

National Conference

on

**Interdisciplinary National Conference on Role
Of Physical Education and Other Disciplines in
Enhancing the Performance of a Player &
Fitness for Young and New India**

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Sr No	Name of Authors	Title of Paper	Page No.
1.	Dr. Seema v. Deshmukh Smt. S.R. Mohata Mahila	Yoga Through In Personality Development Of Children & Young	1 To 3
2.	Manisha Narayan Punde Dr. Chatrapati Bahurao Vairagar(Pungarkar)	A Prospective Study of the Impact of Stress, Anxiety On Sports Performance and Quality of Life	4 To 7
3.	Punam Narendra Mahalle	A Role Of Yoga In Education	8 To 9
4.	Abdul Amar	The Role Of An Omega 3 (EPA - DHA) To Enhancing The Mental Health Of An Athlete	10 To 11
5.	Dr. Khushal Jagtrao Alaspure	Comparative Study of Fat Percentage and Lean body Weight among Vegetarian and Non-Vegetarian Students	12 To 14
6.	Dr. Madhav shejul	Advance Sports Technology	15 To 16
7.	Dr. S. N Chougule Dr. Sandeep Shinde	The Role Of Technology In Sports	17 To 19
8.	Dr. Umesh Rathi	The Importance of Outdoor Play and Its Impact on Brain Development of Children	20 To 21
9.	Dr. Altaf ur Rehman	Music Fuel For Performance In Sports	22 To 23
10.	Madhavi Mardikar Bharti Kale	Physical Education Teacher's approach towards Professional Sports Management	24 To 27
11.	Amol H. Bichewar Dr. Tanuja S. Raut	Leisure Activity For Contemporary Age Group	28 To 31
12.	Dr. Rajesh D. Chandrawanshi	Application of Advanced Technology to enhance the performance of Wrestlers	32 To 34
13.	Bhagyashri S Vidhale	Conceptual Application Of Statistical Methods And Techniques In Physical Education And Sports	35 To 36
14.	Dr. Manoj P. Armarkar	Increasing self defence level for women empowering through martial arts and yoga	37 To 39
15.	Dr. Sunita S. Balapure	Role Of Nutrition & Dietetics For Player & Fitness	40 To 42
16.	Dr. Balasaheb Paul	Role of coach in achieving Athlete's Peak Performance	43 To 45
17.	Dr. Ashwani Bali Mr. Harinder Pal Singh	Study Of Aggressive Tendency Between Individual And Team Game Players	46 To 48
18.	Dr. Pravin D. Lamkhade	Boosting Hydration in Sports	49 To 50
19.	Mrs. Rachana M. Sirsat	Calcium And Bone Health	51 To 54
20.	Chandrashekhar Surendra Ingole	Comparative Study Of Motor Abilities Between Tribal And Non-Tribal Sports-Persons	55 To 57
21.	Prof. Prashant Sushakar Rao Charjan	Impact of Kapalbhari and Pranayama on Vital Capacity among Obese Boys	58 To 60

Role Of Nutrition & Dietetics For Player & Fitness

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"Eat healthy, be wealthy"

Food is the basic necessity of life. In Ayurveda, we find instructions regarding the appropriate choice of food for quick recovery as well as for preventing further diseases and complication. Nutrition for sports is a discipline which applies principles derived not only from nutritional, but also biochemical and physiologic scientific knowledge for the purpose of promoting optimal performance while remaining healthy. The body's ability to deliver and utilize oxygen in sufficient quantities to meet the demands of increasing levels of exercise is called fitness. People who exercise have increased muscle strength due to hypertrophy then due to hyperplasia. The human body must continuously be supplied with energy to perform its many complex functions. Two metabolic systems supply energy for the body—one dependant on oxygen (aerobic metabolism) and the other able to function without oxygen (anaerobic metabolism). Both of these systems provide energy, however, the use of one system over the other depends on the duration, intensity and type of physical activity.

Objectives Of The Study :-

- 1) What is nutrition and dietetics
- 2) To study the Nutritional Requirement for sports.
- 3) To study the Food Requirement for sports.
- 4) To provide adequate nutrients in terms of energy, protein, vitamins and minerals according to the individual needs.
- 5) To suggest Dietary Guidelines.

Nutrition And Dietetics :-

As defined earlier, nutrition is the science of food and its interaction with an organism to promote and maintain health. Food is the substance taken into the body that will help meet the body's need for energy, maintenance of health.

Optimum Nutrition means that the person is receiving and utilizing essential nutrients in proper proportions as required by the body while also providing a reserve.

Dietetics is the branch of therapeutics which puts into practice the application of the principles of nutrition to diet in related to health.

The American Dietetics Association defines dietetics as "a profession in which there is a integration and application of principles derived from the science of food, nutrition, management, communication, biological, physiological, behavioral and social sciences to achieve and maintain optimal human health."

Nutritional Requirements :-

An athlete's energy and nutrient requirement vary with weight, height, age, sex and metabolic rate. Emotional and physical stress of training and competition, combined with hectic travel schedules affect dietary intake, adequate caloric and essential nutrient intake must be planned carefully to meet requirements for training and fitness.

Energy :-

Even for the athlete, there is no significantly greater need for protein or fat than for a nonactive person. Carbohydrate is the fuel of preference and the critical food stuff for the active person. This carbohydrate should be complex in a form at an intake that will not only meet increased energy needs but also supply added vitamins and minerals.

Carbohydrate :-

Major nutrient for energy support in exercise is carbohydrate. Carbohydrate should contribute to 55% or more of the daily caloric intake. Complex carbohydrates are preferable to simple ones. They take longer to digest, provide a more sustained source of blood glucose, and are metabolized preferentially into glycogen. Simple sugars on the other hand are less efficient to maintain the body's glycogen stores. They are mainly converted to fatty acids stored as fat rather than as glycogen. Simple

carbohydrates also provoke a sharper insulin response, contributing to the dangers of subsequent hypoglycemia. In addition, complex carbohydrates supply needed fibre, vitamins and minerals.

Protein :-

Protein requirements of athletes, particularly those engaged in strength and power events may be increased above those of sedentary people for the following reasons :

- Amino acids are used to repair muscle trauma that results from repeated muscle contractions and for the repairs to injuries to muscle fibres. Due to this protein requirements are increased.
- To remodel muscle tissue in response to strength training. There is an increase in muscle bulk due to resistance training. Protein requirements of the beginner strength athletes to maintain nitrogen balance appear to be at the higher end of the range compared to that of elite strength athletes. Research shows that those who are adopted to strength training may not need a very high intake of protein.
- Prolonged exercise increases oxidation of amino acids for fuel. Protein use as an energy substrate increases during high intensity, long duration endurance activity. Protein makes a greater contribution to total energy production during endurance exercise when muscle glycogen levels are low.

Protein intake equal to 15-20 per cent of total calories will meet the protein requirements of most athletes. No protein supplementation above this level required for any kind of sport. Consuming more protein than 2.0g/kg body weight results in increased protein oxidation, uric acid formation, diuresis and can increase risk for dehydration.

Fat

In the presence of O₂, beta-oxidation of fatty acids provides acetyl groups to feed into the energy producing citric acid cycle. The rate at which this can take place is determined in part by the rate of mobilization of fatty acids from storage. Free fatty acids are stored with glycerol as triglycerides in the body's adipose tissue. The enzyme lipoprotein lipase mobilizes these stores of fatty acids. This lipase is stimulated by exercise. Its activity is affected by levels of hormones also implicated in exercise, especially growth hormone and epinephrine.

It is important to recognize fat as a substrate is not exogenous from the diet directly but endogenous from body fat stores. Dietary fat is not necessary to maintain fat stores, since excess kilocalories will be stored as fat regardless of their dietary source. It is important to have some fat in the diet, especially a source of the essential fatty acid, linoleic acid. Since the heart muscle prefers fatty acids especially linoleic acid, as an energy source. Compulsive runners who have virtually eliminated fat from their diets have linoleic acid deficiency, death may result from cardiac arrest in some cases. Although it is necessary to include some fat in the diet, the total amount should not exceed 20-25 per cent of the total daily kilo caloric intake.

Vitamins And Minerals -

Increased exercise levels are not correlated with increased dietary needs for vitamins or minerals, with the possible exception of riboflavin. In general, exercise may well increase the body's efficient use of vitamins and minerals. Therapeutic iron supplements may be necessary for some athletes who experience "Sports anaemia"

Owing to increased energy requirements and exercise induced production of free radicals, higher amounts of B-vitamins and vitamins with anti-oxidant properties are required for athletes. The B-vitamin requirement is 1 mg / 1000 kcal for thiamine and riboflavin and 10-20 mg / 1000 kcal for niacin. B complex deficiency can lead to fatigue, muscle soreness, apathy and loss of cognitive function. Intake of retinol may be placed at 1000-2000 micrograms per day. Vitamin E, which is an antioxidant should be taken at the level of 1020 IU. Vitamin C, which is also essential for iron absorption, intake should be 100-200 mg / day.

There is an increased risk of stress fracture among athletes which is associated with lower calcium intake and lower bone density. Female athletes should have an adequate supply of calcium to avoid calcium loss from bones. The calcium intake of 1-2 g per day is recommended. Dairy products, especially low - fat choices are the best sources of calcium.

Consuming adequate amounts of iron is essential for an optimal aerobic endurance performance especially for the female athletes and athletes between 13 and 19 year of age. Female athletes, who train heavily, have a high incidence of amenorrhoea and thus conserve iron stores. In any case, iron intake should not be less than 50-75 mg for sports men and 60-100 mg for sports women.

Food Requirements :-

When exercise begins, insulin release is suppressed, and catecholamine secretion is increased. Carbohydrate feedings during intermittent exercise such as soccer or basketball have also been shown to be beneficial. The recommendation is to take in approximately 30-60 g of carbohydrates each hour, beginning early in the exercise. This can be accomplished at the same time as fluid replenishment. As for pre-exercise conditions, fructose ingestion (as the only carbohydrate source) during exercise has been associated with gastrointestinal distress and is not associated with performance improvement.

Meal Pattern Before, During And After The Event

Before the event

- Eat 2-4 hours before the event small comfortable amount.
- High in carbohydrate and fluids
- Low in fat, fibre and gas producing foods
- Within 15 min before a long event, the athlete should drink 100-200 ml of water or fluid.

During the event

- Drink only fluids
- If the event is all day, high carbohydrate, low fat foods are taken

After the event

- Plenty of carbohydrate
- Lot of fluid, sports drinks or juices
- Easy to digest

Follow Dietary Guidelines :-

There is no miracle food or supplement that can supply all nutritional needs.

Dietary Guidelines :-

- 1) Follow the advise of your physician, nutritionist and coach.
- 2) An adequate, balanced diet is necessary for an effective performance but does not guarantee it because nutrition is but one aspect of performance.
- 3) Ingestion of one or more nutrients in amounts much greater than body needs will not enhance performance.
- 4) Loss of water in sweat is accompanied by a very small loss of salt relative to the amount in blood. Hence additional salt tablets need not be taken.
- 5) The best way to prevent dehydration is to drink water before, during and after exercise.
- 6) Exercising immediately after a meal could lead to nausea, vomiting, distension and cramping.
- 7) A rapidly digested meal low in fat, moderately low in protein and high in complex carbohydrate should be eaten 3 to 5 hours before the competition.
- 8) Coffee, tea, beer and caffeine containing soft drinks should be avoided. The increased carbon-dioxide levels in the digestive tract after taking carbonated beverages reduce the body's urge to take additional fluids. Soft drinks provide only empty calories.

Conclusion :-

- Dietetics is a science that deal with the adequacy of diets during normal life cycle.
- Besides proper training, motivation and determination, a good judicious diet is all that is needed to excel in active sports.
- They also provides adequate amounts of proteins, carbohydrates, fats and specially vitamins and minerals to meet their requirements.
- Follow Dietary Guidelines there is no miracle food or supplement that can supply all nutritional needs.

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