



PHYSICAL EDUCATION
PAPER NO. : B. P. Ed. 4-IV A4

Title:
Science of Sports Training
B. P. Ed. 4th Year

TOPIC NO. 2
Principles of Intensity and Volume of Stimulus

Lecture – 175
Meaning, Types, Causes, Symptoms and Tackling
of
Over Load

Introduction

The principles of training load are the guiding factors that help the coach to implement an effective training program. Out of all the principles of sports training, the principle of training load and administering proper recovery is the most important. However any mistake in adherence to this principle leads to a decline in performance standard of the sportsperson and in extreme cases may lead to overload.

The principle of **intensity of stimulus** consists of the following points:

- There is no development if the intensity of stimulus is less than 30%.
- The intensity of stimulus should be such that the effect is visible on the heart and the circulatory system.
- Only high intensity of stimulus creates super compensation effect in a sportsperson.
- When training is done with high intensity of stimulus then the improvement of performance is very rapid but is less stable. Therefore, the training should be extensive in nature so that improvement comes steadily but remains more stable.

Next important point to be considered is the principle of **volume of stimulus** which consists of the following main principles:

- The dose of the stimulus of volume should be such that the sportsperson is able to perform to the best of his capacity in each of the training unit administered.
- The stimulus of volume of load should be such that the symptoms of tiredness are visible to the coach.
- The stimulus volume should be increased even after having trained for a prolonged period of time so as to bring about development in the performance or to maintain top performance.
- The volume of training and the frequency should be given in a balanced state.

The frequency of training varies depending on the training age of the sportsperson. With an increase in the training age of the sportsperson the frequency of training also increases gradually. The training frequency for a beginner shall be 3-5 training units per week, the training frequency for an advanced sportsperson ranges in between 6-8 training units per week whereas for a top level sportsperson the training unit shall range between 8-12 training units per week. Thus the frequency should be based on the training age and level of sports performance of the sportsperson.

Overload

The proper and calculated administration of training load is very essential for the improvement of the performance of the sportsperson. However, non-adherence to the principle of training load can have drastic effects on the physical, physiological, psychological and other aspects of performance of a sportsperson.

The normal development of training state of a sportsperson is disturbed when the physical and psychic daily load of life exceeds the loading capacity of the individual. Over loads, administered over a longer period of time lead to decreased performance capacity.

Modern sports scientists consider the over loading phenomenon as disturbance in normal nervous activity. Performance in sports is not only matter of muscular on metabolic efficiency but it mainly depends upon the efficiency of the nervous system. When nervous system is disturbed, the optimum utilization of energy and metabolic process also get disturbed. The other systems of the body are also unable to perform to the best of their efficiency.

It is necessary to provide progressive heightening of the stressor to oblige the body to seek a higher status of adaptation. Any improvement in fitness or performance requires an increased training load. That load is stimulated to which the athlete's body reacts. If the load is greater than normal, the body becomes fatigued and its fitness level fails. If optional the athlete will be more fit after recovery (over compensation). The causes of overload can be within training or outside training. The state of overload is not produced in a day or two, but is a slow process which takes days to crystalize. It is also accompanied by symptoms by which it can be recognized at early stage and remedial measures can be adapted. It has however discussed the causes, symptoms, forms and remedial measures for overload from the view point of exercise physiology. It is cleared that causes of overload are manifold and encompass the total life of the sportsman. Therefore earlier recognition and effective tackling of overload, coach must have as much information about the sportsman as possible. A close contact with the sportsman, a thorough knowledge about his living and working conditions, nutrition, family affairs,

health etc. are necessary pre-requisites for prevention as well as for treatment of overload.

Types

Over loading is of two types

1. Dominance of excitation process

The training plan should be prepared in accordance with the principles of sports training and should mirror the characteristics of it as well. The principle of steadily increasing the load has to be considered before increasing the training load. The load increases in a step by step manner and gradually in a systematic and scientific manner. Overloading due to the dominance of excitation process occurs when the training load is increased suddenly without adequate preparation, hence the sportsperson has to be prepared both physiologically as well as psychologically so as to avoid overload.

2. Dominance of relaxation process

Recovery or relaxation from the stress produced as a result of the load that has been administered is very essential for the sportsperson so that he is prepared to take another bout of load efficiently (depending on the motor component under consideration). If recovery or relaxation is less than required then there would be tension in the muscles which would lead to a decrease in efficiency of the sportsperson to undertake the load. On the other hand, if the recovery time or relaxation is given more than required, then the muscles of the body of the sportsperson will be unprepared to take another bout of load thus leading either to decrease in efficiency or even minor or major injury. Thus dominance of relaxation process results when the over dose of training load is administered continuously over a longer period of time with insufficient recovery.

Causes of over Loading

There are various causes that lead to overloading. They may be non-adherence to the principles of sports training either on the part of the coach in formulation of the training plan or on the part of the sportsperson in following the training plan that has been prepared for him meticulously. Thus, the main causes that lead to over loading can be discussed under the following four categories.

1. **Faulty Training method**

The training method adopted by the coach plays a vital role in bringing about improvement in performance, but the training method should be adopted depending on the chronological age, training age, physiological functioning, psychological factors and various other factors that affect performance of the sportsperson. Few of the points that cause overload are:

- a. Neglect of recovery process
- b. Rapid increase in the training load thus adaptation does not take place.

- c. High volume of load with maximum or sub-maximum intensity.
- d. Forced technical training involving, complicated movements without adequate rest.
- e. Too many competitions with high demands with frequent disturbance of daily routine.
- f. Excessive one-sided training, frequent failures and defeats due to unrealistic aims of sports training.

2. Life Factors

The sportsperson needs to have a life that corresponds to the demands of the sports life. But there are 'n' numbers of factors in his personal life that mislead the sportsperson and lead to deviations in the sports life of the sportsperson that cause overload. Some of the factors that affect the training state of the sportsperson and cause overload are:

- a. Insufficient night rest
- b. Irregular daily routine
- c. Luxurious daily routine
- d. Excessive use of alcohols, nicotine, caffeine, intoxicants etc.
- e. Bad living conditions
- f. Insufficient leisure time and inability to utilize it properly.
- g. Quarrel in the family or the community.
- h. Improper nutrition, fast living.
- i. Frequent weight making e.g. wrestlers.

3. Social Factors

It is an inevitable fact that everyone had a social life as well and has to gel well with the members of the society so that the social development of the sportsperson takes place simultaneously. But at times the social life of the sportsperson comes in the way of training and hampers the training process to a huge extent. Some of the factors of the social life of a sportsperson that lead to hindrance of training plan either physiologically, psychologically or socially are:

- a. Excess of engagements
- b. Friction in the family
- c. Unsatisfied profession or studies
- d. Strained relations with colleagues and friends
- e. Over loading in professional work, studies etc.
- f. An unfriendly family towards sports
- g. Excess of entertainment programs

4. Health Factors

'A healthy body houses a sound mind' and a sound mind is one which can get involved in strenuous activities. In order for a sportsperson to give his best in the training program, a positive health is very essential. The coach should never

neglect the health of a sportsperson and even minor ailments should not be neglected. Health issues like:

- a. Fever
- b. Cold
- c. Coughs
- d. Digestive problems
- e. Bad stomach
- f. Infectious disease
- g. Injuries

If avoided can prove perilous for the sportsperson.

Symptoms of Over load

During the training process, on administration of outer load, inner load results and is visible to the coach. But the coach should be very observant that the outcome is a result of calculated load and not a result of administration of overload.

The overload is a state of psychological and physiological deterioration resulting in decrease in performance capacity. This deterioration is characterized by various symptoms which, like other diseases, are of great help in recognizing the state of overload. These symptoms can be divided into three groups, viz. psychological, performance and somatic-functional symptoms. The psychological symptoms are the first to occur followed by performance symptoms and then lastly, the somatic functional symptoms. This is the general sequence of occurrence of symptoms which in certain cases may be different. The different symptoms also usually overlap each other.

As psychological symptoms are the first to occur, therefore, these are very important in order to recognise the overload at a very early stage and consequently, to tackle it. At this stage, the overload can be easily checked. The psychological symptoms can be the first or second type depending upon the personality of the sportsman. In very early stage, the symptoms are not much pronounced and the sportsman is able to control his behaviour before the coach during training, thus making the task of the coach more difficult. But later on, these symptoms become pronounced and the sportsman is unable to control his expression before the coach. An experienced and vigilant coach can now without mistake, recognise these as symptoms of overload. He can further confirm his judgment by asking about the behaviour of the concerned sportsman off the field, from his friends, family members etc. a close contact between the coach and his trainees as well as frequent meetings between the coach and parents or family members and other persons connected with the sportsman are of great help in this regard. A coach has dictatorial approach towards his trainees and does not bother to find out the various problems which the sportsman is facing, is usually late to recognise the state of overload. In case of overload, the later you recognise, the more harmful it is.

If the psychological symptoms are overlooked and nothing is done to tackle it, the state of the sportsman deteriorates further. Now one can clearly recognise the decrease in his performance capacity in task of strength, speed and endurance and his capacity to carry out competitions successfully. This is a stage in which every coach can clearly see that something has gone wrong. If still something is not done, then the third type of symptoms occur which signify a highly advanced stage of overload. When this happens, the sportsman and the coach are forced to stop the training and to go to the medical

expert for advice and treatment. All this will result in a long break in the training activity which will markedly reduce the chances of winning a competition for which the sportsman was preparing. Therefore, it must be accepted as a principle that the state of overload should be recognized and tackled as early as possible to save the sportsman from further suffering as well as to enable him to achieve the aim of the training.

The symptoms of over load are grouped as follows and they also appeared in the same order:

1. Psychological symptoms

- a. Increased excitability: Increased in capability of readily roused into action or a state of excitement or irritability.
- b. Tendency towards hysteria: The emotions such as fear, anger etc. are gradually increased as a result of overload.
- c. Quarrelsome: A sports person tends to join in argument or in fight over a small issue.
- d. Less contact with the coach and colleagues.
- e. Increased sensitivity towards criticism and gives negative response to it.
- f. Depression: Depression is a serious medical condition in which a person feels very sad, hopeless, and unimportant and often is unable to live in a normal way.
- g. Indifferent: Not interested in or concerned about something.
- h. Uneasiness: He feels awkward and uncomfortable.
- i. Not at peace with himself.
- j. Melancholy: a feeling or showing sadness.
- k. Loss of confidence.
- l. Loss of motivation.

2. Performance symptoms:

- a. Increased error in technique.
- b. Decreased concentration and correction ability.
- c. Decreased differentiation ability correction ability.
- d. Decrease in strength, speed and endurance abilities
- e. Slow recovery process
- f. Decreased competition readiness
- g. Decreased competition qualities
- h. Error in movement rhythm and flow
- i. Increased tendency to surrender in competition
- j. Uncontrolled behaviour in competition (loss of poise and self-control)
- k. Fear of inability to face difficult situations particularly at finish.
- l. Decrease in conditional abilities
- m. Deviation from one's strategy,
- n. Increased disposition in demoralizing influences before and during competitions

3. Somatic-Functional symptoms
 - a. Loss of sleep
 - b. Loss of appetite
 - c. Loss of weight
 - d. Disturbance in digestion
 - e. Frequent giddiness
 - f. Susceptibility to injuries and infections
 - g. Sweating easily
 - h. Decreased vital capacity
 - i. Lengthened pulse recovery

Tackling Over Load (Remedies)

Tackling of over load is not an easy task. The coach, sportsperson, sports doctor and sports psychologist should work together to tackle this serious problem. The coach should know the total load on the sportsman and should properly coordinate the training load with other types of loads. For the prevention and tackling of overload, the following hints are given:

1. The coach should recognize the state of over loading as early as possible by carefully observing the sportsperson during each training session. The coach should look for the psychological symptoms because they are the first to appear.
2. As soon as the coach is convinced that there are signs of over loading, the following four things should be done:
 - a. The training loads should be considerably reduced.
 - b. Additional means i.e. good diet, physiotherapy, massage and general exercise should be adapted to accelerate recovery.
 - c. Guidance of sports doctor, or if necessary, a sports psychologist, should be consulted. If necessary, the sportsman must be medically examined.
 - d. Meeting with parents or family members and other important persons connected with the sportsman should be arranged.
3. When there is overload, competitions and trials should be avoided.
4. The coach, with the help of friends, colleagues, parents, sports doctor and sports psychologist should make sincere effort to find out the real causes of over loading.
5. The cause or causes of overload should be removed. The training should be modified to make it more suitable for the sportsman. Sometimes, when the cause of over load lies outside training, the coach has to do some organizational work to solve academic, professional and family problems of the sportsman. If it is possible, the coach should come forward to tackle these problems in cooperation with the sportsman and other related persons.
6. Finally, the training should be started again according to the revised training plan. It should start with less load, and slowly and carefully. The load should be increased and brought to the previous level.

Conclusion

Overload when given to a sportsperson over a prolonged period of time can lead to decrease in the performance capacity of the sportsperson. Modern day scientists consider the overloading phenomenon as disturbance in the normal nervous activity. The performance of a sportsperson in a given situation is not just the outcome of metabolic processes taking place within him but also an outcome of the interaction of impulses that are transferred within the neurons that comprises the nervous system. The proper and efficient functioning of the nervous system is also responsible for achievement of optimum performance. When the functioning of the nervous system is disturbed or disrupted, the optimum function of all the other systems gets disturbed ultimately resulting in a decline of sports performance or even lead to minor or major injuries further delaying as well as lengthening the training process of the sportsperson. Thus, overloading should be avoided and calculated bouts of load and recovery in accordance to the load should be administered to ensure the required amount of recovery. The causes of overload can be within training or outside training. The state of overload is not produced in a day or two, but is a slow process which takes days to crystalize. It is also accompanied by symptoms by which it can be recognized at early stage and remedial measures can be adapted.