









while demonstrating a lack of application of their knowledge to their current dietary habits. About 90% of the sports person did not meet the RDA for all the macronutrients (proteins, carbohydrates, or fats), and many were outside of normal ranges for calcium, iron, and zinc consumption [20].

#### 4.2.5 Dietary Practices Pertaining to Sports Activities

**Table 6:** Dietary Practice of the Selected Sports person  
N=100

S. No.	Particulars	Per cent(%) of Sports person
1	<b>Carbohydrate loading before event</b>	
	Always	22
	Occasionally	35
	Rarely	43
2	<b>Restriction of Fat Intake</b>	
	Always	22
	Occasionally	41
	Rarely	37
3	<b>Water Intake Per day</b>	
	6-8 glasses	18
	8-10 glasses	23
	>10 glasses	59
4	<b>Consumption of Sports Drink</b>	
	Always	3
	Occasionally	2
	Rarely	95
5	<b>Electrolyte consumption</b>	
	Always	36
	Occasionally	2
	Rarely	62
6	<b>Mode of Consumption of electrolyte</b>	
	Mixed with water	36
	Mixed with soda	1
	Powder Form	1
7	<b>Ergogenic aid</b>	
	Yes	11
	No	89

Table 6 shows the dietary practice of the sports person. Only 22 per cent of the selected sportsperson had the habit of carbohydrate loading before the event, while 35 per cent followed it occasionally and 43 percent rarely followed carbohydrate loading. Twenty two per cent of the sports person restricted fat intake always while 37 per cent did not restrict. Fifty-nine percent of sports person consumed more than ten glasses of water per day, 23 percent consumed 8-10 glasses and 18 per cent consumed 6-8 glasses/day. It was surprising to note that 95 percent of sports person did not consume the sports drink. The data regarding electrolyte consumption shows that 36 percent of sports person always consumed electrolytes while two percent were consuming occasionally. On analyzing the mode of consumption of electrolyte, most of the sports person consumed with water while 2 percent mixed with soda and in powdered form. It was heartening to note that 89 per cent of the sports person did not consume any ergogenic aid.

#### 4.3 Sports Profile

**Table 7:** Sports Profile of the Selected Sports person  
N=100

S No	Particulars	Per Cent of Sports person
1	<b>Type of Sport Involved</b>	
	Athletic Event	11
	Group event	89
	Cricket	14
	Foot ball	14
	Hockey	13
	Kho-kho	3
	Kabady	13
	Hand ball	5
	Basket ball	9
	Volley ball	18
2	<b>No of Years Engaged in Sports</b>	
	< 5 Yrs	25
	5-10Yrs	52
	>10Yrs	23
3	<b>Duration of Practice</b>	
	Up to 1 hr	39
	1-2 hrs	15
	2-3 hrs	46
4	<b>Practice Session</b>	
	Only Morning	5
	Only Evening	4
	Both Morning and Evening	91
5	<b>Meritorious Achievement</b>	
	College level	15
	Inter university level	35
	District Level	20
	State Level	7
	National Level	3
6	<b>Serious Injury while playing</b>	
	Yes	17
	No	83

The Table 7 shows majority (89%) of sports person were involved in group event, in which 18 per cent of sports person were volley ball players, 14 per cent each were involved in foot ball and cricket and 13 per cent each in hockey and kabadi. Three and five percent of sports person were playing kho-kho and hand ball respectively. Majority (52%) of the selected sports person were involved in sports for the past 5-10 years and 46 percent practiced for 2-3 hours a day. Ninety one percent of sports person practiced both in the morning and evening session. Thirty five of the sports people were inter university level achievers and three percent national level achievers. Majority (83%) of the sports person did not have serious injury while playing.

#### 4.4 Nutrition Education

**Table 8:** Impact of Nutrition Education on the Nutrition knowledge of Selected Sports person  
N=20

Score before education Mean $\pm$ SD	Score after education Mean $\pm$ SD	't' Value	Significance
7.75 $\pm$ 3.52	15.35 $\pm$ 4.43	4.2	**

\*\* Significant at one percent level

Athletes received most of their nutritional knowledge from parents, coaches, and peers, yet many athletes' knowledge bases were lacking and incorrect[21] [22]. This lack of

accurate information may lead to an increased chance of athletes developing one or more aspects of the female athlete triad due to poor food choices and the resultant nutritional inadequacies mentioned previously [20].

Table 8 shows the information about nutrition knowledge of selected sports person. Mean score before nutrition education was  $7.75 \pm 3.52$  while after imparting the nutrition education, the mean score increased to be  $15.35 \pm 4.43$ . Statistical t test showed that there was a significant difference in the nutritional knowledge of sports person before and after education.

## 5. Discussion

### 5.1 Demographic Information

The decision to participate in sports is affected by a wide range of demographic and socio economic factors. Statistics shows that female sports do not carry the same weight as male sports. Of the 100 sports person included in the present study, only 12 per cent were females.

Not surprisingly, sports participation tends to be lower among older people and higher among younger people. The data of this study suggests that a proportion of young people reduce activity levels around mid twenties to late thirties.

India is one of the most religiously diverse nations in the world and religion still plays a central and definite role in the life of many of its people. Despite its secular nature, Hindus outnumbered other religions.

Participation in sports and recreation varies by household type. Sports person from nuclear family are more likely to participate in sports activities than joint family.

Habits like smoking, tobacco and alcoholism tend to produce both short term and long term effect on sports performance. About 60 per cent of the selected sports person were aware of it and did not have these habits.

### 5.2 Nutritional Assessment

#### 5.2.1 Anthropometric Measurement

The mean height and weight of both male and female sports person was significantly lower than NCHS as evident from the table. This shows that the intake of nutritious food during their growth period has been inadequate. Previous researches with the BMI standards among athletes indicate 32 percent of the athletes were overweight; 17 percent were obese. Twenty-five percent of adult males and 73 percent of adult females had a high risk waist circumference. Athletes at high risk for obesity-related diseases were referred to their primary physician for follow up [23]. In concordance with the above study, both male and female participants had mean height and weight lower than NCHS standards. In contrary to the above study, the more than half of the selected sports person were underweight.

#### 5.2.2 Blood Hemoglobin Levels

Hemoglobin is used by the red blood cells to deliver oxygen and remove carbon di oxide from an athletes' exercising

muscle. The biological significance of O<sub>2</sub> transport by Hb is well-illustrated by anemia where decreased Hb also decreases exercise performance despite a compensatory increase in cardiac output [24] [25]. In the present study majority (60 per cent) were anemic. Several investigators have proposed mechanisms by which iron balance could be affected by intense physical exercise [26] [27] [28] [29]. Explanations include increased gastrointestinal blood loss after running and hematuria as a result of erythrocyte rupture within the foot during running. The possibility of increased red cell turnover in athletes is supported by the ferrokinetic measurements conducted by Ehn [30] et al who demonstrated that the whole-body loss of radioactive iron occurred  $\approx 20\%$  faster in female athletes than in nonathletes, and both were faster than that in adult men.

#### 5.2.3 Dietary Practices

Results about fast food consumption revealed that 25.49% of the participants ate fast food only once a day and 4.58% of the participants did not eat in the past seven days. These numbers are surprising considering the prevalence of fast food in today's world. Eating fast food only one time in a week is not a poor choice when considering that some fast food choices may actually be healthy [31].

Buergel's [32] study indicated that only 41 per cent eat breakfast, while Hickson [33] study indicated that only 19 per cent of his sportsmen ate breakfast compared with the present study where 85 per cent sports person consumed breakfast.

One study indicated that 77.5% of participants ate junk food daily and the majority consumed junk food several times a day [34]. In the present study, almost all participants had preference for junk foods and 54 per cent preferred bakery items. The data is not surprising considering the prevalence of fast food in today's world.

#### 5.2.4 Food and Nutrient Intake

Results of the present study shows that the selected participants are not getting recommended servings of GLV, other vegetables and fruits which strongly reflects on the deficiency of mineral and fiber intake.

Other research by Ousley-Pahnke et al [22], Hawley et al [35] and Barbara et al [20] demonstrated energy deficits present among female swimmers which may be followed by a decrease in performance. Hassapidou et al [36] asserts that the presence of this unbalanced diet leads to sub-maximal performance in the female swimmer. Deficit energy intake accompanied with unbalanced intake of nutrients will definitely have an impact on the performance of the participants of the study.

Calcium is a very important mineral needed for strong healthy bones. Besides, it helps in muscle contraction and relaxation, blood clotting and neuro transmission. Some athletes see their cramps disappear by boosting their diet with foods rich in calcium [37]. Inadequate intake of calcium can be big health risk for participants of the present study now and in the future.

Iron is another critical micro mineral which can impose sports anemia affecting performance. Iron deficiency anemia will slow even the fittest and best conditioned endurance athlete[37]. For men and women who engage in regular, endurance exercise there is a greater loss of iron. In addition, decreased iron stores have been documented in athletes because iron has a shorter half life in these individuals. A conservative estimate is that athletes need 30% more iron than individuals who do not exercise [38].

Previous studies indicate that more than 50% of female swimmers do not meet the recommended dietary allowance (RDA) for iron or calcium[39] [40]. Nutrient intake of elite athletes is a critical determinant of their performance and ability to compete. The nutrient intake shows significant variation with respect to sports discipline and body weight. The nutrient intake of the sportsmen was well comparable with RDA expect for protein and iron[31] in contrary to the present study where there was a deficit intake of almost all nutrients.

### 5.2.5 Diet Practices pertaining to sports activity

In the present study only 22 per cent of participants had the habit of carbohydrate loading before event. Increased dietary carbohydrate intake can result in enhanced endurance exercise performance by increasing muscle glycogen stores[41], but may not in all instances as displayed by Burke et al. [42].

While only 22 per cent restricted their fat intake in the present study, reviews suggest that if an athlete eats an increase in fat and does not consume adequate carbohydrates, the fat cannot be easily used as energy in the body and protein will be used, resulting in muscle breakdown. [43]

Fluid loss during strenuous, long duration exercise is commonplace and can result in thermal stress, impaired cognition and cardiovascular function, accelerated fatigue, and impaired exercise performance[7], [44]. Recommendations for fluid intake before, during, and following exercise are well described [45] [46] and are typically followed by most athletes seeking enhanced physical performance. Abiding by such recommendations appears particularly important when exercising in hot and humid environmental conditions, where fluid loss may be high[47]. Good hydration trend was observed among the selected participants.

It is saddening to note that consumption of any type of sports drink is uncommon among the selected participants. However, before looking in for supplements for a boost, a smart sports diet and a sound training program should be in place[37].

Apart, electrolyte consumption was very rare among the selected sports person. Electrolyte supplementation improves taste, stimulate thirst response and minimize dehydration [48].

Ergogenic aids (from the Greek, ergon, meaning work) are ingested to enhance energy utilization in athletes. In recent years there has been an increase in youth participating in

competitive sports and, as a consequence, a concomitant increase in the usage of performance enhancing substances. Ergogenic aid usage could influence, or its efficiency could be influenced, during this period of rapid growth and sexual maturation, and by the marked hormonal fluctuations. Ephedra alkaloids; pain relief medications, diuretics, anabolic steroids and protein hormones are among the ergogenic aids used by young athletes[49]. In contrast, majority (89 per cent) of the selected sports persons in the present study did not consume any ergogenic aids.

Consuming adequate food and fluid before, during, and after exercise can help maintain blood glucose during exercise, maximize exercise performance, and improve recovery time. Athletes should be well-hydrated before beginning to exercise; athletes should also drink enough fluid during and after exercise to balance fluid losses. Consumption of sport drinks containing carbohydrates and electrolytes during exercise will provide fuel for the muscles, help maintain blood glucose and the thirst mechanism, and decrease the risk of dehydration or hyponatremia[50].

Awareness need to be created among the sports person to improve electrolyte consumption and ergogenic aid consumption.

### 5.3 Sports Profile

Volley ball is the event played by majority of the selected subjects. Having its origin in United States back in 1895, the sport was officially included in the program for the 1964 Summer Olympics. It is a sport played all over India, both in rural as well as urban India. It is a popular recreation sport. India is ranked 5th in Asia, and 27th in the world. Doing well in the youth and junior levels, India came in second in the 2003 World Youth Championships. Currently, a major problem for the sport is the lack of sponsors. The Indian senior men's team is currently ranked 30th in the world.

Cricket and football are the group events played by majority of participants next to volley ball. Cricket was first played in southern England in the 16th century. By the end of the 18th century, it had developed to be the national sport of England. The expansion of the British Empire led to cricket being played overseas and is one of a commonly played game in India. Football is India's second most popular sport, next to the game of cricket. India's current top domestic league, I-League, was formed in 2007 in an attempt to professionalize domestic football. The 2017 FIFA U-17 World Cup is scheduled to take place in India.

Although hockey being the national game of India, very few people show interest when compared to other games. Indian hockey has lost a bit of identity as a national sport although it is considered to be an intrinsic part of the culture of a nation. Indian Hockey Federation has to search for the new talent and should work on them to make them good players so that they can compete in big events like Olympics. Kabbadi originated from Tamil Nadu and is played in various parts of India like Karnataka, Andhra Pradesh, Punjab and Maharashtra. Since kabbadi is a local game, some of the selected sports person is involved in this game

Basket ball, hand ball and kho kho were also played by few of the selected participants. Nearly half of the selected participants were involved in the sports for 5 – 10 years and practiced 2 – 3 hrs a day. However, meritorious achievement data showed only a few sports person succeeded in state and national level competitions. The availability of infrastructure, proper coaches, motivation and financial support were the reasons to help and support the sports people in their respective field and achieve their goals.

#### 5.4 Nutrition Education

Athletes, coaches, athletic trainers (ATs), strength and conditioning specialists (SCSSs) have busy schedules; therefore, an expert in nutrition (eg, an RD (Registered Dietitian), if available) needs to develop a working relationship with the athletic staff and provide education and counseling about food and nutrition [51]. Overall, participants had just below-average nutrition knowledge for all domains. The findings regarding the overall nutrition knowledge of ATs are similar to those of previous investigations [39] [52] [53]. A short – term nutritional education program can significantly improve supplementations knowledge [54]. In accordance with the above study, the participants of the present study showed a significant improvement in the nutritional knowledge after a short term nutrition education programme.

#### 6. Conclusion

The participants of the present study had a below average nutritional status. The reason may be poor nutritional knowledge which is reflected in their nutrient intake. Nutrition education has definitely created awareness among the selected sports person which would in long run help improve their nutritional status.

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