing rate.

Asanas and Exercise

The principles and process of performing asanas and exercises are entirely different, there is a misconception that one who practicing yoga should not perform exercise but both asana and exercise will go hand in hand if we chart a fitness program after analyzing the principles and difference of these. Some of the basic differences of asanas and exercise are follows.

Asana	Exercise
The movement to assume and release asana are slow smooth and without jerks.	Exercise are performed in a fast or speedy manner leading to exertion.
The maintenance phase of asana is more important than the movement part of it.	In exercise maintenance phase is rarely absorbed and if at all, it is absorbed for a very short period.
In asana spinal column is moved and always involved and the action of deeper muscles and precise nervous control over them.	All movements are gone through with a jumpy and jerky elements. The movements are quick or rapid and may be repetitive in nature.
The effect of asanas is more on the trunk part.	Movements of extrimities are more prominent in exercise
After the session of asanas, one feels refreshed, relaxed and energetic with a sence of wellbeing.	After exercise one feels tired and needs rest some time he will be completely exhausted.
In asana spinal column is moved in all directions by doing the counter movements of earlier asana. The principle of balance is never missed.	In exercise backward bending is seldom practices.

Yoga therapy

Yoga therapy is a method of adapting different yogic practices to reduce different disease or abnormalities. In yoga therapy different asanas, pranayamas, satkriyas are used according to the need. Diabetes mellitus can be controlled by practice of Pavanamuktasana and Yoga mudra, which helps to massage and activate pancreas and produce more insulin thereby blood sugar is reduced. Those who have high blood pressure can practice meditation and relaxing asanas. Obesity can be reduced through all asanas, suryanamaskar and satkriyas.

Assessment Activities

- Short note on self experience after pranayama and meditation.
- Assignment on muscles involved in different asanas.

T E Questions

1. Write down the history, origin and evolution of yoga in India.
2. What are the eight limbs of ashtanga yoga.
3. Differentiate hatha yoga and raja yoga.

Unit - 2

HEALTH EDUCATION

Introduction

Health can be achieved, maintained and improved by supplying the basic physical, mental, emotional and social needs in proper proportion. In fact health is the key to education, success, good citizenship and happy life. This unit will convey this message to the learner.

Learning outcomes

On completion of this, the learner will be able to

1. Recognize dimensions of health and its importance.
2. Explain the importance of health education.

Meaning

Health means soundness of body or mind; that condition in which its functions are duly and efficiently discharged.

World health organization defines "Health is a state of complete physical, mental and social well being and not merely an absence of diseases or infirmity. Recently this definition has been amplified and it has been added, "Attainment of a level of health that will enable every individual to lead a socially and economically productive life."

Modern concept of health

1. Biomedical concept: The absence of disease.
2. Ecological concept: Dynamic equilibrium between man and his environment.
3. Psychosocial concept: Health is influenced by social cultural economic and political factors of the people.
4. Holistic concept: Syntheses of all the above concept to recognize strength of social, economical, political and environment influence of health.

Dimension of health

1. Physical Dimension

Physical dimension purely refers to the perfect functioning of the body externally as well as internally. Externally having good physique, good appearance, good texture and complexion etc. physical dimension i.e. physical health means proper functioning of the systems and physical well being of the body, cumulative result being perfect and harmonious functioning of the human body.

2. Mental Dimension

Mental health is the balanced development of an individual's personality and attitudes which enable him to live harmoniously with his fellow beings. A balance between the individual and the surrounding world, a state of harmony between oneself and others, a co-existence between the realities of the self and that of other people, and that of the environment. It influenced by both biological and social factors.

3. Social Dimension

Social health is the ability to get along with one self and with others, to be independent but at the same time to realize how dependent one is on other. The quantity and quality of an individual's interpersonal ties and the extent of involvement with the community. A socially healthy person possesses the desirable qualities of integrity, unselfishness, forgiveness, sense of fairness, co-operation etc.

4. Emotional Dimension

Emotional health means emotional fitness and emotional control. A person can be called emotionally healthy if his emotions are always positive, and has full control over his emotions.

5. Spiritual Dimension

Spiritual health refers to that part of the individual which reaches out and strives for meaning and purpose in life.

6. Vocational Dimension

Vocational health emphasizes upon the problem of livelihood and ensures the fulfillment of the economic needs of an individual. Man's progress in all fields depends upon his capacity to earn his livelihood and to meet his wants. Vocational satisfaction provides him social efficiency, social status, social prestige, emotional stability and mental relaxation. Vocationally satisfied individuals also contribute to the increase in production and national wealth.

7. Educational Dimension

Education causes certain changes in one's behavior and attitude enabling one to understand his responsibility to the society and the nation. Educational dimension of health i.e. health education has heavy responsibility to discharge. Health education creates awareness regarding health rules, promotes health, builds up healthy environment and shows the path to follow towards the healthful living.

8. Nutritional Dimension

Good nutrition is a basic component of health. It is of prime importance in the attainment of normal growth and development, and in the maintenance of health through out life.

9. Environmental Dimension

Sanitation is one of the important aspects of environmental health. It is the quality of living that is expressed in clean home, clean neighborhood and clean community. Environmental sanitation can be defined as the control of all those factors in man's physical environment which exercise or may exercise a negative effect on his physical development, health and survival.

10. Curative and preventive dimension

This dimension deals with the study and application of curative medicine and preventive measures for the preservation of the health of an individual.

Positive health

The state of positive health implies the notion perfect functioning of body and mind. It conceptualizes health biologically, psychologically spiritually and socially.

Wellness

Wellness has been defined as "an approach to personal health that emphasis individual responsibility for well being through the practice of health promoting life style behaviour"

Health promoting behaviors

- 7 to 8 hours sleep
- Limit sugar in diet
- Limit cholesterol in diet
- Consume fiber
- Maintain proper weight
- Limit fat in diet
- Avoid alcohol drinking
- Avoid smoking
- Exercise regularly

Health Education:

Health education is rather an abstract term, meaning different things to different people. To some a matter of public relations stating the activities of health department, and to many others it provides knowledge about health and diseases.

"Anything that educates anyone in the matter of health is health education. It is concerned with the knowledge of all round healthy habits."

- Thomas Wood

"Health education is concerned with the health related behavior of the people."

- Sophie

Objective of health education

- To ensure that health is valued as an asset in the community.
- To equip the people with skill, knowledge and attitude to enable them to solve their health problems by their action and efforts.
- To promote the development and proper use of health services.

Principles of Health Education

- Health education programme should be regularly evaluated through periodical appraisals.
- Good human relations are of utmost importance in learning.
- Involvement of a local leader, teacher, well known personality, priest etc.
- A close study of relevant behavioral sciences is necessary for health education.
- Health education should not become an artificial situation or formal teaching - learning.

Importance of health education

- Health education provides the scientific facts of community hygiene that could help in preventing and eradicating many diseases and remove ignorance.
- Health education has a very significant role to play as it comprises health knowledge, health habits and health attitudes.
- Health education helps an individual to distinguish between good and bad health habits and encourages him to make good habits as enduring and lasting healthful behavior.

Assessment Activities

- Assignment on Health education.
- Health survey report.

T E Questions

1. Which dimension of health emphasizes on the quantity and quality of an individual's interpersonal ties and the extent of involvement with the community?
A) Spiritual dimension B) Emotional dimension C) Social dimension
2. "Good nutrition is a basic component of health". Substantiate the statement.
3. Explain how health education helps to build a healthy nation.

Unit - 3

POSTURE AND CORRECTIVE MEASURES

Introduction

Good appearance and good posture of an individual conveys good impression of his well being. There is a definite relationship between good posture and good health. The knowledge about posture and the need to maintain a good posture enables an individual to follow good health habits so as to lead a healthy life.

Learning outcomes

On completion of this, the learner will be able to

1. Distinguish between good posture and bad posture.
2. Point out advantages of good posture.
3. Instruct causes of poor posture.
4. Examine postural deformities and propose corrective exercises for the deformities.

Posture - meaning

Posture is essentially the position of the body in space. Optimal posture is the state of muscular and skeletal balance that protects the supporting structures of the body against injury or progressive deformity, whether at work or rest. Correct posture involves the positioning of the joints to provide minimum stress on the joints of the body.

Posture is the correct alignment of the body segments.

The meaning of posture varies from individual to individual. One posture which may be considered good for one individual may not hold true for another individual. It is well high impossible to lay - down strict or absolute standards for a universally good posture.

For each person, the best posture is that in which the body segments are balanced in the position of least strain and maximum support. This is an individual matter.

Types of good posture

- **Inactive posture (static)**

When a person is sleeping or having rest and body requires minimum muscular efforts.

- **Active posture (Dynamic)**

Where integrated muscular activity is required

Active posture may be static or dynamic. Static posture is one where the body is passive, not active or changing stance and forces are acting in equilibrium. Dynamic posture is one where the body is in motion, active and changing its stance.

Importance of a good posture

Good appearance and good posture of an individual conveys good impression of his well being. It reflects the alertness, activeness, agility and wholesomeness of an individual's personality. Good posture allows the minimum or economical use of energy, efforts and time whereas poor posture results in excessive utilization of energy. There is a definite relationship between good posture and good health. Good posture enables an individual to follow good health habits so as to lead a healthy life.

It has been observed that an individual who possess good posture is more agile, has better flexibility, and has co-ordinate, rhythmical and graceful movements. Good posture also makes it possible to attain such positions which are conducive to efficient movements. Such posture further helps in developing the strength, physical fitness and athletic ability in an individual. If the body is well balanced and well aligned the center of gravity of each segment will fall in straight vertical line and the weight bearing segments will be in proper alignment, thereby providing stability and support with minimum stress and strain while standing as well as motion position. Good posture enables an individual to feel relaxed, comfortable and at ease while efficiently performing different kinds of movements necessary for daily living. To maintain good posture one exerts much less muscular efforts as compared to a bad posture.

Common postural deformities

There are number of postural deformities which may be acquired or may congenital. Each type of postural deviation has its own peculiar causes and effects. Each postural deformity, therefore, demands and requires proper attention and specific treatment for correcting the same.

Kyphosis

In kyphosis, the convexity of the thoracic spine is increased. The sternum is depressed and the rib cage is lowered resulting in a decrease in the thoracic volume.

Corrective measures: Through regular and appropriate

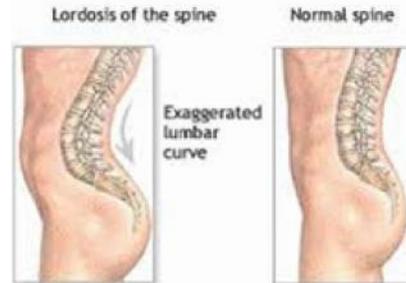


exercises the extensors should be strengthened and tonus should be improved. Swimming is recommended as an important exercise and performing chakrasana and bhujangasana are also beneficial as remedial measures.

Lordosis

Lordosis is an increased posterior convexity of the normal lumbar curve accompanied by a forward tilt of pelvis.

Corrective measures: it is necessary to develop the strength in the abdominal muscle and exercises should be undertaken to control the position of pelvis. For effective strengthening of the muscle it is recommended to sit on a bench against a wall and pushing the trunk backwards so that it touches the wall in the lumbar region. Another beneficial exercise is by laying on the back on the floor with hip flexed feet vertically over the face and bicycle. Performing Halasana is also beneficial.



Scoliosis

The lateral curvature of the spine is called scoliosis. Sideward curvature or deviation of the spine, with the shoulder lower and hip higher on one.

Corrective measures: corrective measures include hanging oneself from the hands, by developing strength in spinal extensors through corrective exercises. lateral bending to the side of convexity. E.g Trikonasana will help in developing those muscles which have become relaxed and stretched.



Flat foot

Flat foot is a formal reference to a medical condition in which the arch of the foot collapses, with the entire sole of the foot coming into complete or near-complete contact with the ground

Corrective measures: For correcting functional flat foot one should exercise by rising on the toes, by climbing stairs on the toes, by rope skipping, and by cycling.



Knock-knee

Knock-knee is a condition, where the knees angle in and touch one another when the legs are straightened.

Corrective measures: The main cause of knock knees is the weakness of muscles and ligaments and also the softness of bones of the knee region. To remove this deformity, extra care should be taken while walking. Activating and developing the arches of the feet, Waking up



the inner leg muscles (adductors), and Learn how to move the inner ankle bone inwards towards the outer ankle bone, and upwards towards the knee.

Causes of Postural Deformities

- **Injury :** When bone, ligaments or muscle is injured, it is likely to weaken the support at the point and throw the framework out of balance. When such condition exists, it is not possible to have a perfect posture.
- **Disease :** Posture is greatly effected by the disease that weaken the bones or the muscles or cause the joints to lose their strength or mobility.
- **Habit :** Habits of posture, whether good or bad, are acquired in the same way as the habits of walking, speaking or sitting, i.e. by practicing a certain type of coordination the act becomes unconscious and habitual.
- **Heredity :** Heredity is another factor which is responsible for poor or defective posture. Heredity defects like kyphosis and other genetic defects may cause poor posture.
- **Mental attitude :** The posture is the manner in which we carry or hold our body and it is bound to reflect our mental attitude. Feelings of happiness, confidence and satisfaction help in maintaining a balance and erect posture.
- **Improper clothing :** The type of dress one was also has impact on individual's posture. For example wearing tight fitted dress, tight shoes, high heel shoes etc. will result in adopting poor posture.
- **Improper diet or malnourishment :** Improper diet or malnourishment may result in various diseases due to deficiencies of vitamins and minerals e.g. rickets etc. which result in adopting faulty and poor posture.
- **Lack of exercise :** Exercise tone up the spinal nerves and abdominal organs, improves appetite and digestion, promotes flexibility and co ordination, reduces mental strain, provides energy, and improves the physical ability and efficiency.
- **Lack of awareness :** Many people are unaware regarding the concept of posture and continue to follow wrong or faulty posture. This become their permanent habits a life style which leads to posture defects and deformities.
- **Obesity :** Obesity or undue body overweight puts extra stress and strain on the muscular as well as skeletal structure of the body which results in posture deviation.

Assessment Activities

- Posture test report
- Corrective exercise chart for different postural deformities

T E Questions

1. If the postural deformities of the students are identified in the early stages it can be rectified by using some remedial exercises. Suggest some corrective exercises for various postural deformities.
2. What are the advantages and benefits of good posture?
3. Lack of physical fitness may lead bad posture. Explain the role of physical activity for the maintenance of good posture.

Unit - 4

SPORTS NUTRITION

Introduction

Food supplies the energy for every action we undertake. 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. Different physical activity requires different quantity of energy and the source of energy also varies. The energy requirements and the source of energy are the main concepts of this unit.

Learning outcomes

On completion of this, the learner will be able to

1. Distinguish between different energy nutrients.
2. Recognize the role of nutrients during physical activity.
3. Implement balance diet.
4. Suggest the diet before, during and after physical activity.

Nutrition is the science that deals with food and its uses by the body. Food provides us with the energy we need for growth, physical activity and for basic body functions. Food also supplies us with the materials to build and maintain the body and to promote resistance to disease. Food can be categorized into six classes of nutrients each with unique chemical structure and a specific function within the body. The six categories include water, minerals, vitamins, proteins, fats and carbohydrates.

Carbohydrates : carbohydrates are classified as either monosaccharide, disaccharides or polysaccharides, depending upon the number of simple sugars present in the carbohydrate compound. Monosaccharides are the simple sugars that cannot be made to a simpler form. The most common monosaccharides are glucose, fructose and galactose. Glucose is formed as a natural sugar in food or it can be synthesized in our body. Glucose is used directly by the cells for resynthesis of energy, stored in the muscle and in the liver as glycogen, or converted to fats to be stored as energy in the adipose tissue. Fructose is present in large quantities in fruits. Galactose is produced from milk sugar. In our body fructose and galactose are converted into glucose to generate energy. Disaccharides or double sugars are formed from the combination of two monosaccharide molecules. The three important disaccharides are sucrose, lactose and maltose. Polysaccharides are formed by the combination of three or more simple sugars. The polysaccharides are generally classified into plant and animal polysaccharides. The two major plant polysaccharides

are starch and cellulose. Glycogen is the animal polysaccharide. 1 gram of carbohydrate provide 4 calorie of energy.

Fats: Fat provides 9 calories per gram, Fat is essential for the proper functioning of the body. Fats provide essential fatty acids, which are not made by the body and must be obtained from food. They are important for controlling inflammation, blood clotting, and brain development.

Fat serves as the storage substance for the body's extra calories. It fills the fat cells (adipose tissue) that help insulate the body.

Protein: Proteins are the major structural components of the cells, enzymes and many hormones. Protein is necessary for growth and it is also needed for the repair and maintenance of body tissues. Proteins are also potential source of energy, but they are generally spared when fats and carbohydrates are available in adequate quantities. Proteins are made up of amino acids and over twenty different amino acids have been identified and of these nine are considered to be essential as part of the daily food intake. Many of the amino acids can be manufactured or synthesized by the body. The caloric value of protein is 4 calorie per gram.

Vitamins: Most vitamins serve as essential parts of enzymes that are vital to the metabolism of fats and carbohydrates. Thus although vitamins do not in themselves yield energy, they are essential to life. Vitamins are classified as water soluble and fat soluble. The water soluble vitamins are vitamin C and B complex vitamins. The fat soluble vitamins are A, D, E and K.

Minerals: Minerals are important for proper bodily functions and construction of certain tissues. Calcium, potassium, sodium, iron and iodine are few of the more important required minerals.

Water: Water has no caloric value and it does not provide any nutrients to our body. Water constitutes about 40 to 60% of individuals total body weight. Water is necessary for digestion, absorption, circulation and excretion. .

Energy nutrients

Carbohydrates, fats and proteins are referred to as the three energy-yielding nutrients because they provide our body with energy.

Food requirements

The amount of food necessary for each day depends upon a person's energy needs. These energy needs are directly related to periods of rapid growth, age, sex, body

built and physical activity. The percent contribution toward the total caloric intake for each of the three food stuffs are Protein: 10-15% Fat: 29-30%
Carbohydrate: 55-56%

Anaerobic and aerobic energy

The major purpose of anaerobic and aerobic metabolism is to provide energy for body cells. In anaerobic metabolism the energy is released in the absence of oxygen and in aerobic metabolism energy is released in presence of oxygen. Anaerobic metabolism uses carbohydrates (glucose & glycogen) exclusively to release energy whereas aerobic metabolism can use all three foodstuffs (carbohydrates fats and proteins) for its fuel. Fat and protein are not used as anaerobic energy sources.

Energy source during rest and activity

Under resting conditions about two third of the food fuels are contributed by fats and the other one third by carbohydrates. Contribution of protein as a food fuel is negligible. The aerobic system is the only energy system in operation.

Both aerobic and anaerobic system contributes energy during exercise however their relative role depends upon the type of exercise performed. Short duration highly intensive activities such as 100 m, 200 m, 400m runs and other events lasting up to 2-3 minutes, the major food fuel is carbohydrates with fats minor and proteins negligible. The predominant system is anaerobic. When the activity extends in time for 10 minutes or longer in such cases, aerobic system dominates and the major food stuffs are again carbohydrates and fats. For activities up to 20 minutes (continuous running) carbohydrates generally are the dominant fuel source for energy while fat play relatively minor role. As the activity proceeds the utilization of fat steadily increases whereas the usage of carbohydrates decreases.

Balance diet

A diet which gives the body all the nutritional requirements in the right proportion is known as balance diet.

Diet before activity

It is ideal to fuel up two hours before exercise by:

- Hydrating with water.
- Eating healthy carbohydrates such as whole-grain cereals (with low-fat or skim milk), low-fat or fat-free food, rice, fruits and vegetables.
- Avoiding saturated fats and even a lot of healthy protein because these types of fuels digest slower in the stomach and take away oxygen and energy-delivering blood from the muscles.

5-10 minutes before the exercise, can eat a piece of fruit such as an apple or banana. The key is to consume easily digested carbohydrates, so that the athlete doesn't feel sluggish.

Diet during activity

The athlete, who trains for several hours, should keep the body hydrated with small, frequent sips of water. Consuming too much of water at a time may fill the stomach and may disturb the performance. Don't need to eat during a workout that's an hour or less. But, for longer, high intensity vigorous workouts, recommends eating 50-100 calories every half hour of carbohydrates such as an energy bar or banana.

Diet after activity

After the workout it recommends refueling with:

- **Fluids :** Should drink water. Blend the water with 100% juice such as orange juice which provides fluids, carbohydrates.
- **Carbohydrates:** We burn a lot of carbohydrates, the main fuel for the muscles, when we exercise. In the 20-60 minutes after the workout, our muscles can store carbohydrates and protein as energy and help in recovery.
- **Protein :** Can eat things with protein to help repair and grow the muscles. It's important to realize that these are general guidelines. We have different digestive systems and a lot depends on what kind of workout we are doing.

Water loading

Drinking water in sufficient quantities will minimize dehydration reduce the rise in internal body temperature and lessen the stress placed on the circulatory system. One needs to drink 150% of any fluid deficit in the 4-6 hours after exercise to account for ongoing sweat and urinary losses. When fluid losses are high and/or rapid rehydration is required, sodium replacement may be required. Sports drinks, oral rehydration solutions and salty foods can all contribute to sodium replacement

Assessment Activities

- Project on different food stuffs and its caloric value.
- Discussion, participation and report on balanced diet.

T E Questions

1. A person running for more than an hour utilizes more amount of energy from A)Carbohydrate, B) Fat C) Protein
2. A sportsman should be very careful while taking his pre game meal. How pre game meal of a sportsman become so important.
3. Water is not an energy nutrient, then what is the role of water while doing physical activity?

Unit - 5

SPORTS PSYCHOLOGY

Introduction

Sports psychologists play vital role in preparing the athletes to elite level where the winner is decided by the person's psychological level. Here, the factors effecting sports performance is included. The personality of a person involving in sports will be unique. Sports play vital role in developing the personality of a sports person. Motivated sports person can do wonder in competitions.

Learning outcomes

On completion of this, the learner will be able to

1. Point out the psychological factors affecting sports performance
2. Identify different personality traits.
3. Categorize personality traits.
4. Illustrate the role of sports in developing personality.
5. Differentiate types of motivation.
6. Recognize the role of teacher in motivating students.

Meaning of sports psychology

The word psychology refers to the study of human behavior, and sports psychology denotes a sub category of psychology that deals with the behavior of athletes and teams engaged in competitive sports. Sports psychology is that branch of psychology which is intimately connected with human behavior on the play field, both under practice and competitive situations, with a view to bring qualitative improvement in performance and maintain the same even during the stresses of competition. Sports psychology is an important ingredient of sports training program and deals with the way in which various psychological states and traits influence sports performance.

Psychological factors affecting sports performance

1. **Individual difference among the athletes :** Each individual is unique to oneself. Some athletes may be outstanding and extrovert where as others may be shy, introvert and withdrawn, and they may also differ in their levels of perception. Some athletes are born strong psychologically while others have weak dispositions.
2. **Personality :** Personality traits are basic to sports excellence. It is necessary to identify and cultivate those personality traits which are most conducive to the performance in sports.

3. **Intelligence :** Intelligence is the aggregate mental capacity or energy of an individual to act purposefully, to think rationally, and to deal effectively. Sports activities involve complex skilled actions. Since all skilled behavior is intelligent behavior, relationship between sports performance and intelligence cannot be denied.
4. **Attitude :** Attitudes are about thoughts and feelings. Attitude is often thought to predict behavior. Positive beliefs and values concerning physical activity result in development of good and positive attitudes, enabling the athlete to strive hard for better performance.
5. **Motivation :** Motivation is a force, a 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 purpose. It is thus necessary to find out ways and means of motivating athletes for better physical performance.
6. **Aggression :** Aggression is a part of human behavior and is necessary for an individual to live and struggle for higher achievements. Struggle for supremacy, dominance, and excellence in sports obviously involve aggression. Aggression may help in the performance of an athlete because it arouses the athlete to put in harder effort for the success of the team.
7. **Arousal and activation :** The term arousal reflects the varying degrees of readiness to perform physically, intellectually, or perceptually. Activation is a short term change of energy mobilization, and implies rising of energy above an individual's arousal, base line, for a brief period.
8. **Anxiety:** Anxiety means disturbed state of mind; emotional reactivity; arousal; nervousness; and unrealistic and unpleasant state of mind. Anxiety is an essential ingredient of any competitive situation and without certain level of anxiety, there cannot be competitive performance. Neither too high, nor too low level of anxiety is conducive to sports performance.
9. **Attention and concentration :** Attention is the concentration of consciousness upon one object rather than 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 ones mental and physical power as effectively as possible.
10. **Mental imagery :** Mental activity enables the athlete 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 organize himself in a better way.

11. **Group dynamics** : A sports team is comprised 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. Group dynamics and performance are thus mutually influential, and are further influenced by the stability of the personnel concerned with the team.

PERSONALITY

Meaning of personality

Personality reveals the psychological makeup of an individual through his behavior. In fact, it is the quality of a person's total behavior. Personality is a dynamic and continuous process of learning in which the individual acquires the typical modes of responses. The word personality is used to subsume all the factors inherited or acquired, which make up an individual. It is the total sum of what one is (his psychological make-up), one's typical response patterns (to adjust in the environment or how one response to the world around him), and behavior patterns (how one behaves differently in different situations).

Personality Traits

Psychologists have defined a trait as a mode of behavior. Traits are not creations in the mind of the observer, nor are they verbal fictions; they are accepted biophysical facts, actual psychological dispositions. These are specific qualities of behavior or adjustive patterns, such as reactions to frustrations, ways of meeting problems, aggressive or defensive behavior and outgoing or withdrawing behavior in the presence of others. Traits are a product of learning though they are based on hereditary foundations. They are molded mainly by child's training in the home and school, and by imitating a person with whom the child identifies himself. Later, the child will emulate the traits of members of the peer group. Traits continue in a relatively unchanged form over a period of time and can, however, be modified with the experience.

Role of sports in personality development

A balanced personality is a product of a sound body and a well developed mind. As most of the elements of physical education can play a vital role in shaping the personality of a child-Games and sports promote growth and development. Growth involves structural quantitative change where as development is a process of a

quantitative transformation which brings about progressive changes towards maturity. Athletic physique does enhance one's personality.

The activities like yoga in which all the people from any age group can participate help in improving meditative power. The aim of meditation is to relax the body and mind to create a focused awareness.

The activities like calisthenics are essential to achieve bodily health and grace of movement. The gymnastic exercises are responsible for development of mind, as a single exercise requires hardly ten to fifteen seconds alertness of mind is a prime importance and without full concentration of mind it is impossible to do it.

The team events like Football, Volleyball, Hockey and Basketball promote strong collective efforts towards common objective that help children to inculcate in them the noble qualities of discipline, leadership had help them to shape their character. They also promote endurance, flexibility, speed, co-ordination of skills that create a sense of beauty and precise body control.

All the physical activities must be learned and that involves analytic thinking, analyzing and interpreting new situations. This mental exercise enhances the intellectual abilities of the participants and broadens their mental horizon. Participation in sports and other physical activities provides avenues for social interactions and lays foundations for amicable relationships. It also enables us to develop tolerant attitude toward other players as well as spectators. Participation in sports trains an athlete to manage and control his aggression and temper, which help in the development of a balanced personality.

Apart from these, sports give immense pleasure of creation, joy of fulfillment and they are the wonderful sources of recreation.

Motivation

Motivation- meaning

Motivation is one of the most fascinating and important area in human psychology. Motivation has immense effect on learning. In the absence of motivation either there will be no learning or very little learning. Motivation is a process through which an individual is inspired, stimulated, goaded or coaxed to act in a particular fashion or manner towards a particular direction.

Types of Motivation

Motivation can be classified into two categories

A) Intrinsic Motivation

The word intrinsic means belonging naturally, or something inherent. If it is the very natural urge, the inner appetite or inherent interests which compel an athlete to initiate and maintain the activity, he is said to be intrinsically motivated. In this type of motivation the athlete engage themselves in an activity for their own sake. An athlete can said to be intrinsically motivated when, all the intents and purposes, he is participating for the pure enjoyment and satisfaction he derives from the activity itself. The athletes who are intrinsically motivated strive inwardly to be competent and self determining in their quest to master the task.

B) Extrinsic Motivation

When an individual initiates and sustains an activity as a result of external pulls, attractions forces, incentives etc. it is called extrinsic motivation. When an athlete is competing because some other goals or rewards might result from his performance, he can said to be extrinsically motivated. Where motivation is controlled or regulated by external means or factors such as rewards, prizes, social recognition, position, jobs etc. this type of motivation is called extrinsic motivation.

Role Of Teacher In Motivating Students

Motivated students are more excited to learn and participate. Some students are self-motivated, with a natural love of learning. But even with the students who do not have this natural drive, a great teacher can make learning fun and inspire them to reach their full potential. The personality, character, effectiveness and preparation of a teacher has immense effect upon the students, as they try to imitate the teacher, absorb the attitude and feel his mood.

Here are five effective ways to get the students motivated:

1. Encourage Students

The teacher should encourage open communication and free thinking with the students to make them feel important. Praise the students often. Recognize them for their contributions. If the classroom is a friendly place where students feel heard and respected, they will be more eager to learn. A word of "good job" or "nice work" can go a long way.

2. Get Them Involved

One way to encourage students and teach them responsibility is to get them involved in the classroom. Make participating fun by giving each student a job to do. Give students the responsibility of various activities. Make students work in groups and assign each a task or role. Giving students a sense of ownership allows them to feel accomplished and encourages active participation in class.

3. Offer Incentives

Setting expectations and making reasonable demands encourages students to participate, but sometimes students need an extra push in the right direction. Offering students small incentives makes learning fun and motivates students to push themselves. Rewards give students a sense of accomplishment and encourage them to work with a goal in mind.

4. Draw Connections to real Life

"When will I ever need this?" This question, too often asked by the students, indicates that a student is not engaged. If a student does not believe that what they're learning is important, they won't want to learn, so it's important to demonstrate how the subject relates to them. They may never be excited about the activity but if they see how it applies to them, they may be motivated to learn attentively.

Assessment Activitiy

- Personality trait assessment using questionnaire.
- Seminar and its report on motivation.

T E Questions

1. By regular participation in sports and games one can control emotions. Substantiate this statement with an example.
2. Offering students small incentives make learning easier. In psychology what this technique is known as? Write different types of this technique.
3. Better performance will result if each member of the team merges his personal feelings and abilities into a total team effort. This can be called as
 - A) Group dynamics. B) Mental imagery. C) Individual difference.

Unit - 6

SOCIOLOGY IN SPORTS

Introduction

Participation in games and sports provides a service to the individual by preparing him/her to the challenges of competition during later life in the society. This includes the development of mental and physical fitness, good character, discipline, competitiveness and courage, and opportunities to experience challenges leading to personal achievement and social recognition.

Learning outcomes

On completion of this, the learner will be able to

1. Illustrate social values of sports.
2. Choose different recreational activities for different population.

Sociology - meaning

Man is a social animal. He cannot live a life alone. He has a tendency to associate with other people because he is a social creature by nature. Sociology is the systematic study of the development, structure, interaction, and collective behavior of organized groups of human beings. Different institutions like family, school, state etc. socialize an individual.

Sociology of sport, alternately referred to as sports sociology, is a sub-discipline of sociology which focuses on sports as social phenomena. It is an area of study concerned with various socio-cultural structures, patterns, and organizations or groups involved with sport.

Role of play and sports in socialization processes

Sports is a viable means towards socialization because it provides rich opportunities in most of the social processes involved in the transmission of cultural behavior. Through games and physical activities socialization takes place in the home, the school, the play grounds, the streets and any other place where the games are played.

The following aspects of the social system are integral part of the socialization process which operate in various sport situations.

- A) **Role play:** Ways of behaving according to the assigned duty are roles. This is hard fact that no experience can offer more opportunities for role playing than sports. It is through role playing in sport activities that the child can develop body image, thereby enhancing self-image, which is the basis of a healthy personality.

- B) Status :** The modern society is a sport oriented one, for youth as well as adults, status is related to participation in sport. Status of one's group is related not only to role playing, but also to leadership. Probably, there is no area today where one's status in the group is predicted on one's ability alone as much as in the area of sport. Status, one's attained, leads to different role playing and usually to a higher level of leadership.
- C) Social stratification :** Social classification is another aspect of the process of socialization. It too, can effect personality and self image as individuals are born, grown and developed in a particular social class. Sports and games provide an environment in which there is a less social stratification (classification). However, sports can serve a catalyst for social mobility through which one moves upward.
- D) Self image :** Participation in games and sports can affect the self image of the participants and thereby enhance self esteem, self control, and a sense of security. Fundamentally this is the child's body- image. Movement image as expressed in sports and games is basic to body image.
- E) Competition and cooperation :** Competition and cooperation are two social processes that are highly related to sports and games. They are not only powerful forces in the socialization process, but also are motivators to learning in both intellectual pursuits and motor performance. Sports and games require competition but they also demand cooperation to participate in competitive sport.

RECREATION

Recreation means to regain lost vigor and get a sense of joy, refreshment and satisfaction. Recreation is life itself. Without recreation life is meaningless. The modern age is full of complexities, a man in order to survive has to do lot of physical and mental work, resulting in fatigue. Through recreation he can regain the lost vigor or energy. Recreation is concerned with those activities performed by an individual during leisure time or at hours not at work. Hence it is frequently referred to as leisure-time activity. Recreation education is aimed at teaching people to utilize their free time/leisure time in a constructive manner. To achieve this aim and to have value as recreation, activities must be suited to his physical, mental, emotional and social needs.

Characteristics of recreation

Recreation must have the following characteristics to benefit the participant to his fullest.

- A) **Leisure time:** To have recreation the activity must be engaged during one's free time. From this point of view one cannot leave during the working hours and engages in recreational activity.
- B) **Enjoyable:** The activity engaged in must be enjoyable not boring one.
- C) **Satisfaction:** The activity engaged in must bring immediate and direct satisfaction to the individual.
- D) **Voluntary:** The individual must have chosen recreation activity of his/her own choice. There must be no compulsion.
- E) **Constructive:** The recreational activity is constructive. It is not harmful to the participant, physically, mentally, emotionally, socially or in any other way. It helps one to become a better integrated individual.
- F) **Socially acceptable:** The recreational activity by socially acceptable and individually beneficial to the participants
- G) **Non- survival:** Eating or sleeping are not recreational activities in themselves. One may engage in a picnic in which a dinner or lunch is involved, but other parts of the affair such as the social games and fellowship are important elements of recreation activity, without which it will remain no more recreation activity.

Objectives of recreation

The field of recreation contributes to the satisfaction of basic human needs for creative self-expression; helps to promote total health- physical, mental, emotional and social; provides an antidote to the strain and tension of life; provides an avenue to abundant personal and family living; and develops effective citizenship and vitalizes democracy. The objectives are as follows:

- A) **Personal fulfillment:** Recreation recognize the need people who need it to become all that they are capable of becoming and contribute to reach their that recreation can make this goal.
- B) **Democratic human relations:** Recreation recognizes that it has goals that contribute to individuals as well as to the democratic society of which they are an integral part.
- C) **Leisure skills and interests:** Recreation has the goal of meeting the interests of people and developing skills that will provide the incentive, motivation and medium for spending free time in a constructive and worthwhile manner.

- D) Health and fitness:** Recreation recognizes the importance of contributing to reduce mental illness, stress and tension. It also has the goal to have physical activity in the modern society to make the people healthy and fit.
- E) Creative expression and aesthetic appreciation:** Recreation attempts to provide the environment, leadership, material and motivation where-creativity, personal expression and aesthetic appreciation on the part of the participant exists and develops.
- F) Environment for living in a leisure society:** Recreation plays an important role in encouraging such things as preservation of natural resources, construction of play grounds and recreation centers, and awakening the population to an appreciation of aesthetic and cultural values.

Assessment Activities

- Seminar and its report on sports sociology.
- Developing recreational activity.

TE Questions

1. In your school, a recreation club is expected to start to attract the public. Prepare a pamphlet showing the essential characteristics of recreation.
2. Recreation means to regain of lost vigor and get a sense of joy, refreshment and satisfaction.
 - (a)How the lost vigor of the individuals recharges through recreation?
 - (b)What are the essential characteristics of recreation?
3. Suggest some methods to make changes in an introvert student who is reluctant to mingle with his classmates.

PRACTICAL

Unit 4.7 YOGIC SCIENCE

Introduction

In this section different types of asanas- standing and sitting asanas, prone and supine lying asanas, forward and backward bending asanas, relaxing and meditation asanas has been covered in detail with all stages from starting position to final pose. Hand position in Pranayama, different types of breathing, eight types of pranayama, mudras and bandhas are also shown in detail.

Learning outcomes

On completion of this, the learner will be able to

1. Illustrate social values of sports.
2. Choose different recreational activities for different population.

General principles for asana practice

Time of practice: Asanas may be practiced at any time except after meals. The best time however, is the two hours before sun rise. This period is known as Brahmamuhurtha in Sanskrit. In evening two hours around sunset is also a favorable time.

Age limitation : Asanas can be practiced by people of all age groups, male and female.

Place of practice : The place should be well- ventilated room where it is calm and quite. Asanas may also practiced outdoors, but the surroundings should be pleasant

Blanket : Use a folded blanket of natural material for the practices as this will act as an insulator between the body and the earth.

Clothes: During the practice it is better to wear loose, light and comfortable clothing and remove spectacles, wristwatches and any jewellery

Empty stomach: The stomach should be empty while doing asanas and to ensure this, there should be an at least 3 to 4 hours gap after food.

No straining: Never exert undue force while doing asanas. Beginners may find their muscles stiff at first, but after several weeks of regular practice they may be surprised to find that their muscles are suppler.

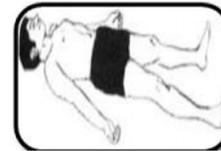
Inverted asanas: People with heart problems, high blood pressure, an active ear infection, or those who with problems should not practice postures where the neck is weight bearing.

Breathing: Always breathe through the nose unless specifications are given. Coordinate the breath with the asana practice.

Awareness: The purpose of asana practice is to influence, integrate and harmonize all level of being: physical, mental, emotional, psychic and spiritual.

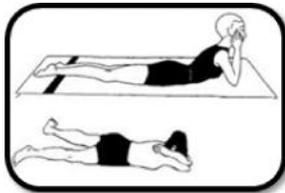
1. Savasana (Corpse pose)

Lie flat on the back with arms 15 cm away from the body palm facing upward, move the feet slightly apart to a comfortable position and close the eyes.



The head and spine should be in a straight line, Breathing should be natural and relaxed.

2. Makarasana (Crocodile pose)



Lie flat on the stomach, raise the head and shoulders and rest the chin in the palms with elbows on the floor.

Keep the elbows together for a pronounced arch to the spine.

Relax the whole body and close the eyes, breath normally.

3. Sukasana (Easy pose)

Sit with leg straight in front of the body.

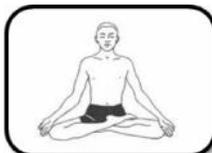
Bend one leg and place the foot under the opposite thigh.

Place the hands on the knees in chin or jnana mudra.

Keep the head, neck and back upright and straight, but without strain, eyes closed relax the whole body.



4. Ardha Padmasana (Half Lotus pose)



Sit with leg straight in front of the body.

Bend one leg and place the foot under the opposite thigh.

Bend the leg and place the foot on top of the opposite thigh.

Place the hands on the knees in chin or jnana mudra.

Keep the head, neck and back upright and straight, but without strain, eyes close relax the whole body.

5. Padmasana (Lotus pose)

Sit with leg straight in front of the body.

Bend one leg and place the foot under on top of the opposite thigh.

Bend other leg and place the foot on top of the opposite thigh.

Place the hands on the knees in chin or jnana mudra.

Keep the head, neck and back upright and straight, but without strain, eyes closed, relax the whole body.



6. Siddhasana

Sit with leg straight in front of the body.

Bend the right leg and place of the sole foot flat against the inner left thigh with the heel pressing the perineum.

Bend the left leg, push the toes and outer edge of the left foot into the space between the right calf and thigh muscles.

Place the hands on the knees in chin or jnana mudra.

Keep the head, neck and back upright and straight, but without strain, eyes closed relax the whole body.

Place the left ankle directly over the right ankle so that the ankle bones are touching and the heels are one above the other. Press the pubis with the left heel directly above the genitals.



7. Vajrasana (Thunder-bolt pose)

Kneel on the floor with the knees close together. Bring the big toes together and separate the heels, lower the buttocks on to the inside surface of the feet with the heels touching the sides of the hips. Place the hands on the knees, palms down. The back and head should be straight but not tense. Close the eyes, relax the arms and the whole body.

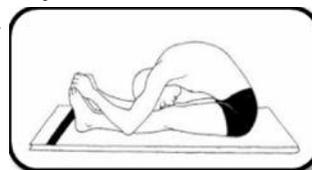


8. Paschimottanasana (Dynamic back stretch pose)

Sit on the floor with the legs outstretched, feet together and hands on the knees.

Slowly bend forward from the hips, sliding the hands down the legs.

Try to grasp the big toes with the fingers if possible, otherwise hold the heels, ankles or any parts of the legs that can be reached



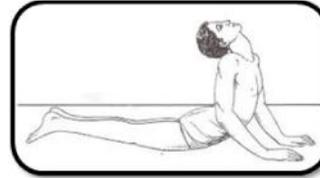
comfortably.

Hold the position for a few seconds. Relax the back and leg muscles.

9. Bhujangasana (Cobra pose)

Lie flat on the stomach with the leg straight, feet together and rest the forehead on the floor.

Place the palms of the hands flat on the floor by the side of the shoulder with fingers together.



Slowly raise the head and gently tilt the head backward, raise the neck and then the shoulders and the trunk using mainly the spine and back muscle.

In the final position the pubic bone remains contact with the floor.

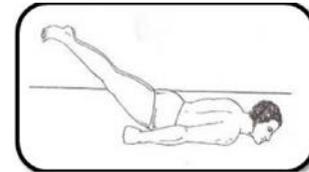
10. Shalabhasana (Butterfly pose)

Lie flat on the stomach with the legs and feet together.

The arms may be placed either under the body or by the sides, with the palms downward or the hands clenched.

Stretch the chin slightly forward and rest it on the floor throughout the practice.

Close the eyes and relax the body.



Slowly raise the legs as high as possible without straining, keeping them straight and together.

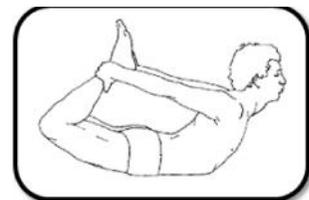
Hold the final position for as long as is comfortable without strain.

11. Dhanurasana (Bow pose)

Lie flat on the stomach with the legs and feet together and the arms beside the body.

Bend the knees and bring the heels close to the buttocks, hold the ankle with the hands.

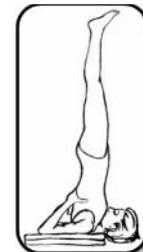
Arch back. Push the feet away from the body, lifting the thighs, chest and head together. Keep the arms straight.



12. Sarvangasana (Shoulder stand pose)

Lie on the back, slowly raise the legs to the vertical position keeping them straight.

When the legs are vertical, press the arms and hands down on the floor. Slowly and smoothly roll the buttocks and the spine off the



floor, raising the trunk to a vertical position.

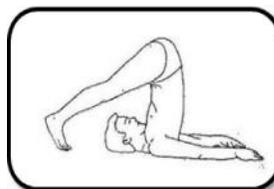
Bend the elbows and place the hands behind the rib cage and support the back, gently push the chest forward so that it presses firmly against the chin.

In the final position, the legs are vertical and in a straight line with the trunk. The body is supported by the shoulders.

13. Halasana (Plough pose)

Lie flat on the back, raise both legs to the vertical position keeping them together.

Press down on the arms and lift the buttocks, rolling the back away from the floor, lower the legs over the head.



Bring the toes towards the floor behind the head and touch the floor.

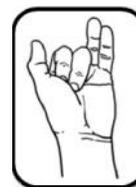
Pranayama

Hold the fingers of the right hand in front of the face.

The thumb is above the right nostril and the ring finger above the left. These two fingers control the flow of breath in the nostrils by alternately pressing on one nostril.

Hand position

Before practicing pranayama one has to do Nadi Sodhana Pranayama (Cleansing of nostril) and alternate nostril breathing as a preparatory exercise.



Nadi Sodhana Pranayama

Sit in any comfortable meditation posture.

Keep head and spine upright.

Relax the whole body and close the eyes.

Deep breathing for some time.

Adopt nasagra mudra with the right hand and left hand on the knee in chin or jnana mudra.

Close the right nostril with the thumb.

Inhale and exhale through left nostril 5 times - controlling the Breathing with hands.

The rate of inhalation and exhalation should be normal. After completing 5 breath release the pressure of the thumb on the right nostril and press the left nostril with the ring finger, Inhale and exhale through the right nostril 5 times keeping the respiratory rate normal.

Lower the hand and breath 5 times through both nostrils together, this is one round.

Alternate nostril breathing

Begin with equal inhalation and exhalation, using the ratio 1:1.

Close the right nostril with the thumb and inhale through the left nostril.

Close the left nostril with the ring finger and release the pressure of the thumb on the right nostril, the time of inhalation and exhalation should be equal.



Next inhale through the right nostril, at the end of inhalation close the right nostril, open the left nostril and exhale through the left nostril.

This is one round.

Alternate nostril breathing can be practiced with antar kumbaka (inner retention) later and with antar and bahiya kumbaka (external retention) in advance stage.

Types of Pranayama

In Hatha Yoga Pradipika of swatmarama eight types of pranayama (Ashta kumbaka) is given in detail they are;

- Surya bedana pranayama (vitality stimulating breath).
- Ujjayi pranayama (the psychic breath).
- Sitkari pranayama (hissing breath).
- Sitali pranayama (cooling breath).
- Bhramari pranayama (humming bee breath).
- Muurchaa pranayama (snting breathwooning or fainting breath).
- Bastrika pranayama (bellows breath).
- Plavini pranayama.
- Another type of pramatama is Kevela kumbaka.

1. Surya bedana pranayama (vitality stimulating breath)

Assume a comfortable meditation asana. Adopt nasagra mudra. Close the left nostril with the ring finger and inhale slowly and deeply through the right nostril. Exhale through the right nostril, keeping the left nostril closed with the ring finger.

2. Ujjayi pranayama (the psychic breath)

Imagine that the breath is being drawn in and out through the throat, gently contract the glottis so that a soft snoring sound is produced in the throat. Both inhalation and exhalation should be long deep and controlled.

3. Sitkari pranayama (hissing breath)

Hold the teeth tightly together, separate the lips, exposing the teeth. The tongue may be kept flat or folded against the soft palate, inhale slowly and deeply through the teeth, at the end of the inhalation close the mouth, exhale through the nose in a controlled manner.

4. Sitali pranayama (cooling breath)

Extend the tongue outside the mouth as far as possible without strain. Roll the sides of the tongue so that it forms a tube. Practice a long smooth and controlled inhalation through the rolled tongue. At the end of inhalation, draw the tongue in, close the mouth and exhale through the nose. A feeling of icy cooling will be experienced.

5. Bhramari pranayama (humming bee breath)

The lips should be kept close with the teeth slightly separated throughout the practice. This allows the sound vibration to be heard and felt more distinctly. Using the index or middle finger close the ears.

6. Moorcha pranayama (sinting breathwooning or fainting breath)

Slowly inhale through both nostrils with ujjayi pranayama, while gently and smoothly bending the heads slightly back. Perform shambhavi mudra. Straighten the arms by locking the elbow and pressing the knees with the hands. Retain the breath inside for as long as comfortable. Exhale and relax the arms. Close the eyes and slowly bring the head back to the up right position.

7. Bastrika pranayama (bellows breath)

Bastrika pranayama is the combination of kapalabathi and suryabedhana pranayama.

8. Plavini pranayama

In some books Kapalabathi is given under pranayama but in traditional Yogic texts it has been clearly mentioned under Satkriya (Cleansing process).

Nadi Shadana pranayama and Alternate nostril breathing (Anuloma Viloma Pranayama) are the preparatory practices of pranayama which is also described in the practical section.

In all types of pranayama the ratio between inhalation and exhalation should be 1:2. Through regular practice of pranayama all breathing problems can be cured.

Mudras

The mudras are advanced practices which should be practiced only after mastery over asana and pranayama. There are three types of mudras hastha mudra(mudras with hands), kaya mudra (mudras involving body parts) and mano mudra (involving face).

1. Jnana Mudra

Assume a comfortable meditation posture. Fold the index finger so that they touch the tip of the thumb. Straighten the other three fingers of each hand so that they are relaxed and slightly apart. Place the hands on the knees with the palms facing down. Relax the hands and arms.



2. Chin Mudra

Chin mudra is performed in the same way as jnana mudra, except that the palms of both hands face upwards, with the backs of the hands resting on the knees. Relax the hands and the arms. The thumb represents the universal consciousness and the index finger represents the individual consciousness and the other three fingers are three gunas viz. Satva guna, Rajo guna and Tamo guna.

3. Bhairava mudra



Assume a comfortable meditation posture with head and spine straight.

Place the right hand on the top of the left so that the palms of both arms are facing upward. Both hands rest in the laps, keeping it motionless.

4. Viparit Karani Mudra

Lie flat on the back with the legs and feet together in a straight line. Place the hands and arms close to the body with palms facing down.

Raise both legs keeping them close and together, move the legs over the body towards the head.

Roll the spine from the floor taking the legs further over the head.

Turn the palms up, bend the elbows and let the top of the hips rest on the base of the palms near the rest. Bring the legs over the head so that the eyes look straight at up the feet.

In the final position the weight of the body rest on the shoulders, neck and elbows. The trunk is at 45 degree and angle to the floor and legs are vertical.



5. Shambhavi Mudra

Sit in any meditation asana. Close the eyes and relax the body.

Slowly open the eyes and look ahead at a fixed point, keeping the head and the whole body absolutely still next look upward and inward, focusing the eyes at the eyebrow center.

Satkriyas (Cleansing process)

There are six satkriyas which cleanses all parts of the body; they are tratak, neti, kapalabathi, nouli, dauthi and basti. According to traditional Yogic texts those who are normal and healthy need not do Satkriyas. People with excess fat or bile or any other abnormality should do the cleansing process.

1. Tratak (Consentrated gazing)

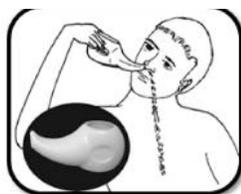
Light a candle and place it on a small table so that the flame is exactly at eye level when sitting and at one arm distance.

Sit in any comfortable meditation asana with the head and spine erect.

Open the eye and gaze steadily at the flame, try not to blink, when the eyes begin to tear close and gaze at the after image .



2. Jal neti (Water cleansing)



Fill the neti pot with the prepared salt water.

Stand with legs apart, lean forward and tilt the head to one side, breath through the mouth.

Gently insert the nozzle into the upper most nostrils.

The nozzle should press firmly against the side of the nostril so that no water leakage occurs.

Tilt the neti pot in such a way that water runs into the nostril and not down the face. Keep the mouth open.

Water comes through the other nostril normally without much difficulty.

3. Kapalabathi (Frontal brain cleansing)

Sit in any meditation asana, exhale through both nostrils with a forceful contraction of the abdominal muscles.

Inhalation is passive and spontaneous, in one minute 30 to 120 strokes can be done according to ones capacity.



4. Nauli (Abdomenal messaging)



Stand with a feet about a meter apart, take a deep breath in through the nose and exhale through the mouth.

Perform Jalandara bandha while maintaining bahir kumbaka,

Suck the lower abdomen; contract the rectus abdominis muscles, so that they form a central arch.

5. Douthi

Drink at least 6 glasses of prepared water, Lean forward, keeping the trunk as horizontal as possible.

Open the mouth and place the middle and index fingers of the right hand as far back on the tongue as possible, gently rub and press the back of the tongue.

During the expulsion of water the fingers may be removed from the mouth, when the flow of water ceases again place the finger in the mouth and repeat the process. Continue until the stomach is empty.



6. Basti (Colon Cleansing)

The word basti also widely written as vasti. It is the cleansing of the colon, when the colon is purified old stool is removed and gas expelled. This technique should be learned under the guidance of a competent teacher.

UNIT 4.8 CRICKET

Introduction

In this practical unit students are given opportunity to mark the court individually. They are provided with the practical knowledge of basic skills like Grip, Stance for batting, forward and backward defence and different drives. They also learn skills of bowling, throwing and catching. A thorough knowledge regarding the rules, regulations and officiating skills also imparted to the students.

Learning outcomes

On completion of this, the learner will be able to

- 1 Implement Court marking.
- 2 Execute various Skills of Cricket.
- 3 Act as official in a Cricket match.

Unit 4.9 KHO-KHO

Introduction

In this practical unit students are provided with the practical knowledge of basic skills of the game and marking the court with all minute measurements. They also learn sitting in square, giving kho, running and chasing. A thorough knowledge regarding the rules, regulations and officiating skills are also imparted to the students.

Learning outcomes

On completion of this, the learner will be able to

- 1 Implement Court marking.
- 2 Execute various Skills of Kho-Kho.
- 3 Act as official in a Kho-Kho match.

Unit 4.10 HANDBALL

Introduction

In this practical unit students are given opportunity to mark the court individually. They are provided with the practical knowledge of basic skills like holding the ball, passing skills, catching skills. They also learn skills of dribbling and throwing shot. A thorough knowledge regarding the rules, regulations and officiating skills are also imparted to the students.

Learning outcomes

On completion of this, the learner will be able to

- 1 Implement Court marking.
- 2 Execute various Skills of Handball.
- 3 Act as official in a Handball match.

Unit 4.11 SPECIALIZATION

Introduction

Students are given opportunity to specialise in one game which enables them to attain proficiency and achievement in any one game of their choice. During specialization student get opportunity to practice a particular game for two hours daily which helps to expand the practical and theoretical knowledge. During specialization one learns all the rules and regulations thoroughly which in turn give an additional opportunity to build ones career as a qualified official of a particular game.

Learning outcomes

On completion of this, the learner will be able to

- 1 Perform well in their specialized game at various competitions.
- 2 Act as an official in their specialized game.
- 3 Teach and coach their specialized game.

Unit 4.12 INTRAMURALS

Introduction

Intra mural is a competition conducted within an institution. Here an intramural committee is formed to organize and conduct various competitions. The VHSE first year and second Year students will be divided into three houses.

Learning outcomes

On completion of this, the learner will be able to

1. Organizations of selected games.

Extended Activities

- Assisting Yoga Experts.
- Preparing Yoga and Pranayama charts for individuals.
- Visiting Yoga centers.
- Preparing personal fitness card.
- Practice teaching in various schools.
- Coaching various sports and games.
- Organizing various sports and games.

List of Practicals

- Yogasana
- Mudra
- Pranayama
- Track and field
- Cricket, Handball, Kho-Kho
- Intramurals
- Specialization

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