CHAPTER I

INTRODUCTION

1.1 Preamble

Wrestling is one of the ancient sports events. Sports and games are essential components of human resource development, helping to promote good health, comradeship and spirit of healthy competition, which in turn has positive and deep impact on the holistic development of personality of the youth a potential source of energy, enthusiasm and inspiration for development, progress and prosperity of the nation.

Excellence in sports enhances the sense of achievement, national pride and patriotism. Sports being practical way of education, it facilitates beneficial recreation, improves productivity, and fosters social harmony including sense of discipline and dedication in general life. Sports give a strong message of peace, friendship and understanding among the people of participating nations. Today, sports are a prime need for a civilized society, as it helps to promote national integration, emotional integrity and professional intellect of the athletes.

Participants get ample opportunities to meet each other for a couple of days during competitions, wherein a great deal of creative energy is created, resulting in numerous concrete ideas for developing top class human resources and canalizing youthful energy into constructive directions. Sportsman spirit practiced during the play help one to lead the way out of gloom into light and life full of joy.

Wrestling is defined as "a sport or contest in which two unarmed individuals struggle hand to hand with each attempting to subdue or unbalance the other," (Mish, 2001)[1]. Wrestling is an ideal sport to prepare men for combat duty. Wrestling is a Sport in which two competitors grapple with and strive to trip or throw each other down or off-balance. Wrestling is the best sport for a complete mental and physical development. Wrestling makes you active, immune, strong and smart. The exercises and bouts help in building strong muscles and increases bone density, while the body-throws and locks to counter your opponent increase your cognitive skills and intellectual ability. Further, Wrestling is a sport with defined weight classes that require the athlete to have strict control over his/her competition weight. Wrestlers choose a weight class that would best fit their skill level and allow the wrestler to be competitive at the beginning of the season, often 10 to 15 pounds lighter than their off-season weight (H.J., 1998)[2]. An athlete's summer weight is associated with the natural body weight that occurs during the summer off-season period because the influences of weight management training are not present.

To maintain the desired physical condition demanded from this sport, many athletes consistently participate in training. There are multiple styles of wrestling with overlapping competitive seasons, which allow athletes to maintain a level of training throughout the year. Some areas of focus for training include aspects of technique, endurance, and weight management. Training sessions can result from team or club practices, individual workouts, specialty clinics, and specific training camps. Most training camps occur during the summer months and last

[1] F. Mish, (Ed.). Merriam-Webster's collegiate dictionary (10th ed.).Massachusetts: Merriam-Webster, Inc. 2001.

[2] H., J. (1998). Wrestling hyperthermia and dehydration. Canadian Medical Association Journal, 158, p.1171.

between a couple days and a few weeks. However, to maintain the specific weight and endurance it is important to follow strict diet. Technique and stamina are also important factors to winning because close matches are usually won or lost during the final seconds in a flurry of several explosive offensive and defensive maneuvers. Wrestlers must be able to perform at a high level of fatigue. In order to get into optimal physical condition, wrestlers need to train hard in preparation for the next match. In order to get the most out of the training, athletes must eat properly. Nevertheless, wrestlers are kept on proper diet for maintaining optimum weight and health; however, it is imperative to find out whether the wrestlers have proper scientific knowledge of nutrition practices. Perceiving this aspect the researcher sought to determine the knowledge of nutrition and practices among wrestlers.

1.2 Brief about Wrestling

Wrestling is practiced in various styles; it has an equal value for any young man in developing his physical powers and extensive psychological benefits, which can be derived from competition in this fine art of sport. Owing to rigorous nature, it not only provides a fine mental tonic towards development of an aggressive attitude, but it is unexcelled as a means of acquiring physical efficiency, co-ordination, poise and effective use of the body. After a man has learned how to pin his opponent's shoulder to the mat, the "Winning Spirit" invades his mind and he realizes that he "Can take care of himself" in any sort of physical encounter. The meaning of Wrestling in simple words is as follows:

W- Work Hard;

R- Reaction Ability;

E- Elasticity, Endurance;

S– Strength, Speed, Self control, Strategy;

T- Technique, Tactics;

L- Loyalty;

I- Intelligence;

N- Nutrition;

G- Good Coach

1.2.1 Historical Background of Wrestling

Wrestling is as old as the man itself. It is the king of all sports. In past it was needed to fight against the wild animals that were also wrestling. People play wrestling since ancient period. Wrestling is one of the oldest forms of combat on which we have many well documented records. Even before the historic era, Stone Age man had developed a form of wrestling, which bordered on the scientific lines. Stone Age man had to strengthen himself for physical combat. Wrestling at that time was not only the primary type of war face among men but also extended to clashes between men and beasts. In that age wrestling was significantly a brutal activity.

At that time wrestling was very brutal without any specific rules. There was no time limit. Wrestlers used to fight against each other till either of them died. But after some period, people started to look at wrestling as a game. It started to play under some rules and wrestling achieved great popularity.

Since 1921, the International Federation of Associated Wrestling Styles (FILA), which has its headquarters near Lausanne, Switzerland, has set the "Rules of the Game", with regulations for scoring and procedures that govern tournaments such as the World Games and the competition at Olympics.

Today, there are specific rules and time limit in wrestling. All wrestle under the same rules and regulation in the competition, but besides the style used in Olympic Games, every country has its own national style. There are two types of wrestling which are played in Olympic Games. 'Freestyle' & 'Greco- Roman.' There are different rules for each style. In India there is one more type of wrestling that is 'Indian Wrestling Style' [Mud Wrestling].

1.2.2 Types of Wrestling

Freestyle:

In this wrestling style contestants can use, holds above and below the waist. Freestyle wrestling is a style of amateur wrestling that is practiced throughout the world. Along with Greco-Roman, it is one of the two styles of wrestling contested in the Olympic Games. Freestyle wrestling has been in the Olympic Games since the 1904 Olympics in Saint Louis, Missouri.

Greco- Roman:

Greco-Roman is an international discipline and an Olympic sport, which allows only holds above the waist. "In this style, it is forbidden to hold the opponent below the waist, to make trips, and to actively use the legs in the execution of any action."

1.2.3 Wrestling in India

Considered as one of the most ancient and oldest sports in the world, wrestling in India has glorious past. Wrestling is purely an Indian exercise. In India it is mentioned in the famous Indian epic 'Ramayana' & 'Mahabharata.' Wrestling in India is most famously known as Malla-Yuddha., Mahabharata has a huge mention about the game of Wrestling. One of the premier characters in

Mahabharata, Bhima was considered to be a great Wrestler of that time and some of the other great wrestlers included Jarasandha, Duryodhan, Karna etc. There are some examples of wrestling bouts of Bhima-Jarasandha, Krishna-Jambuwanta etc. In the other Indian epic, Ramayana also mentions about Wrestling in India and Hanuman is described as one of the greatest wrestlers of that time.

In the ancient times; Wrestling in India was mainly used as a wonderful way to stay physically fit. It was also used as a great way of military exercise without any weapons.

There were four types of wrestling in Ancient India

Hanumanti Wrestling:

The holds full of tricks and tactics used by Hanuman such as leg hold and throw, cross buttock, leg hook and throw, arm and leg throw. The technical superiority of the Wrestler matters the most in the Hanumanthi type of Wrestling. The wrestler can get victory over the opponent of even greater strength, by his technical superiority.

Bheemseni wrestling:

The type of holds requiring strength and power used by Bheemsen, such as lifting the opponent above the shoulder level and throwing him down, waist back press, neck press etc. This type of wrestling is for those wrestlers, who have huge build and strength. This form of Wrestling gives pressure on acquiring the strength and then using it.

Jamuwanti Wrestling:

The holds full of locks. In this Wrestling, the wrestlers apply locks and holds to get control over the opponent.

Jarasandhi Wrestling:

The Jarasandhi form of Wrestling is mainly focused on the breaking of the limbs and joints of the opponent and hence, it is considered as the most dangerous form of Wrestling in India.

Limb breaking holds used by **Jarasandhi**, included shoulder lock with flying mare, hand pull and wrist lock on the back, shoulder hold and wrist breaking etc. Generally, untrained and unskilled villagers who have enough strength usually make full use of **Bhimseni** Wrestling, where as **Hanumanti** Wrestling has an advantage to beat even a stronger opponent by applying tricks and skilled holds. In **Jamuwanti** Wrestling by use of locks, a wrestler is able to bring his opponent under his control and can make him feel exhausted. And in Jarasandhi Wrestling by means of limb breaking holds a wrestler can harm the opponent (Majumdar 1950)[3].

Wrestling in India, during the ancient times, used to get regular patronage from the Emperors and Kings. The kings of pre-independence nurtured Wrestling in India to a large extent. The Indian Kings used to keep the wrestlers in good diet and provide them with pulses, meat, milk, Ghee, sugar and high quality foods. The wrestlers used to keep themselves engaged inside the wrestling court and concentrate on bodybuilding, all the time. The Indian Kings had many stables and `court` wrestlers, who represented them against the wrestlers of their rival Kings. During the British rule, Wrestling in India got another big push, as the British rulers included the game into the military practice. The British military including Indian soldiers got attracted to wrestling, very much.

Wrestling in India continued to increase its popularity till the modern days and India was considered among the top 10 countries in Wrestling till the 1960s.

[3] Majumdar, D.C. Encyclopedia of Indian Culture, Good Companions, Baroda, India, 1950.

India reached its peak of glory in the IV Asian Games (later on called Jakarta Games) in 1962 when all the seven wrestlers were placed on the medal list and in between them they won 12 medals in freestyle wrestling and Greco-Roman wrestling.

A repetition of this performance was witnessed again when all the 8 wrestlers sent to the Commonwealth Games held at Kingston, Jamaica had the distinction of getting medals for the country. During the 60's, India was ranked among the first ten wrestling nations of the world and hosted the world wrestling championships in New Delhi in 1967.

In India the wrestlers are called as `Pehelwan. The Indian wrestlers used to compete in the wrestling competitions and practice in a 20x20 deep stone courtyard full of clay and water or milk. However, in the modern times, wrestling mats have replaced them.

Wrestling in India has witnessed the rising of several eminent wrestlers, so far. The renowned Indian freestyle wrestler, Khashaba Dadasaheb Jadav won bronze medal in the 1952 Helsinki Olympic Games. Before this he was participated in the 1948 London Olympics and won fourth place.

Apart from them, in the recent years, Wrestling in India is watching the rising of some wrestlers, who have a high potential to revive the dominance of India in the international Wrestling arena. The famous Indian wrestler, Sushil Kumar has won Bronze medal in the 2008 Beijing Olympic Games, Gold Medal in 2010 World Championship at Moscow, Russia; Gold Medal in Delhi Commonwealth games 2010.

Wrestling in India is being run and managed by a number of associations at the state and national level. The national body for Wrestling in India, the wrestling

Federation of India (WFI) came into existence in 1967 and it has been promoting the game in India, since then. Apart from that, there is also several state level wrestling associations that are working in collaboration with the WFI for the management of Wrestling in India. The associations present many awards and Wrestling titles to the Indian wrestlers. Some of the most prestigious Wrestling titles include the 'Rustam-E-Hind' that means Wrestling Champion of India, and the 'Mahan Bharat-Kesri' that is given to the Best Heavyweight Wrestler of India. Indians have made it a science as there are so many tricks and counter tricks in this exercise. Any off hand attack from an opponent can be identified, if we have mastered these skills. Every generation in India seems to have produced best wrestlers. Gama and others were declared as world victors in wrestling. Satpal, Karta, Master Chandgiram, Rakesh kumar Mukesh Khatri etc.

1.2.4 Scenario of Wrestling in Maharashtra

Wresting is a very popular sport of Maharashtra. Even in the era of cricket, it has maintained its popularity, especially in the rural regions of Maharashtra. Sangli Satara & Kolhapur district is well-known for wrestling. Khashaba Jadhav was a famous wrestler from Maharashtra. He was the first Indian of independent India to win Olympic medal in an individual sport. He won a bronze medal in the 1952 Helisinki Olympics. Maharashtra has produced a number of eminent wrestlers of international and national statures like Ganapat Andalkar, Mariti Mane, Kaka Pawar. ***The following table will explain the contribution of wrestlers from Maharashtra in wrestling championships:***

The Wrestlers of Maharashtra Kesari
Award Winners

Sr. No.	NAME OF THE WRESTLERS	DISRICT	PLACE	YEAR OF AWARD
1	Dinkar Dahyari	Kolhapur	Aurangabad	1961
2	Bhagwan More	Sangali	Dhule	1962
3	Ganpat Khedkar	Kolhapur	Amravati	1964
4	Ganpat Khedkar	Kolhapur	Nasik	1965
5	Dinanath Sinh	Mumbai	Jalgaon	1966
6	Chanba Mutnal	Kolhapur	Khargaon	1967
7	Chanba Mutnal	Kolhapur	Ahamadnagar	1968
8	Harishchandra Birajdar	Usmanabad	Latur	1969
9	Dadu Chaugule	Kolhapur	Pune	1970
10	Dadu Chaugule	Kolhapur	Alibag	1971
11	Laxman Vadar	Kolhapur	Kolhapur	1972
12	Laxman Vadar	Kolhapur	Akola	1973
13	Yuraj Patil	Kolhapur	Thane	1974
14	Raghunath Pawar	Pune	Chandrapur	1975
15	Hiraman Bankar	Pune	Akluj	1976
16	Annasaheb Kadam	Sangali	Mumbai	1978
17	Shivaji Pachpute	Mumbai	Nasik	1979
18	Ismail Shaik	Solapur	Khopoli	1980
19	Bapu Lokhande	Satara	Nagpur	1981
20	Sambhaji Patil	Kolhapur	Beed	1982

The Wrestlers of Maharashtra Kesari Award Winners (Contd.)

Sr. No.	NAME OF THE WRESTLERS	DISRICT	PLACE	YEAR OF AWARD
21	Sardar Khushhal	Kolhapur	Pune	1983
22	Namdeo Mole	Kolhapur	Sangli	1984
23	Vishnu Joshilkar	Kolhapur	Pimpri	1985
24	Gulab Barde	Ahamadnagar	Solapur	1986
25	Tanaji Bankar	Solapur	Nagpur	1987
26	Ravsaheb Magar	Solapur	Ahamadnagar	1988
27	Appala Shaik	Kolhapur	Pune	1992
28	Udayraj Yadav	Mumbai	Pune	1993
29	Sanjay Patil	Satara	Akola	1994
30	Shivaji Kekan	Beed	Nasik	1995
31	Ashok Shirke	Ahemadnagar	Vardha	1997
32	Gorakh Sarak	Satara	Nagpur	1998
33	Dhanaji Fadtare	Satara	Pune	1999
34	Vinod Chaugule	Kolhapur	Khamgaon	2000
35	Rahul Kalbhor	Pune	Nanded	2001
36	Munnalal Shaik	Solapur	Lalana	2002
37	Dutta Gaikwad	Pune	Yavatmal	2003
38	Chandrahas Nimgire	Solapur	New Mumbai	2004
39	Sayed Chaus	Beed	Indapur	2005
40	Amol Buchade	Mumbai	Baramati	2006
41	Chandrahar Patil	Sangli	Aurangabad	2007
42	Chandrahar Patil	Sangli	Aurangabad	2008
43	Vijay Bankar	Pune	Pune	2009
44	Samadhan Ghodake	Solapur	Roha, Raigad	2010
45	Narsing Yadav	Mumbai	Akluj	2011

The Wrestlers of Shiv Chhatrapati Award Winner

Sr. No	NAME OF WRESTLERS	DISTRICT	YEAR OF AWARD
1.	Chanba Mutnal	Kolhapur	1969-70
2.	Harishchandra Birajdar	Osmanabad	1970-71
3.	Dadu Chaugule	Kolhapur	1971- 72
4.	Shamrao Sable	Mumbai	1972- 73
5.	Vasant Patil	Mumbai	1973-74
6.	Keshav Patil	Mumbai	1974-75
7	Raghunath Pawar	Pune	1975-76
8	Ranga Chavan	Mumbai	1976-77
9	Ramkrupal Rajbhar	Mumbai	1977-78
10	Shivaji Pachpute	Mumbai	1978-89
11	Parvat Kasture	Aurangabad	1989-80
12	Ramchandra Sarang	Kolhapur	1980-81
13	Sanpat Salunke	Mumbai	1981-82
14	Chainu Lokhande	Kalyan	1982-83
15	Maruti Naik	Mumbai	1983-84
16	Nasruddhin N aikwadi	Sangali	1984-85
17	Dilip Pawar	Mumbai	1985-86
18	Vishnu Joshilkar	Kolhapur	1986-87
19	Anand Shinde	Mumbai	1987-88
20	Kaka Pawar	Latur	1988-89

The Wrestlers of Shiv Chhatrapati Award Winner (Contd.)

Sr. No	NAME OF WRESTLERS	DISTRICT	YEAR OF AWARD
21.	Anand Gaikwad	Mumbai	1989-90
22.	Kailas Mohol	Pune	1990-91
23.	Ramesh Mane	Pune	1991-92
24.	Appalal Shaikh	Solapur	1992-93
25.	Sanjay Magar	Solapur	1993-94
26.	Sarjerao Patil	Solapur	1994-95
27.	Suresh Pawar	Mumbai	1995-96
28.	Namdeo Wadre	Mumbai	1996-97
29.	Prakash J adhav	Pune	1997 –98
30	Govind Pawar	Pune	1998-99
31.	Rahul Kalbhor	Pune	1999-2000
32.	Ravindra Patil	Kolhapur	2000-2001
33.	Dattatrey Gaikwad	Pune	2002-03
34.	Yogesh Dodke	Pune	2003-04
35.	Atul Patil	Solapur	2006-07
36.	Amol Kashid	Nagar	2006-07

The Wrestlers of Double Maharashtra Kesari Award Winner

Sr. No.	Year	Wrestler	Place
1.	1964-1965	Ganpat Khedkar	Amravati, Nashik
2.	1967-1968	Chamba Mutnal	Ahamadnagar
3.	1970-1971	Dadu Chaugule	Pune, Alibag
4.	1972-1973	Laxman Vadar	Kolhapur, Akola
5.	2007-2009	Chandrahar Patil	Sangli

The Wrestlers of Asian Game Gold & Silver Medal Winner

Sr. No.	Wrestler	Place
1.	Hindkesari Maruti Mane	1962 Jakarta Free Style (Gold) & Greeko Roman Style (Silver)
2.	Hindkesari Ganpat Andalkar	1962 Jakarta Free Style (Gold) & Greeko Roman Style (Gold)

The Wrestlers of Arjun Puraskar

Sr. No.	Wrestler	Year
1.	Hindkesari Ganpat Andalkar	1963
2.	Kaka Pawar	1999

The Wrestlers of Dhyanchand Puraskar

Sr. No.	Wrestler	Place
1.	Maruti Mane	Sangli
2.	Harishchandra Birajdar	Latur

The Wrestlers of Dodoji Kondadev Puraskar

Sr. No.	Wrestler	Place	Year
1.	Dinkar Suryawanshi	Sangli	1990-91
2.	Harishchandra Birajdar	Pune	1998-99
3.	Vishnupant Savarde-Patil	Sangli	2001-02
4.	Vilas Kathure	Pune	2004-05

1.3 Importance of Nutrition in Wrestling

Today there is time limit in wrestling. Therefore today's wrestling is very dynamic. There is very tough competition in wrestling. Therefore to achieve high performance and become successful in wrestling one must have the knowledge of those factors on which performance depends to large extent. There are so many factors and Nutrition is one of the most important factor on which performance depends to large extent. Nutrition is the science that deals with food and its uses by the body (Goswami 1996)[4]. All the living things, need food to live. Food supplies energy for every action we undertake from eating banana to running a race. Food also provide materials that our body needs to build up and repair its tissues and to regulate the function of its organs and systems.

Initially Nutrition, a science of food was limited to just prevention of deficiency disease and maintenance of general health. But as man started taking part in competitive sports; Nutrition has become an important component of success in sports performance. To keep our body cells functioning properly they must be supplied with proper amount of food having required chemicals in ratio of the food. The chemicals in food, which our body needs, are called nutrients. Nutrients are food components, which the body utilizes after breaking of food that we eat." The important nutrients are as follows:

1] Carbohydrates;

2] Fat;

3] Protein;

4] Vitamins;

5] Minerals;

6] Water.

[4] Shashikant Goswami *et al.*, "Nutrition for Sports ", Patiala: Netaji Subhash National Institute of Sports.1996, p.2

a) Carbohydrates

Carbohydrate is the most important nutrient in an athlete's diet. It is the most abundant organic compound and the chief source of energy. Carbohydrates are stored in muscles and liver as a form of glycogen and in blood as glucose. During physical activity first we get energy from carbohydrate. 65% of total calorie consumption should come in the form of carbohydrate. It is very important because only CHO provides fuel for C.N.S., it spares protein, it provides instant energy & it provides fibers.

Carbohydrate is arguably the most important source of energy for athletes. No matter what sport you play, carbs provide the energy that fuels muscle contractions. Once eaten, carbohydrates are breakdown into smaller sugars (glucose, fructose and galactose) that get absorbed and used as energy. Any glucose not needed right away gets stored in the muscles and the liver in the form of glycogen. Once these glycogen stores are filled up, any extra gets stored as fat.

Glycogen is the source of energy most often used for exercise. It is needed for any short, intense bouts of exercise from sprinting to weight lifting because it is immediately accessible. Glycogen also supplies energy during the first few minutes of any sport. During long, slow duration exercise, fat can help fuel activity, but glycogen is still needed to help breakdown the fat into something the muscles can use.

Adequate carbohydrate intake also helps prevent protein from being used as energy. If the body doesn't have enough carbohydrate, protein is broken down to make glucose for energy. Because the primary role of protein is as the building blocks for muscles, bone, skin, hair, and other tissues, relying on protein for

energy (by failing to take in adequate carbohydrate) can limit your ability to build and maintain tissues. Additionally, this stresses the kidneys because they have to work harder to eliminate the byproducts of this protein breakdown. Carbohydrate has other specific functions in the body including fueling the central nervous system (CNS) and brain.

How Carbohydrate Fuels Exercise

Carbohydrate stored as glycogen is an easily accessible source of energy for exercise. How long this energy supply lasts depends on the length and intensity of exercise and can range anywhere from 30 to 90 minutes or more. To avoid running out of energy during exercise, start with full glycogen stores, replenish them during exercise and refill them after exercise to be ready for the next workout.

Types of Carbohydrate

Carbohydrates are also divided into simple and complex forms. Simple sugars (carbs) are absorbed and converted to energy very quickly and provide a rapid source of energy. Fruit and energy drinks are a good source of simple carbohydrates. Complex carbohydrates take a bit longer to be digested and absorbed into the body. They also take longer to breakdown and therefore provide energy at a slower rate than simple sugars. Examples of complex carbohydrates are breads, rice and pasta. Starch and fiber are also considered complex carbohydrates but fiber can not be digested or used for energy. Starch is probably the most important energy source in an athlete's diet because it is broken down and stored as glycogen. Foods high in starch include whole grain breads, cereals, pasta, and grains.

Carbohydrates are classified according to the number of saccharide (sugar) group present:

Monosaccharide e.g. Glucose, Fructose, Glactose.

Disaccharide e.g. Sucrose (sugar), Maltose, lactose.

Polysaccharide- more than two CHO units e. g. – Starch, glycogen, cellulose etc.

Some common sources and percentage of carbohydrate.

Food	Percentage(100gm)
Sugar	99.4
Rice	78.2
Wheat Flour	69.4
Green gram	66.7
Red gram	57.6
Carrots	10.6

B] Fat

Dietary fat is often blamed for many health problems; however fat is an important component of diet and serves a number of functions in the body. They are also sometimes known as lipids which include fat, fat like substances & oil etc.

Types of Fat:

a)Visible:

Visible fats are those fats derived from: Animal fat like butter, ghee, Vegetable fat like oils etc.

b)Invisible:

Invisible fats are that type of fat which are present in food like cereal pulses, milk & egg etc.

There are some other types of fat:

a)Saturated Fat:

Saturated fats are found primarily in animal sources like meat, egg yolks, yogurt, cheese, butter, milk. This type of fat is often solid at room temperature. Too much saturated fat has been linked to health problems such as high cholesterol and heart disease. Because of this, saturated fat should be limited to no more than 10% of total daily calorie intake.

b)Unsaturated Fat:

Unsaturated fats include monounsaturated and polyunsaturated fats, which are typically found in plant food sources and are usually liquid at room temperature. Unsaturated fats have health benefits such as lowering cholesterol and reducing the risk of heart disease. Common food sources include olive and canola oil, avocados, fish, almonds, soybeans and flaxseed.

c)Trans Fat:

Trans fat has recently been added to the nutrition labels of most products. Trans fatty acids are created (naturally or man-made) when an unsaturated fat is made into a solid. Trans fats, like saturated fat, should be limited because they increase cholesterol levels and the risk of heart disease.

Functions of Fat:

It serves as concentrated source of energy. 1 gm. of fat gives 9 kilo calories.

1. Fat serve as a vehicle for the absorption of fat soluble vitamins i.e. vit. A, D, E, K.
2. It provides cushion for protection of vital organs.
3. Lack of fat produces fast fatigue.
4. It provides energy for heart.

When the storage of CHO is utilized, the body breaks down tissue fat and protein to provide additional energy. So it is very important to the athlete to have an adequate amount of fat in the diet to prevent the breaks down of body protein, which is needed for tissue & reconstruction. Fat is stored when we consume more calories than we use. There is an optimal level of body fat for health and for athletic activity. When that optimal level is exceeded, too much dietary fat can lead to problems with health as well as athletic performance.

How Fat Provides Energy for Sports:

Fat provides the highest concentration of energy of all the nutrients. One gram of fat equals nine calories. This calorie density, along with our seemingly unlimited storage capacity for fat, makes fat our largest reserve of energy. One pound of stored fat provides approximately 3,600 calories of energy. While these calories are less accessible to athletes performing quick, intense efforts like sprinting or weight lifting, fat is essential for longer, slower lower intensity and endurance exercise such as easy cycling and walking. Fat provides the main fuel source for long duration, low to moderate intensity exercise (endurance sports such as marathons, and ultra marathons). Even during high intensity exercise, where carbohydrate is the main fuel source, fat is needed to help access the stored carbohydrate (glycogen). Using fat for fuel for exercise, however, is dependent upon these important factors:

Fat is slow to digest and be converted into a usable form of energy (it can take up to 6 hours). Converting stored body fat into energy takes time. The body needs to breakdown fat and transport it to the working muscles before it can be used as

energy. Converting stored body fat into energy takes a great deal of oxygen, so exercise intensity must decrease for this process to occur.

For these reasons, athletes need to carefully time when they eat fat, how much they eat and the type of fat they eat. In general, it's not a great idea to eat fat immediately before or during intense exercise.

Some Common Sources and Percentage of Fat

Name of item	Percentage of Fat
Cheese	25.1
Ghee	100
Milk (B)	8.8

C) Protein

Proteins are organic substances that after digestion yield their component building blocks amino acids. These amino acids combine together form proteins required by the body. Amino acids combine in various ways to make muscles, bone, tendons, skin, hair, and other tissues. They serve other functions as well including nutrient transportation and enzyme production. In fact, over 10,000 different proteins are in the body. These amino acids in food further have been classified as essential and non-essential. Those amino acids that the body can manufacture are termed as non-essential. Those amino acids that must be supplied in the diet are essential amino acids.

Some food including, egg, dairy produce and meat (so called complete food) contain all of amino acids (i.e. isoleucine, leucine, valine, methionine, theonine, lysine, phenylalanine & triptophan.)

If an individual's diet does not contain sufficient quantities of these food or a combination of other food, containing protein, tissue protein degradation increases resulting in decrease in body protein content. Long term protein energy

malnutrition (PEM) leads to decrease in muscle mass, strength, endurance and immune dysfunction. Adequate, regular protein intake is essential because it isn't easily stored by the body. Various foods supply protein in varying amounts with complete proteins (those containing 8 essential amino acids) coming mostly from animal products such as meat, fish, and eggs and incomplete protein (lacking one or more essential amino acid) coming from sources like vegetables, fruit and nuts. Vegetarian athletes may have trouble getting adequate protein if they aren't aware of how to combine foods.

Athletes need protein primarily to repair and rebuild muscle that is broken down during exercise and to help optimizes carbohydrate storage in the form of glycogen. Protein isn't an ideal source of fuel for exercise, but can be used when the diet lacks adequate carbohydrate. This is detrimental, though, because if used for fuel, there isn't enough available to repair and rebuild body tissues, including muscle.

Protein has very limited value as an energy reasoning food but it is very essential for growing process, repairing for cells, formation of certain hormones & enzymes. The amino acids which are not used in protein synthesis will either be oxidized or converted into CHO of fat.

Recommended Daily Protein Intake:

The average adult needs one grams protein per kilogram of body weight per day. Strength training athletes need about 2.0 to 2.5 grams per kilogram of body weight per day. Endurance athletes need about 1.5 to 2.0 grams per kilogram of body weight per day.

Proteins are present in both the plants and in animals.

Name of item [100 gm]	Percentage
Cereals	6.0-13.0
Pulses	17-25
Groundnut	25.3
Soyabeen	43.2
Almonds	20.8

Animal Proteins

Name of item [100 gm]	Percentage
Milk	3-4
Fish	20-22
Meat goat	21
Egg 1 piece	7.0
Chicken	20 g.

D) Vitamins

Vitamins are essential for normal growth, maintenance and for regulations of enzyme systems, control of metabolism & immune function. They themselves do not give energy, but they help in getting energy. Some vitamins acts as essential co-factors for enzymes involved in metabolism and biosynthesis, others act as antioxidants. Vitamins are divided into two groups which are as follows:

a) Fat Soluble

Vitamin A, D, E, and K can be stored in the body for varying length of time. Vit. A and beta carotene have anti-oxidant properties, Vit. A is essential to prevent night blindness & maintenance of surface cells. Vitamin A as such can only derived from animal sources e.g.- Fish liver oil, butter, cream, ghee. This carotene is converted to Vit. A in the human body., egg, liver, milk etc. Carotene act as antioxidant enzyme. It also protects RBC from hemolysis. Vegetable oils

are good sources of Vit. E. Wheat germ oil is rich source of ‘E’ Vitamin. Vit ‘D’ is essential for growth mineralization of bones. Vit 'K' is important in blood clotting mechanism.

b) Water Soluble

These vitamins play an important role in performance improvement. Therefore supplementation, particularly water soluble is recommended.

Functions:

Vitamin 'B’

Group of 8 water soluble vitamins key functions in macronutrient metabolism & energy metabolism**.** Vitamin B1 plays an important role in the oxidative decarboxylation of pyruvate to acetyl co-A an essential step in energy production from CHO. Vitamin B2 is involved in mitochondrial energy metabolism. Vitamin B6 plays an important role in protein synthesis. For this reason this vitamin is often assumed to be of crucial importance to strength athlete. Vitamin B12 functions as a co-enzyme in nucleic acid metabolism and influences protein synthesis. Sources - Cereals & pulses are good sources of Vitamin B Complex.

Vitamin 'C

It acts as an antioxidant. It protects Vit. 'E'. It participates in many enzymatic reactions by acting as an electron transmitter & involved in synthesis of collagen & carnitine. It enhances iron absorption. It is also needed for the bio-synthesis of some hormones. It is very helpful in recovery process.

Sources - fruits are good source of vitamin C. e.g. Oranges, Lemon, Guava, Amla, Papaya etc.

E) Minerals

The minerals play an essential role in functioning of immune cells. The body contains more than 19 minerals all of which must be derived from food. Minerals do not supply energy, but like vitamins are essential for regulation of body function. They are classified as Macrominerals & Microminerals.

1)Macrominerals

Are those minerals needed in relatively large amount (around 100 mg per day) and include calcium, sodium, magnesium, potassium, chloride.

2)Microminerals

These are required in much smaller daily amounts (less than 2-5 mg) and include iron, co5pper, zinc, iodine, sulphar, cobalt, chromium and selenium.

Functions:

Minerals are essential part of living cells. The hard skeletal, structures like bones, teeth are composed largely of minerals. They are essential for normal body functions such as : Contraction of muscles, Water balance, Acid-base equilibrium Utilization of food etc.

1) Potassium

It is important for the transmission of nerve impulses, membrane potential & hence muscle cell contraction and maintenance of normal blood pressure.

2) Calcium

It is essential for muscle contraction nervous activity, blood clotting & for maintenance of skeleton & teeth. Recommendations of calcium intake are based on levels than can promote calcium retention, maximize bone mineral density,

and inhibit bone loss. Lower calcium intake subjects the athlete to increased risk of stress fracture. Food that provide good calcium stores are the following: dairy products, fish with bones, broccoli, and fortified cereals and juices.

3) Iron

It is essential for the formation of hemoglobin. It is important for oxygen binding & transport as well as for the transfer of electrons in the electron transport chain & for energy production. Iron affects oxygen transport and aerobic metabolism. To achieve optimal aerobic endurance, consuming adequate amounts is a must. Iron depletion, the first stage of iron deficiency is the most common type of iron deficiency among athletes. Lean red meats, dark poultry, fortified cereals, whole grains, and legumes are good iron sources.

4) Sodium

It is essential for nerve impulse conduction & muscle contraction,

5) Zinc

Zinc, which is found in meat, poultry, seafood, and whole grains, is essential for protein synthesis, healing, and immune function. Zinc is also found in antioxidant enzymes and enzymes involved in energy metabolism

F) Water

Water is an important constituent of our diet. About 60-65% of the weight of an adult body is made up of water. From this amount of water a loss of 15% - 20%. may prove to be fatal. Water is present in two forms in our body.

a] Intra-Cellular i.e.

The fluid within the cells which is about 70%

b] Extra Cellular i.e.

The fluid outside the cells which is about 30%. Water is essential for life because it provides the medium with which all the chemical & biochemical processes occur.

Some of the important functions of water are as follows:

1] The maintenance of proper balance of electrolytes.

2] The regulation of body temperature.

3]Regulation of acid-base balance in the body.

4] Rending the waste from body.

5] It maintains blood fluid balance & feels it flowing in the body.

6] It helps in hydration.

7] It helps in maintaining osmosis.

8] It is the main medium of excretion.

Individual requires water depending upon his body weight. An average adult under normal conditions requires about 2 to 4 liters water intake per day for maintaining the water balance in the body. During exercise in hot environment the water loss through sweating increases tremendously and in such cases if water is not replenished then various forms of heat illnesses may occur.

1.4 Nutrition Requirement of Wrestlers

Nutritional condition should also be considered as an important part of athletes training. As the physically, active wrestlers burn more calories. Wrestling is highly energy demanding sport in comparison to other sports. So active wrestler burns more calories in comparison to the physically inactive individuals and put more stress on the metabolic process of the body. Therefore dietary requirements of wrestlers need a special consideration and are discussed below under the following headings: 1) Carbohydrate requirement of wrestler. 2) Fat requirement of wrestler. 3) Protein requirement of wrestler. 4) Vitamin & mineral requirement of wrestler.

1] CHO Requirement of Wrestler

Wrestling is very speedy sport and it needs intensive type of activity. There are 80-90% anaerobic activities in wrestling. So it needs glycogen store in muscles because only CHO (glycogen) provides energy an aerobically. Therefore during training consumption of 60 to 65% of the total calories in the form of complex CHO can best maintain glycogen level in wrestlers. Such as grains, breads, rice, potatoes pulse etc. There is a simple formula to know the daily required amount of CHO. Body weight (in kg) x 11 = Required amount of CHO in grams (S.R Sanga 2004)[5] For example: 100 kg wrestler requires 100 x 11= 1100 grams CHO (1 gm CHO contain 4 kcal) So 1100 X 4 = 4400 calories. = 60 - 65% of your total intake of calories.

2) Fat Requirement of Wrestler

Fat does not provide energy as fast as CHO. So in wrestling it is not a main fuel for energy liberation. But 5 to 7% of our body fat need to be maintained because

[5] S. R Sanga. *et al.* '' Wrestling Training Manual'', Patiala: SAI, Netaji Subhash National Institute of Sports.2004, p.18
.

some vitamins are soluble only in fat and also provides protection of vital organs. Lack of fat produces fast fatigue. Therefore 20 to 25% of wrestler's daily intake should be in the form of fat to maintain the nutrient balance. There is a simple formula to know the daily required amount of fat. Body weight in kg x 1.8 = required fat in gm. (S.R Sanga 2004)[6]. e.g. For 100 kg wrestler requires = 100 x 1.8 = 180 gms (1 gm of fat contain 9 kcal) So 180 X 9 = 1620 calories = 20 - 25 % of your total intake of Nutrients.

3) Protein Requirement of Wrestler

This is the least used energy source of wrestler, considering its other benefits around 15% of daily intake should be in the form of proteins to maintain the nutrient balance. But for growing children & during weight training & injury you want more protein. For Adults -2.0 to 2.5. gm/kg of body weight. For growing children - 2 gm/kg of body weight. (S.R Sanga 2004) [7].

4) Vitamin and Mineral Requirement of Wrestler

Adequate vitamin intake is very essential for wrestler because they are involved in the formation of RBC, the building of bones and protein metabolism. Some vitamins acts as coenzymes for the energy releasing chemical reactions of the body. Calcium is the most abundant mineral in the body. 99 % of calcium in the body is found in the hard body tissues such as bones and teeth, with the rest distributed in the blood, muscles, liver and heart.

---

[6] S. R Sanga. *et al.* '' Wrestling Training Manual'', Patiala: SAI, Netaji Subhash National Institute of Sports.2004, p.18
.

[7] S. R Sanga. *et al.* '' Wrestling Training Manual'', Patiala: SAI, Netaji Subhash National Institute of Sports.2004, p.19
.

Vitamin and minerals dosages recommended for wrestler /day

A	5000-15000 IU
B	25 - 60 Mg
C	1000-2000 Mg
D	400-800 IU
E	400-800 IU
Ca	1000-1500 mg
Mg	250- 650 mg
P	150-800 mg

1.4.1 CHO loading and Effect of poor CHO Diet

CHO Loading

CHO or glycogen loading is a dietary manipulation practiced to increase muscle glycogen to enhance the endurance of athlete to achieve better performance by using high CHO diet. Normally we can store 300 + 400gm glycogen in muscles and liver. But using the CHO loading method we should store glycogen till near by 1000 gm in muscles and liver. Wrestling is high energy demanding sport. In wrestling 80 to 90% energy comes from anaerobic pathways and that too mainly from lactic acid system. In this system the main fuel is glycogen. Therefore the method is very useful for wrestler to enhance performance. There are two phases of CHO loading: Depletion phase & Loading phase.

1) Depletion phase

First phase is called depletion phase. In this phase first three days a coach should give intensive session of training almost 80 to 90% of maximum. Same time we should give highly specific training because glycogen synthesis will take place in

that muscles which are involved in specific movements.

Main Points:

- Diet should be low in CHO during these three days.
- Total calorie need to be maintained.
- Highly specific training.
- Low CHO diet should be supplemented with fat and protein diet.
- Around 10-15 % of your total caloric should be in the form of CHO.

2) Loading Phase

Three days before competition there should be loading of CHO. The following points may be taken into consideration:

- High CHO Diet [Around 75 to 80% of total calorie].
- This CHO diet be at the cost of fat.
- Reduce the fat and increase CHO intake.
- Low intensity training [specific].
- We should prepare complex form of CHO diet.
- Sometimes muscle glycogen boosts twice as much as normal.
- Extra fluid must be consumed.

Effect of poor CHO Diet

When you eat any food containing CHO, some of the CHO is converted by your body into glycogen which is stored in your muscles. When you start exercise and need a 10+ energy quickly, the glycogen acts as fuel for your muscles. But when this fuel has been used up, tiredness sets in rapidly and you feel some of the following symptoms. Tired heavy limbs, poorer co-ordination, lapses in connection, slower recovery.

1.4.2 Concept of High Protein and High Fat Diet

a) Concept of High Protein Diet

Many athletes take high protein diet in order to increasing muscle mass. But eating high protein diet or supplementing the diet with additional amino acids will not itself result in any great increase in muscular mass. Before protein can be absorbed in the blood internal enzymes and acids digest protein into its components amino acids. If you eat more protein than your body can use, your kidney and liver must work harder, and remove these potential poisons. Extra protein converts into fat. When liver convert extra protein into fat, the nitrogen, the part of amino acid must be removed from the body. To do so liver makes uric acid of this nitrogen substance and kidney excrete the uric acid in urine. Since, more urine is formed to dispose of the increased ammonia and urea vital minerals such as potassium, magnesium, calcium are lost along with waste resulting in dehydration. Potassium helps control muscle temperature, blood flow and nerve conduction, calcium means strong bones and proper muscle functions, and magnesium helps in conversion of CHO in energy. Hence, excess protein can clearly hamper athlete performance and endurance through dehydration and essential minerals losses. Only so many amino acids can be used to make muscle tissue. Extra protein not used for energy but converted into fat by liver and stored.

One another problem of excessive protein consumption is that animal protein sources like red meat, whole milk, egg and most cheese also contain large quantities of saturated fat. This can contribute to store unwanted calories. It leads to increase in level of blood fat and cholesterol as well as increase in body fat, blood pressure and coronary heart diseases. This can turn into athlete's poor performance. Hence, wrestler must eat protein as per body requirement.

b)Concept of High Fat Diet

There is common practice of eating large amount of fat (e.g. Ghee) to increase muscle mass and strength. In fact, eating a high fat diet (ghee etc) will not increase 1 muscle mass or strength. There is no such evidence that large intake of fat will have beneficial effect on increase in muscle mass, muscular strength or physical performance. The excess fat is stored in adipose tissues further, metabolism fat produces ketone bodies and these can disturb acid base balance of body. Moreover, high fat diet leads to hypertension and development of coronary artery disease.

1.4.3 Pre competition and after Competition Diet.

a) Pre Competition or Pre-Event Meal

The food taken before bout is very important to optimize performance in the competition. Food is more of psychological but following points should be considered carefully:

- Take meal 1 to 1.5 hours before bout.
- Avoid unfamiliar food, do not try anything new.
- Take smaller, more frequent CHO & Protein meal as they are easier to digest.
- We should select food items from low glycemic food items.
- Avoid Animal Protein. Eg. Chicken, meat. Add milk, apple, wheat chapatti, dalia, brown rice, oats, hydro whey Vit. B etc.
- After taking meal, try to relax.
- Avoid gas forming food

b) After Competition Diet

Exercise can lead to a depletion of the body's glycogen stores, particularly those of the liver & in exercising muscle. Glycogen depletion results from the mobilization of the stores to provide energy for the muscular contraction of the exercise, and is a major factor contributing to fatigue. Therefore, to avoid this fatiguing condition there is need to take sufficient high glycemic CHO, fastest absorbed protein and fluid. The primary aim of CHO injection following exercise is to promote glycogen resynthesis and restoration of the muscle and liver glycogen utilized during exercise. The sole purpose of the post workout protein is to supply all amino acids in abundance to the broken down muscle and boost accelerated protein synthesis and muscle repair. The nature is which CHO with a high glycemic index and fast abrorbing protein are consumed after exercise immediately within 10 to 20 minutes because the greatest rate of muscle glycogen resynthesis occurs over the first 30 minutes immediately after exercise. The fastest absorbed protein to give rush of amino acids to muscle to boost anabolism. This is must to quickly stop catabolism and jump start anabolism so that it overtakes catabolism and the body can repair super compensate.

Antioxidants are the principal post workout vitamins. Due to high stress of an intense workout, destructive free radicals are produced and build up in the body towards the end of the workout. They attack and breakdown our muscles, immune system, digestive system, skin, hair and other body tissues. The body’s antioxidants defenses fall short and are unable to protect muscle tissue from such a massive free radicals attack. Hence antioxidants have to be supplied in large enough quantities to fight and nutrilise free radicles, to reduce muscle breaskdown [anti- catabolic and to

protect the immune system, skin, hair and other body tissues.So post workout antioxidants include the vitamin C & Vitamin E. Vitamin C is most powerful water soluble antioxidant. Total intake of vitamin C may be 2-3 grams per day. As a water soluble vitamin, it does not get stored in the body and no danger of toxicity. Vit E is the most powerful fat soluble antioxidant. Total intake of Vitamin E should be maximum 800 IU per day. As a fat soluble vitamin, it is stored in the body and has the risk of toxicity if taken in excess.

1.4.4 Fluid Replenishment and Glycemic Index

a) Fluid Replenishment

What happens when body gets dehydrated?

Dehydration can affect the body in many ways. In the early stages of dehydration you may experience fatigue & muscle soreness. As the blood volume decreases & the blood becomes thicker. The heart must work harder to pump blood and nutrients to working muscles when dehydrated the body will sweat less to conserve water. With less sweat to cool the body it will slow down to stop itself overheating. Moderate dehydration, by little, as 1-2% of body weight, has been shown to result in a decrease in maximal aerobic capacity, physical work capacity, muscle strength & endurance & athletic performance.

How much fluid should be taken when training & competing

- Drink 250-500 ml two hour before exercise to provide hydration and CHO.
- Drink 125 to 250 ml immediately before exercise to provide additional hydration and CHO.
- Drink at least 125-200 ml every 20 to 25 minutes during exercise to maintain fluid levels.
- Drink 250-500 ml immediately after exercise to restore fluid and CHO.

b) Glycemic Index

Glycemic Index is a measure of the rise of blood glucose level for a period of time after eating a standard amount of CHO. CHO foods that enter the blood stream rapidly after ingestion would be classified as having a high glycemic index, food that enter the blood stream slowly have a low glycemic index. Glycemic index based on the blood glucose response evoked and compared to the response to an equivalent amount of glucose.

List of Glycemic Index of Foods

Food	Glycemic Index
Glucose	100
Honey	87
Potato	70
S. Potato	48
Soyabeans	15
Apples	36
Banana	65
Dates	72
Orange	40
Cornflake (Maize)	85
Rice	60-70
Wheat	64

1.5 Statement of the Problem

A wrestler's diet has a profound impact on overall performance. Wrestling is a very physically demanding sport. Proper nutrition helps a wrestler feel strong both physically and mentally. However, the wrong diet can lead a wrestler feeling weak, dehydrated, and unproductive in their training. Many wrestlers do not receive proper nutrition that is required to compete in this sport. **This is**

generally due to a wrestler's lack of knowledge or unconcerned attitude toward his nutritional needs and/or misinformation or poor financial status. Successful wrestlers know that good nutrition is an essential component of their daily training ritual. They realize that good eating habits help them to compete at a much higher level of competitions.

Furthermore, the concept of weight classes in wrestling competitions has led many wrestlers to engage in poor weight loss practices. After an extensive review of the literature, three main areas were identified as potentially harmful to the well being of amateur wrestlers. Nutritional habits are the first area. Wrestling is a demanding sport that stresses the importance of keeping one's body in great condition. However, in an attempt to make the weight, it is common to reduce a diet's caloric intake down to the very minimal level. Wrestlers will reduce the calories they eat in order to minimize the amount exercise they perform. With less caloric intake, there is less weight to lose. As stated by Roemmich *et al.*, (1997)[8] and Roemmich *et al.*, (1997)[9] wrestlers typically consume foods high in carbohydrates (61%) and fats (24%). Carbohydrates are vital for a wrestler to maintain peak performance (McMurray *et al.*, 1991)[10]. Despite the importance of a high protein diet (Lemon 2000)[11], wrestlers on average only consume about 0.9 g*kg of protein a day. The National Association of Biology Teachers indicates that 3000 calories a day is not even enough to sustain primary body functions in a wrestler. Calories are crucial for maintaining a high level of energy and stamina for any athlete. As any coach would agree, the

---

[8] James. N. Roemmich, *et al*. "Weight loss and wrestling training: Effects on growth- related hormones." Journal of Applied Physiology, 15, 1997, pp.1760-1764.

[9] James. N. Roemmich, *et al*. "Weight Loss and Wrestling Training: Effects on Nutrition, Growth, Maturation, Body Composition, and Strength." Journal of Applied Physiology, 15, 1997, pp.1751-1759.

[10] R. G. McMurray *et al*. "Effect of caloric deficit and dietary manipulation on aerobic and anaerobic exercise." International Journal Sports Medicine, 12, 2, 1991, pp.167-172.

[11] Peter. Lemon, "Beyond the zone: Protein needs of active individuals." Journal of the American College of Nutrition, 19, 5, 2000, pp.513-521.

wrestler who has more stamina with proper calorie intake, will win more often than not, and be less likely to be injured.

Moreover, it was observed that one of the main reasons wrestlers have unhealthy nutritional habits is binge eating. Wrestlers often binge following a meet, after abstaining from food during the week to make weight. Research has shown that roughly 97% of wrestlers binge eat, with 85% binge eating a minimum of once a week (Lakin 1990)[12]. A more recent survey conducted found that roughly 2/3 of wrestlers' admits to binge eating. Of the wrestlers that binge 63% typically binge on foods that are less healthy than what is typically eaten while cutting weight. The first problem with binge eating is that the wrestler is consuming a majority of his entire week's calories in one day. This causes not only a decrease in the intake of food during the week, but binging also hampers performance both during practices and meets by lowering the available energy for those events. Many wrestlers forego proper nutrition in order to satisfy a desire to binge on unhealthy food. This binging should be rectified with a steady healthy diet. In regards to the total calories consumed by wrestlers, carbohydrates should contribute 60%, proteins should contribute 20%, and fats should contribute 20% (Thompson and Veneman, 2005).[13]

Thus, nutritional knowledge and practices are very important for wrestlers to achieve high performance in competitions. Wrestling is the sport of different weight categories; therefore the caloric requirement of different weight category of wrestlers is also different. The wrestlers can maintain their bodyweight only if the total energy intake is equal to energy expenditure. If the intake is more than energy expenditure then the weight increases. Considering the present scenario

[12] B. Lakin, and A., J, "Eating behaviors, weight loss methods, and nutrition practices among high school wrestlers. Journal of Community Health Nursing, 7, 4, 1990, pp.223-234.

[13] T. G. Thompson, and A. M. Veneman, "Dietary Guidelines for Americans." U.S. Department of Health and Human Services, 2005.

of wrestling culture in Maharashtra, the researcher is in a dilemma about … *"Do the wrestlers have in depth knowledge of balanced diet required for them? Do they practice their knowledge of nutrition in their day to day practice or not?"* Perceiving these aspects the present researcher has undertaken this piece of research entitled, **"A Critical Study of Nutritional Knowledge and Practices among the Wrestlers in Maharashtra".**

1.6 Problem and its relevance

Adolescent athletes who participate in weight-classified sports such as wrestling are at risk for developing eating disorders or disordered eating patterns due to lack of nutrition knowledge. In fact, nutrition control is a major factor in coordinating and organizing training to achieve best results in sports activities in general and specifically in weight dependant sports (Kadous 1993)[14]. Weight control is a very important aspect that coaches should consider because of the clear relation between weight control and motor performance of athletes. In addition, weight is the base for involving in sports like boxing and wrestling (Al-Hawy 2000)[15]. Nutrition control plays a major role in stabilizing and maintaining weight so that each athlete plays according to a fixed weight and if he/she gains more weight he/she is at risk of being eliminated from the competition and due to that all his/her efforts, along with the coach's efforts might go in vain. So, each athlete needs to control his/her weight to avoid exhaustion of weight lose that may affect the performance level during competitions (Othman 2000)[16].Weight control depends on the kind of food and level of physical activity, along with correct nutrition habits. However, to maintain weight fasting, purging,

[14] S.A. Kadous,. Scientific bases of boxing. Dar Al-Maaref, 1 Ed., Cairo, Egypt, 1993, pp. 165--181.

[15] Y. A. E. Al-Hawy, Boxing: theoretical bases and application. Al-Aziz for Publishing, Zagazig, Egypt, 2000, p.30.

[16] H. E. Othman, M.A. Ghonaim, D.M. Al-Azab and A.M. Shalan, Boxing: Teaching, management and training. Dar Al-Saada Press, Cairo, Egypt, 2000, pp: 428-349.

restricting fluids, and using laxatives and diuretics are frequently observed behaviors among wrestlers. This often results in severe dehydration which may lead to heart abnormalities and even death. Wrestling coaches strongly influence the knowledge and behaviors of their athletes. It is well recognized that optimal nutrition can enhance athletic performance (American College of Sports Medicine, American Dietetic Association, & Dietitians of Canada, 2000)[17]. However, numerous barriers can hinder athletes from achieving optimal dietary practices, including a lack of time, insufficient financial resources, limited meal-planning and preparation skills, and busy travel schedules (Malinauskas, Overton, Cucchiara, Carpenter, & Corbett, 2007; Palumbo, 2000)[18]. Previous studies on athletes' nutrition knowledge indicate that many college athletes do not understand basic nutrition concepts yet are receptive to receiving nutrition education (Cho & Fryer, 1974; Froiland, Koszewski, Hingst, & Kopecky, 2004; Grandjean, Hursh, Majure, & Hanley, 1981; Jonnalagadda, Rosenbloom, & Skinner, 2001; Perron & Endres, 1985; Werblow, Fox, & Henneman, 1978; Zawila, Steib, & Hoogenboom, 2003)[19,20,21,22,23,24,25]. Nevertheless, nutrition

---

[17] American College of Sports Medicine, American Dietetic Association, & Dietitians of Canada, "Nutrition and athletic performance." Medicine and Sport Science, 32, 12, 2000, pp.2130–2145.

[18] B. M. Malinauskas, R. F. Overton, A. J. Cucchiara, A. B. Carpenter, and A. B. Corbett, "Summer league college baseball players: Do dietary intake and barriers to eating healthy differ between game and non-game days? The Sport Management and Related Topics Journal, 3, 2, 2007, pp.23–34.

[19] M. Cho, and B. A. Fryer, "Nutritional knowledge of collegiate physical education majors." Journal of the American Dietetic Association, 65, 1974, pp.30–34.

[20] K. Froiland, W. Koszewski, J. Hingst, and L. Kopecky, "Nutritional supplement use among college athletes and their sources of information." International Journal of Sport Nutrition and Exercise Metabolism, 14, 2004, pp.104–120.

[21] A. Grandjean, L. M. Hursh, W. C. Majure, and D. F. Hanley, "Nutrition knowledge and practices of college athletes." Medicine and Science in Sports and Exercise, 13, 2, 1981, p.82.

[22] S. S. Jonnalagadda, C. A. Rosenbloom, and R. Skinner, "Dietary practices, attitudes, and physiological status of collegiate freshman football players." Journal of Strength and Conditioning Research, 15, 4, 2001, pp.507–513.

[23] M. Perron, and J. Endres, "Knowledge, attitudes, and dietary practices of female athletes. Journal of the American Dietetic Association, 85, 1985, pp. 573–576.

information is imparted to athletes from diverse sources including coaches, teammates, athletic trainers, fitness trainers, parents, supplement manufacturers, and the media (Rosenbloom, Jonnalagadda, & Skinner, 2002)[26]. Unfortunately, many of these sources are not suitable, and at times the information imparted is unreliable and only adds to the myths surrounding nutrition that may affect athletes' diet (Barr *et al*., 1997)[27].

Finally, previous studies in wrestlers revealed a central role for coaches and trainers in nutrition education (Mosavi Jazayeri & Amani, 2004)[28]. Further, most trainers were found to prescribe diet programs and advise consumption of anabolic hormones to their trainees, yet their nutrition knowledge was considered low. Therefore, the aim of this research was to investigate the level of nutrition knowledge among wrestlers and develop nutrition knowledge inventory for wrestlers in Maharashtra.

1.7 Objectives of the Study

This study was conducted with following objectives:

- To develop a standard test to measure Knowledge of Nutritional practices of the wrestlers in Maharashtra State.

---

[24] J. A. Werblow, H. M. Fox, and A. Henneman, "Nutritional knowledge, attitudes, and food patterns of women athletes." Journal of the American Dietetic Association, 73, 1978, pp.242–245.

[25] L. G. Zawila, C. M. Steib, and B. Hoogenboom, "The female collegiate cross-country runner: Nutritional knowledge and attitudes." Journal of Athletic Training, 38, 1, 2003, pp.67–74.

[26] C. A. Rosenbloom, S. S. Jonnalagadda, and R. Skinner, "Nutrition knowledge of collegiate athletes in a Division I National Collegiate Athletic Association institution." Journal of the American Dietetic Association, 102, 3, 2002, pp.418–420.

[27] S. I. Barr, and R. P. Heaney, "Changes in bone mineral density in male athletes." Journal of the American Medical Association, 277, 1, 1997, pp.22–23.

[28] S. M. H. Mosavi Jazayeri, and R. Amani, "Nutritional knowledge and practices of bodybuilding trainers in Ahwaz, Iran. Pakistan." The Journal of Nutrition, 3, 4, 2004, pp.228–231.

- To assess the knowledge and practices regarding nutrition among the wrestlers in Maharashtra State.
- To find out caloric value of present diet of wrestlers in the State.
- To critically analyze proper nutrition requirements during the training and competition period and off season for wrestlers in Maharashtra.

1.8 Hypotheses

After reviewing the literature and on the basis of extensive experience, the researcher formulated hypotheses as follows:

HO_1: Nutritional knowledge and practices among the wrestlers in Maharashtra may not be proper as per the requirement.

HO_2: There will be no difference in nutritional status of the wrestlers of different weight categories.

HO_3: Caloric value of present diet of wrestlers in the State may not be proper as per the requirement.

1.9 Delimitation of the Study

The present investigator delimited the study as follows:

- The study has been delimited for only male wrestlers those who are practicing in SAI (Sports Authority of India) centers and adopted Akharas in Maharashtra State.
- The study has been delimited to the wrestlers aged 19 years and above.
- This study also delimits the wrestlers of seven weight categories i.e. 55Kg., 60Kg, 66Kg., 74Kg., 84Kg., 96 kg and 96+ Kg.

1.10 Limitations of the Study

While conducting the experiment, the present investigator has recorded some drawbacks/limitations as follows:

- Heredity and environment factors were not considered while selecting wrestlers for the present study.
- Achievement in wrestling performance in any competition was not considered while selecting wrestlers.
- No special motivational technique was used by the Investigator while conducting survey that might influence the performance of the subjects and is considered as one of the limitations.
- Regarding calculations of caloric value the present investigator has considered the food items consumed averagely per day by wrestlers.
- The researcher cannot control the variation in the food items, the wrestlers are taking for the longer period of time.

1.11 Significance of the Study

- The study may help to provide the nutritional knowledge among the wrestlers in Maharashtra.
- The study might provide the nutritional practices among the wrestlers in Maharashtra.
- The study may help to develop good food habits among the wrestlers in Maharashtra.
- The study may help to achieve high performance in wrestling competitions by taking care of proper diet.

- The study may be of great help in understanding the nutritional knowledge & its practices to coaches and concerned authorities of wrestling in the state of Maharashtra.

- The study may help to design balanced nutritional chart for various age and weight category wrestlers in Maharashtra.

1.12 Operational Definitions of terms used

Nutrition knowledge

The process of nourishing or being nourished, especially the process by which a living organism assimilates food and uses it for growth and for replacement of tissues is known as nutrition while the detail knowledge about the dietary factors in food is called as nutrition knowledge.

Nutritional practices

Nutrition is a science or study that deals with food and nourishment, especially in humans and the practices followed to nourishment is called as nutritional practices.

Wrestlers

Wrestling is sport that deals with the hand-to-hand combat between two unarmed contestants, who seek to throw each other. It is a struggle between two persons to see who puts the other down to the earth. Wrestlers are those, who have some expertise or knowledge of participation in competitive wrestling.

Maharashtra

Maharashtra is a state located in India. It is the second most populous after Uttar Pradesh and third largest state by area in India. Maharashtra is also called breath of India being the richest state in India, contributing 15% of the country's industrial output and 13.3% of its GDP (2006–2007 figures). The Marathi-speaking section of the region became a separate state in 1960.