International Journal of Physical Education, Sports and Health 2016; 3(6): 259-264

P-ISSN: 2394-1685
E-ISSN: 2394-1693
Impact Factor (ISRA): 5.38
IJPESH 2016; 3(6): 259-264

www.kheljournal.com
Received: 12-09-2016
Accepted: 13-10-2016

Jaswinder Singh
Assistant Professor,
Pb. Govt. College of Physical Education, Patiala, Punjab, India

Correspondence
Jaswinder Singh
Assistant Professor,
Pb. Govt. College of Physical Education, Patiala, Punjab, India

Nutritional patterns of aerobic and anaerobic capacity players

Jaswinder Singh

Abstract
The present study was conducted on total 240 male players including aerobic players of handball, football, basketball, cycling and male anaerobic players of weightlifting, wrestling, swimming and 100mts. running only. The players under investigation were consisting of those who took part in all India Interuniversity level. The subject will be selected from the states of North Zone including Punjab, Haryana, Chandigarh, Himachal Pradesh, Delhi. The study was conducted on male players ranging age 18-25 years. Mean, SD, SEM, Coefficient of variance were calculated. 't-test' and ANOVA was applied for finding significant effects. The results described significant difference in proteins, carbohydrates, fats, and calories between aerobic and anaerobic groups. ANOVA revealed significant differences in proteins, carbohydrates, fats, and calories among mean values of aerobic group of handball, football, cycling and basketball players and significant differences in proteins, carbohydrates, fats, and calories among mean values of anaerobic group of weight lifting, wrestling, swimming, and 100 m players. In the aerobic group the Mean values of proteins showed significant difference between football and handball, football and cycling, football and basketball, handball and cycling, cycling and basketball. Whereas carbohydrates showed a significant difference between football and cycling, handball and cycling, handball and basketball. Fats showed significant difference between football and handball, football and cycling, football and basketball, handball and basketball, cycling and basketball. Calories showed significant difference between football and cycling, football and basketball, handball and cycling, handball and basketball. While in the anaerobic group the carbohydrates showed a significant difference between weight lifting and wrestling. Fats showed significant difference between weight lifting and wrestling, wrestling and swimming, wrestling and 100 m, swimming and 100 m. Calories showed significant difference between weight lifting and wrestling, weight lifting and 100 m, wrestling and swimming, swimming and 100 m.

Keywords: Nutritional patterns, aerobic, anaerobic capacity players

Introduction
Food is the necessity of life. The food we eat is digested and assimilated in the body and used for its maintenance and growth. Nutrition of sports men like that of every other person is aimed mainly to provide adequate quantity of energy and essential nutrients, with increasing awareness in the competitive sports and physical fitness in the world over the target of each nation is to get higher level of performance. The nutritional status of sports men may differ widely with respect to the ideal pattern of a healthy and adequate nourished individual because of number of factors related to the sports. The sports scientist is now doing their best to reach the core of this objective.

Nutritional status plays an important role in the energy requirements of different level of competition and also guarantees a good physical performance. Nutritional requirements are not same at various periods of growth. Requirements vary widely with age, sex, body size, growth pattern, climate and state of health of person. Sports is becoming increasingly competitive. More and more stress is being placed on how well you perform. To reach your highest potential, all of your body systems must be perfectly tuned. Nothing is more important to your well-being and ability to perform than good nutrition. Eating the right foods helps you maintain desirable body weight, stay physically fit, and establish optimum nerve-muscle reflexes. Without the right foods, even physical conditioning and expert coaching aren't enough to push you to your best. Good nutrition must be a key part of your training program if

you are to succeed. The Nutrition of players is as important as designing of their training schedule and the selection of the methodology for imparting sports skills. The nutritional requirements of players are more than non players is all respect. Since player have to maintain fitness to enable them to be ready for action, (Naughtion, 1970).

The nutrients--the proteins, carbohydrates, fats, vitamins, minerals, and water--are teammates that work together to provide good nutrition. Just as each team member carries out different tasks during a game, each nutrient performs specific functions in your body. A lack of just one nutrient is a disadvantage to your body, just as losing a player to the penalty box is a disadvantage for a hockey team. Your body needs all these nutrients all of the time, so the foods you eat should supply them every day.

The view of sports nutrition today has much evolved from the ancient Olympic gladiators' meal plan. Scientists are continually interested in learning more about this abiding subject. However, states Maughan, "without proper nutrition, the full potential of the athlete will not be realized, because performance will not be at its peak, training levels may not be sustained, recovery from injury will be slower, and the athlete may become more susceptible to injury and infection." Understanding sports nutrition leads to optimal athletic performance and lifetime health benefits and can thus be evaluated by the intake of certain nutrients and supplements when exercising, by learning the way the body utilizes these materials and how these practices complement future diet and exercise of the individual

Differing conditions and objectives suggest the need for athletes to ensure that their sports nutritional approach is appropriate for their situation. Factors that may affect an athlete's nutritional needs include type of activity (aerobic vs. anaerobic), gender, weight, height, body mass index, workout or activity stage (pre-workout, intra-workout, recovery), and time of day (e.g. some nutrients are utilized by the body more effectively during sleep than while awake). Most culprits that get in the way of performance are fatigue, injury and soreness. A proper diet will reduce these disturbances in performance. The key is to get a variety of food, to get all the macronutrients, vitamins, and minerals. According to Eblere's article (2008), it is optimal to choose raw, unprocessed foods such as oranges instead of orange juice. Eating foods that are natural means the athlete is getting the most nutritional value out of the food. When foods are processed it normally means that nutritional value is reduced. Sports nutrition is the study and practice of nutrition and diet as it relates to athletic performance. It is concerned with the type and quantity of fluid and food taken by an athlete, and deals with nutrients such as vitamins, minerals, supplements and organic substances such as carbohydrates, proteins and fats. Although an important part of many sports training regimens, it is most commonly considered in strength sports (such as weight lifting and bodybuilding) and endurance sports (for example cycling, running, swimming

The goal of training is to prepare the distance athlete to perform at his or her best during major competitions. Whatever the event, nutrition plays a major role in the achievement of various factors that will see a runner or walker take the starting line in the best possible form. Everyday eating patterns must supply fuel and nutrients needed to optimize their performance during training sessions and to recover quickly afterwards. Carbohydrate and fluid intake before, during, and after a workout may help to reduce fatigue and enhance performance. Recovery eating should also consider issues for adaptation and the immune system that may involve intakes of protein and some micronutrients. Race preparation strategies should include preparation of adequate fuel stores, including carbohydrate loading for prolonged events such as the marathon or 50-km walk. Fluid and carbohydrate intake during races lasting an hour or more should also be considered. Sports foods and supplements of value to distance athletes include sports drinks and liquid meal supplements to allow nutrition goals to be achieved when normal foods are not practical. While caffeine is an ergogenic aid of possible value to distance athletes, most other supplements are of minimal benefit.

The nutritional requirements of the training and competition programmes of elite endurance cyclists are challenging. Notwithstanding the limitations of dietary survey techniques, studies of high-level male road cyclists provide important information about nutrient intake and food practices during training and major stage races. Typically, male cyclists undertaking intensive training programmes report a high energy intake (> or = 250 kJ/kg/day) and carbohydrate (CHO) intakes of 8 to 11 g/kg/day. Intakes of protein and micronutrients are likely to meet Recommended Dietary Intake levels, because of high energy intakes. Data on female cyclists are scarce. Stage racing poses an increased requirement for energy and CHO, with daily energy expenditure often exceeding 25 MJ. This must be achieved in the face of practical constraints on the time available for eating, and the suppression of appetite after exhausting exercise. However, studies show that male cyclists riding for professional teams appear to meet these challenges, with the assistance of their medical/scientific support crews. Current dietary practices during cycle tours appear to favour greater reliance on pre-stage intake and post-stage recovery meals to achieve nutritional goals. Recent reports suggest that current riding tactics interfere with previous practices of consuming substantial amounts of fluid and CHO while cycling. Further study is needed to confirm these practices, and to investigate whether these or other dietary strategies produce optimal cycling performance. Other issues that should receive attention include dietary practices of female cyclists, beliefs and practices regarding bodyweight control among cyclists, and the use of supplements and sports foods

Athletes do not achieve sound nutritional practices to optimise their sports performance. Factors include poor nutrition knowledge, dietary extremism, poor practical skills in choosing or preparing meals, and reduced access to food due to a busy lifestyle and frequent travel. Education in nutrition for the athlete needs to be practical, so as to address eating strategies and key food and fluid choices that will help to achieve the goals of sound nutrition. Strategies that can achieve a number of nutritional goals simultaneously are most useful, since athletes often find it difficult to integrate separate issues. Athletes with extreme nutrient requirements, or with nutritional problems, should seek individual assessment and counselling from a sports nutrition expert

Objectives of the Study

Present study will be conducted with the following objectives:-

1. To find out the nutritional patterns of aerobic capacity players.
2. To find out the nutritional patterns of anaerobic capacity players.
3. To find out the significant difference in nutritional pattern between aerobic and anaerobic capacity players.

Delimitations

1. The study was delimited to male aerobic players of handball, football, basketball, cycling, and male anaerobic players of weightlifting, wrestling, swimming and 100mtrs. running only.
2. The players under investigation was consist of those who took part in all India interuniversity level.
3. The data was collected during the year 2011-12, 2012-13, 2013-14, 2014-15.
4. The subjects was selected from the state of north zone including Punjab, Haryana, Chandigarh, Himachal Pradesh, Delhi.
5. The study was delimited to male players ranging age 18 to 25 years.

Hypotheses

1. It was hypothesised that there will be significant relationship between nutritional patterns and aerobic capacity players.
2. It was hypothesised that there will be significant relationship between anaerobic capacity players.
3. It was hypothesised that there will be significant difference in nutritional pattern between aerobic and anaerobic capacity players.

Procedure and Methodology

In this chapter, the procedure adopted for the selection of subjects, reliability of data, selection of variables, collection of data and statistical technique for analysing the data had been described.

Reliability of Data

Before proceeding to collect the actual data, the reliability of the data was ensured by establishing instrument reliability, the tester's competence and the reliability of tests.

Instruments Reliability

All the instruments required for the collection of data had been obtained from reputed suppliers of standard equipment which was procured by the department of physical education, Punjabi university, Patiala and Punjab Govt college of physical education, Patiala. Thus their calibrations were accepted as accurate enough for the purpose of this study.

Testers Reliability

To ensure that the investigator is well versed with technique of conducting the tests, the investigator had a number of practice sessions in testing procedure under guidance of the expert. The investigator took all the measurement with the assistance of qualified testers, who were also acquainted the tests.

Selection of the subjects

The study was conducted on total 240 male players including aerobic players of handball, football, basketball, cycling and male anaerobic players of weightlifting, wrestling, swimming and 100mts. running only. The players under investigation were consisting of those who took part in all India Interuniversity level. The subject will be selected from the states of North Zone including Punjab, Haryana, Chandigarh, Himachal Pradesh, Delhi. The study was conducted on male players ranging age 18-25 years.

Selection of Variables

In consultation with the experts of the field, minutely going through the literature available and considering the feasibility criteria in mind, especially the availability of equipment, the following Anthropometric measurements were taken on right side of all the subjects by using the standard techniques. The following variables were selected for the present study:

1. Carbohydrates
2. Fats
3. Proteins
4. Calories

Administration of the daily food intake

The evaluation of intake the energy as quantified by food intake was carried out by recall method. Three weeks and total 21 days food record was obtained and average value was used for interpretation.

To find out the total caloric value of all the food eaten and composition of food items in terms of grams of Proteins, Carbohydrates, Fat and total calorie burnt was consulted from the following books :-

i) Value of Indian foods, Gopalan C., S.C. Balacubramanyam, B.V. Ramashastri (1971).
ii) Recommended dietary allowances for Indians, ICMR (1998).
iii) Essentials of food and nutrition, Swaminathan, M. (1985).
iv) Nutrition, Exercise and weight Reduction, Verma S.K., R. Mokha (1994).

Durnin and womersley (1974) method will be used to find out the body density from which %age body fat will be calculated by using Siri's (1961) equation.

Statistical Analysis of the Data

Appropriate statistical tools were employed for describing the results and also their interpretation. Statistical correlates like Mean, SD, SEM, Coefficient of variance were calculated. 't-test' and ANOVA was applied for finding significant effects.

Conclusions of the Study

Table 1

Variable	Aerobic		Anaerobic		t-test	Sig
	Mean	Sd	Mean	Sd		
Proteins	271.69	24.31	283.27	32.12	-3.501	.001
Carbohydrates	758.31	31.02	686.46	44.70	16.335	.000
Fats	236.81	40.80	224.38	48.01	2.354	.019
Calories	6504.54	383.14	6121.61	507.04	7.342	.000

Descriptive statistics for proteins, carbohydrates, fats, and calories between aerobic and anaerobic groups

* Significant at 0.05 level of significance

Descriptive statistics for proteins, carbohydrates, fats, and calories between aerobic and anaerobic groups is presented in table1. Mean proteins of aerobic was 271.69 gm and anaerobic group possessed 283.27 gm. The mean carbohydrates of aerobic group was 758.31gm where as anaerobic showed 686.46 gm. The mean fats of aerobic group was 236.81 gm where as anaerobic showed 224.38 gm. The mean calories of aerobic group was 6504.54 kcal where as anaerobic showed considerable value i.e. 6121.61 kcal. As it is evident from the

p- values, there was significant difference in proteins, carbohydrates, fats, and calories between aerobic and anaerobic groups.

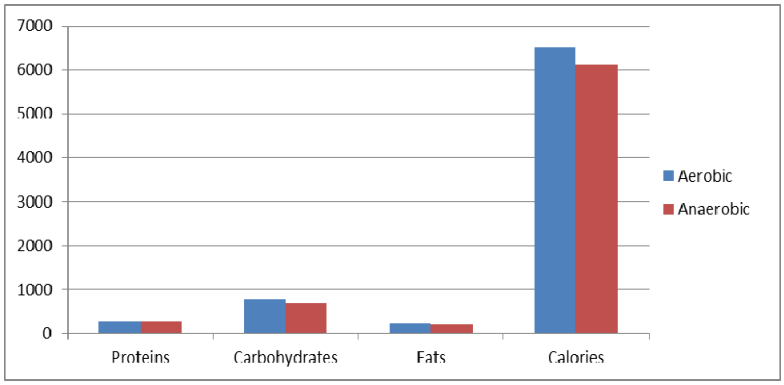

Table 2: Descriptive statistics and ANOVA for proteins, carbohydrates, fats, and calories among aerobic group of Handball football cycling and basketball players.

Variable	Handball (n=60)		Football (n=60)		Cycling (n=25)		Basketball (n=60)		f-ratio	Sig.
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Proteins	263.92	20.84	277.00	15.56	305.20	25.83	260.20	19.87	34.94	0.00
Carbohydrates	753.63	21.76	757.78	17.24	782.32	30.56	753.52	43.44	6.40	0.00
Fats	234.70	33.37	209.40	38.46	235.36	33.77	266.93	31.71	27.91	0.00
Calories	6432.80	330.00	6272.57	384.52	6732.92	287.04	6713.08	301.69	22.19	0.00

* Significant at 0.05 level of significance

Descriptive statistics for proteins, carbohydrates, fats, and calories of handball, football, cycling and basketball players is presented in table 11. It was noticed that players of cycling possessed maximum intake of proteins 305.20 gm followed by football players 277.00 gm, handball players 263.92 gm and basketball players 260.20 gm respectively. Results depicted that players of cycling possessed maximum intake of carbohydrates 782.32 gm and it was followed by football players 757.78 gm, handball players 753.63 gm and basketball players 753.52 gm. The players of basketball possessed maximum intake of fats 266.93 gm followed by cycling players 235.36 gm, handball players 234.70 gm and football players 209.40 gm respectively. The players of cycling possessed maximum intake of calories 6732.92 kcal followed by basketball players 6713.08 kcal, handball players 6432.80 kcal and football players 6272.57 kcal respectively. ANOVA revealed significant differences in proteins, carbohydrates, fats, and calories among mean values of handball, football, cycling and basketball players.

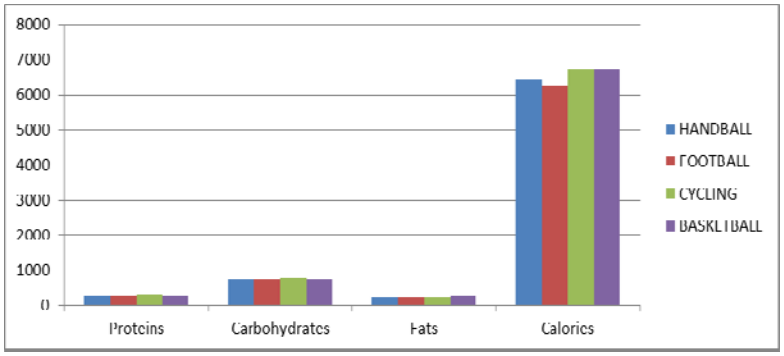

Table 3: Descriptive statistics and ANOVA for proteins, carbohydrates, fats, and calories among anaerobic group of weight lifting, wrestling, swimming, and 100 m players.

Variable	Weight Lifting (n=25)		Wrestling (n=25)		Swimming (n=25)		100 M (n=25)		f-ratio	Sig.
	Mean	SD	Mean	SD	Mean	SD	Mean	SD		
Proteins	281.84	31.21	270.76	23.97	275.16	22.26	305.32	38.35	6.74	0.00
Carbohydrates	664.52	40.71	708.84	36.26	693.12	53.00	679.36	36.58	5.04	0.00
Fats	200.08	23.32	266.00	61.17	199.56	26.62	231.88	37.32	15.63	0.00
Calories	5807.12	293.75	6507.60	573.85	5902.84	337.92	6268.88	447.24	14.50	0.00

* Significant at 0.05 level of significance

Descriptive statistics for proteins, carbohydrates, fats, and calories of weight lifting, wrestling, swimming, and 100 m players is presented in table 11. It was noticed that players of 100 m possessed maximum intake of proteins 305.32 gm followed by weight lifting players 281.84 gm, swimming players 275.16 gm and wrestling players 270.76 gm respectively. Results depicted that players of wrestling possessed maximum intake of carbohydrates 708.84 gm and it was followed by swimming players 693.12 gm, 100 m players 679.36 gm and weight lifting players 664.52 gm. The players

of wrestling possessed maximum intake of fats 266.00 gm followed by 100 m players 231.88 gm, weight lifting players 200.08 gm and swimming players 199.56 gm respectively. The players of wrestling possessed maximum intake of calories 6507.60 kcal followed by 100 m players 6268.88 kcal, swimming players 5902.84 kcal and weight lifting players 5807.12 kcal respectively. ANOVA revealed significant differences in proteins, carbohydrates, fats, and calories among mean values of weight lifting, wrestling, swimming, and 100 m players.

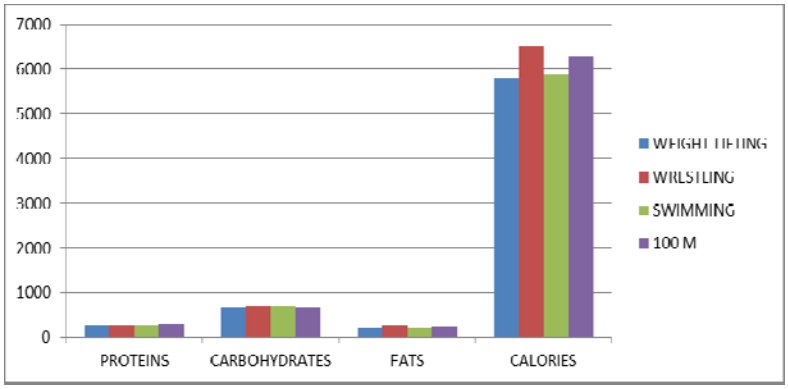

Table 4: Post hoc comparison of adjustment means of aerobic group of handball, football, cycling and basketball players in relation to proteins, carbohydrates, fats, and calories.

Variable	Football Vs Handball	Football Vs Cycling	Football Vs Basketball	Handball Vs Cycling	Handball Vs Basketball	Cycling Vs Basketball
Proteins	-13.08333*	28.20000*	16.80000*	-41.28333*	3.72	45.00000*
Carbohydrates	-4.15	24.53667*	4.27	-28.68667*	0.12	28.80333*
Fats	28.80333*	25.96000*	57.53333*	-0.66	-32.23333*	-31.57333*
Calories	160.23	460.35333*	440.51667*	-300.12000*	-280.28333*	19.84

* Significant at 0.05 level of significance

Table 4 shows comparison of proteins, carbohydrates, fats, and calories between football and handball, football and cycling, football and basketball, handball and cycling, handball and basketball and cycling and basketball players. It was observed that mean values of proteins showed significant difference between football and handball, football and cycling, football and basketball, handball and cycling, cycling and basketball. Whereas carbohydrates showed a significant difference between football and cycling, handball and cycling, handball and basketball. Fats showed significant difference between football and handball, football and cycling, football and basketball, handball and basketball, cycling and basketball. Calories showed significant difference between football and cycling, football and basketball, handball and cycling, handball and basketball.

Table 5: Post hoc comparison of adjustment means of anaerobic group of weight lifting, wrestling, swimming and 100 m players in relation to proteins, carbohydrates, fats, and calories.

Variable	Weight L Vs Wrestling	Weight L Vs Swimming	Weight L Vs 100 M	Wrestling Vs Swimming	Wrestling Vs 100 M	Swimming Vs 100 M
Proteins	11.08	6.68	-23.48	-4.40	-34.56000*	-30.16000*
Carbohydrates	-44.32000*	-28.60	-14.84	15.72	29.48	13.76
Fats	-65.92000*	0.52	-31.80	66.44000*	34.12000*	-32.32000*
Calories	-700.48000*	-95.72	-461.76000*	604.76000*	238.72	-366.04000*

* Significant at 0.05 level of significance

Table 24 shows comparison of proteins, carbohydrates, fats, and calories between weight lifting, wrestling, swimming and 100 m players. It was observed that mean values of proteins showed significant difference between wrestling and 100 m. Whereas carbohydrates showed a significant difference between weight lifting and wrestling. Fats showed significant difference between weight lifting and wrestling, wrestling and swimming, wrestling and 100 m, swimming and 100 m. Calories showed significant difference between weight lifting and wrestling, weight lifting and 100 m, wrestling and swimming, swimming and 100 m.

Discussion of Findings

Purpose of the present study was to find out the nutritional patterns of aerobic capacity players, anaerobic capacity players and significant difference in nutritional pattern between aerobic and anaerobic capacity players. The present investigation has been conducted 240 male players including aerobic players of handball, football, basketball, cycling and male anaerobic players of weightlifting, wrestling, swimming and 100mts. running only. The players under investigation will consist of those who will take part in all India Interuniversity level. The subject will be selected from the states of North Zone including Punjab, Haryana, Chandigarh, Himachal Pradesh, Delhi. The study will be conducted on male players ranging age 18-25 years.

There was significant difference in proteins, carbohydrates, fats, and calories between aerobic and anaerobic groups. ANOVA revealed significant differences in proteins, carbohydrates, fats, and calories among mean values of aerobic group of handball, football, cycling and basketball players and significant differences in proteins, carbohydrates, fats, and calories among mean values of anaerobic group of weight lifting, wrestling, swimming, and 100 m players. In the

aerobic group the Mean values of proteins showed significant difference between football and handball, football and cycling, football and basketball, handball and cycling, cycling and basketball. Whereas carbohydrates showed a significant difference between football and cycling, handball and cycling, handball and basketball. Fats showed significant difference between football and handball, football and cycling, football and basketball, handball and basketball, cycling and basketball. Calories showed significant difference between football and cycling, football and basketball, handball and cycling, handball and basketball. While in the anaerobic group the carbohydrates showed a significant difference between weight lifting and wrestling. Fats showed significant difference between weight lifting and wrestling, wrestling and swimming, wrestling and 100 m, swimming and 100 m. Calories showed significant difference between weight lifting and wrestling, weight lifting and 100 m, wrestling and swimming, swimming and 100 m.

References

1. Ackland TR, Lohman TG, Sundgot- Borgen J, Maughan RJ, Meyer NL, Stewart AD *et al*. Current status of body composition assessment in sport; Sports Med. 2012; 42(3):227-49.
2. Armand Bettonviel EO, Naomi Brinkmans YJ, Oliver Witard C. Nutritional Status and Daytime Pattern of Protein Intake on Match, Post-Match, Rest and Training Days in Senior Professional and Youth Elite Soccer Players. International Journal of Sport Nutrition and Exercise Metabolism. 2016; 26(3):285-293.
3. Bandyopadhyay A. Anthropometry and body composition in soccer and volleyball players in West Bengal, India. Journal of physiological anthropology. 2007; 26(4):501-505.
4. Battinelli. Indian Journal of Science and Technology Research article Anthropometry of Indian athletes George Abraham. ISSN: 0974- 6846. 2010, 3(12).
5. Brad Jon Schoenfeld, Alan Albert Aragon, Colin D Wilborn, James W, Krieger Gul T Sonmez. Body composition changes associated with fasted versus non-fasted aerobic exercise. Journal of the International Society of Sports Nutrition; Pub. Nov, 18, 2014, 2014.
6. Claudia Juzwiak R, Olga MS, Amancio, Maria SS. Vitalle, Marcelo Pinheiro M, Vera L. Szejnfeld Body composition and nutritional profile of male adolescent tennis players; General of sports science. 2008; 26:1209-1217.
7. Dr. M Sooriyanarayanan1, Dr. K. Effects of Anaerobic and Aerobic Training on Overall Playing Ability Performance of Collegiate Football Players. International Journal of Recent Research and Applied Studies. 2014; 1:6(5).
8. Gopinathan P, Helina G. Correlation of selected anthropometric and Physical fitness variables to handball performance. Journal of sports and sports sciences. 2009; 32(1):25-30.
9. Helen Javandel, Farzad Berahmandpour. Effects of nutrition patterns in soccer players. Journal of Sports Science and Medicine, Suppl, 2007, 10.
10. Marcella Malavolti1, Marco Poli1, Angelo Pietrobelli, Manfredo Dugoni1, Ornella Trunfio, Nino C. Battistini Body composition and nutritional habits in professional ballet dancers. International Journal of Body Composition Research. 2005; 3(2):69-72.
11. Sallinen J, Ojanen T, Karavirata L, Ahtiainen JP, Hakkinen K. Muscle mass and strength, body composition and dietary intake in master strength athletes vs untrained men of different ages. The Journal of Sports Medicine and Physical Fitness 2008; 48(2):138-42.
12. Souglis AG, Chryssanthopoulos CI, Travlos AK, Zorzou AE, Gissis IT. The effect of high vs. low carbohydrate diets on distances covered in soccer. J strength Cond Research. 2013; 27(8):2235-47.
13. Williams C, Rollo. Carbohydrate Nutrition and Team Sport Performance. Sports Medicine, 2015; 45(1):13-22.