"DIETARY PATTERN AND WORKOUTS PERFORMED BY COLLEGE ATHLETES "

PROJECT SUBMITTED

In Partial Fulfilment of the Requirement for the Award of the degree of

B.Sc. NUTRITION AND DIETETICS

BY

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DEPARTMENT OF CLINICAL NUTRITION AND

DIETETICS

ST. TERESA 'S COLLEGE (AUTONOMOUS)

ERNAKULAM

APRIL 2023

CERTIFIED AS BONAFIDE RESEARCH WORK

Signature of Internal Examiner **Signature of External Examine**

DECLARATION

I hereby declare that the project entitled **"DIETARY PATTERN AND WORKOUTS PERFORMED BY COLLEGE ATHLETES"** submitted in partial fulfilment of the requirement for the award of the degree of B.Sc. Nutrition and Dietetics is a record of original research work done by me under the supervision and guidance of **Ms. Elizabeth Varghese Anthikkat** Assistant Professor, Department of Clinical Nutrition and Dietetics, Women's Study Centre, St. Teresa's College (Autonomous), Ernakulam and has not been submitted in part or full of any other degree/diploma/fellowship or the similar titles to any candidate of any other university.

Place:

Date:

CERTIFICATE

I here certify that the project entitled **"DIETARY PATTERN AND WORKOUTS PERFORMED BY COLLEGE ATHLETES"** submitted in partial fulfilment of the requirement for the award of the degree of B.Sc. Nutrition and Dietetics is a record of original work done by **Ms. AYSHA HANAN C.Y** during the period of the study under my guidance and supervision.

Signature of the HOD with designation

Signature of the Research Guide

ACKNOWLEDGEMENT

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INTRODUCTION

Nutrition composition plays a crucial role in athletic performance, specifically, the type and amount of macronutrients, as well as the timing of consumption before and after workouts. Not all athletes optimally consume macronutrients. The three macronutrients, carbohydrates, protein, and fat, all perform different roles in the body, whether it is for

energy, recovery, or to maintain body functions.The body will use carbohydrates or fats as the main energy source, depending on exercise intensity and duration. Inadequate caloric intake can impede athletic training and performance. Resistance training programs are designed to gradually build the strength of skeletal muscle. Strength training is high-intensity work. It requires sufficient amounts of all macronutrients for muscle development. Research findings indicate the right food type, caloric intake, nutrient timing, fluids, and supplementation are essential and specific to each individual.

According to research, target carbohydrate consumption for endurance athletes ranges from 6g to 10g per kilogram of body weight per day. Protein intake is especially vital to increase and maintain lean body mass. Research indicates protein requirements can vary from 1.2g to 3.1g per kilogram of body weight per day. Preparing for a competitive sport will vary in sports nutrition requirements. For example, strength athletes strive to increase lean mass and body size for their sport. Endurance runners focus on reduced body weight/fat for peak body function during their event. Adequate hydration and electrolytes are essential for health and athletic performance. Athletes lose additional body water (and a significant amount of sodium) sweating during intense workouts. Athletes are recommended to use fluid replacement strategies as part of their sports nutrition to maintain optimal body functioning. Rehydration with water and sports drinks containing sodium are often consumed depending on the athlete and sporting event. Athletes use some supplements and foods to enhance performance. Sports food includes sports drinks, bars, and gels, electrolyte supplements, protein supplements, liquid meal supplements. Medical supplements include iron, calcium, vitamin D, multi-vitamin/mineral, omega-3 fatty acids. Performance supplements include creatine, caffeine, sodium bicarbonate, beta-alanine, nitrate. Most common micronutrient deficiencies that may seen in athletes include Iron deficiency can impair muscle function and compromise athletic performance Vitamin D deficiency can result in decreased bone strength and reduced muscle metabolic function and Calcium deficiency can impair the repair of bone tissue, decrease regulation of muscle contraction, and reduce nerve conduction. Some athletes take supplements to overcome these deficiencies.

The studies regarding the topic "Dietary patterns and workouts performed by college athletes" are very less especially in Kerala. Many athletes didn't have an idea about sports nutrition and its importance. The aim of this study is to assess the knowledge of athletes about the diet needed for sports, to assess workouts they perform, and to assess if athletes were doing any training based on their sports. We also assessed athletes daily hydration status and supplement intakes. The objectives of this study are use of energy drinks, dietary supplements and medications by athletes, macronutrients and micronutrients intake, pre and post workout.

REVIEW OF LITERATURE

USE OF ENERGY DRINKS BY ATHLETES.

Hoyte et al. (2013) explored the use of Energy Drinks, Dietary Supplements, and Prescription Medications for the enhancement of athletic performance among college

students using a multi-round online questionnaire. The survey was done by asking subjects if they used any Energy Drinks, Dietary Supplements, and Prescription Medications to enhance athletic performance within the last year. 462 college students had taken part in the survey, those who had responded to the survey reporting they participate in sports at various levels. Results found that out of 462 students 397 (85.9%) responded they used energy drinks, dietary Supplements and prescription medications. Energy drinks had the highest prevalence (80.1 %), followed by dietary supplements (64.1 %) and prescription medications (53.3 %) and all its use was most prevalent amongst intercollegiate athletes (89.4 %) followed by club (88.5 %) and intermural (82.1 %) participants.

Dariusz Nowak et al. (2016) conducted a study to analyze the consumption of Energy drinks among teenagers engaged in the sports and also they collected data about the quantity consumed, identification of factors influencing the consumption, and risks associated with energy drinks and energy drinks mixed with alcohol. The data had been collected through a specially designed questionnaire and the questionnaire had been completed by 707 students who were attending secondary sports schools. The result shows that 69% of young athletes had energy drinks. 17% of them consume energy drinks quite often : every day or 1 to 3 times a week. Most of the subjects didn't feel any effects after drinking energy drinks, but some reported symptoms like insomnia, anxiety, tachycardia, nervousness and irritability. The major factors for the choice of energy drinks were taste (47%) and by price (21%). One in ten respondents had consumed energy drinks mixed with alcohol and the consequences reported by them are abdominal pains, nausea, vomiting, amnesia, headache, and hangover.

Andrew R Gallucci et al. (2016) conducted a survey to assess the energy drink consumption, potential energy drink correlates and Energy drinks related motivations among a sample of college students to determine based on athlete status (student athlete vs Non-athlete). The survey was completed by 692 college students (between ages of 18 to 25) and participants had completed a paper based questionnaire. Results show over 36% of participants had reported consumption of energy drinks in the preceding 30 days. Based on the athlete status there was no difference in energy drink consumption. Energy drink motivations are different based on the frequency of Energy drink consumption. Survey shows that the use of energy drinks among student athletes and non-athletes are common.

USE OF DIETARY SUPPLEMENTS AND MEDICATIONS BY ATHLETES.

Froiland et al.(2004) conducted a survey to examine the source of information and usage of nutritional supplements among 115 male and 88 female varsity athletes. For conducting surveys each athlete is asked to define supplements, and report supplement use and type, source of information, and reasons for use. The participants' comparisons were made between gender and sport. 89% of participants used nutritional supplements. Many athletes didn't consider sports Drinks and calorie replacement product supplements. The most frequently used supplements overall by the participants were energy drinks (73%), Calorie replacement products of all types (61.4%), Multivitamin (47.3%), Creatine (37.2%), and vitamin C (32.4%).Females were more likely to obtain information from family members regarding supplementation and males from a store nutritionist, fellow athletes, friends or a coach.

Huang et al. (2006) carried out research to learn more about the prevalence of dietary supplement and medication use by Canadian athletes in the Olympic Games in Atlanta 1996 and Sydney 2000. They collected data through personal interviews. The athletes were interviewed by Canadian physicians regarding the use of vitamins, minerals, nutritional supplements, and prescribed and over- the- counter medications. 257 athletes who participated at the Atlanta Olympics and 300 Canadian athletes who participated at the Sydney Olympics were interviewed. The athletes used some kinds of dietary supplements. Vitamins were taken by 59% of men and 66% of women in Atlanta, and 65% of men and 58% women in Sydney. Mineral supplements were used by 16% of men and 45% of women in Atlanta, and 30% of men and 21% of women in Sydney. Nutritional supplements were used by 35% of men and 43% of women in Atlanta, and 43% of men and 51% of women in Sydney. The most popular vitamins were multivitamins in both Olympics. The most commonly used nutritional supplement in Atlanta was creatine (14%) and in Sydney was amino acids (15%). Nonsteroidal anti-inflammatory drugs were the most commonly used medication in both Olympic Games.

Sato et al. (2012) carried out research to investigate supplement use among Japanese elite athletes. A cross sectional survey study using individual interviews during athletes medical evaluations is conducted for collecting data. 552 Japanese athletes for the London Games were the subjects. All subjects were interviewed by pharmacists regarding supplement use. Out of 552 athletes 452 (81.9%) athletes used one or more supplement products in the year before the study. The most commonly used supplement was amino acids. The most common purpose for supplement use was recovery from fatigue. Regarding athletes' information sources on supplements, coaches, managers, and trainers were the most frequent advisors.

Akiko Sato et al. (2012) conducted a survey to investigate the prevalence of supplement use among young elite Japanese athletes. Subjects for the study were 75 athletes who were selected for the Japanese national team. The data were collected through individual interviews. Results showed 47 (62.7%) had used one or more supplement products. The mostly used supplement was amino acids and it is used by 33 athletes. 39.5% participants were taken to enhance recovery from fatigue, whereas 22.1% were used to improve athletic performance and statistical analysis shows that there is no significant relationship between supplement use and attitudes toward a balanced diet.

Silva et al. (2010) performed a study to evaluate the use of dietary supplements in athletes. The participants of the study were 113 national level athletes (age 15-35 yr) in Sri Lanka. Dietary supplementation practices of participants were assessed. Data was assessed through an anonymous questionnaire by an interviewer. Questionnaire provides information on the number of supplements taken, frequency of use, nature of product, rationale, sources of advice, and reasons for taking supplements. 94% of participants consumed dietary supplements. On average, 3.7 products were consumed per day. Footballers had significantly lower intake of supplements than other athletes and they also consumed fewer products per day. Popular supplements used by participants are multivitamins, vitamin E, calcium, energy foods and drinks, and creatine. Results drawn from this study shows that multiple supplement use was common among national level Sri Lankan athletes. The athletes got advice on supplement use from sports doctors (45%), team coaches (40%), or friends (15%). 79% of participants took supplements to improve performance, and 19% participants took supplements to improve their overall health status.

MICRONUTRIENTS REQUIREMENTS FOR ATHLETES

Garvican et al. had conducted a study to assess the efficacy of intravenous Iron supplementation (ferric carboxymaltose) compared with oral supplementation (ferrous sulfate) on iron status, hemoglobin mass and physiological indices of running performance in distance runners. Subjects of this study were 27 highly trained distance runners with the low or suboptimal iron status. They were supplemented with either IV iron or oral supplements for six weeks. The subjects were categorized into four groups (IV LOW, IV SUB, ORAL LOW AND ORAL SUB) and the subjects iron status and hemoglobin mass were assessed before supplementations and at 1, 2, 4, 6 and 8 weeks and also the athletes Completed a treadmill running test for running economy, lactate threshold, and V O 2max before and after supplementation. The both forms of supplementations had substantially increased ferritin levels in all four groups. IV supplementations resulted in higher ferritin when compared with oral groups from the first week onwards and hemoglobin concentration did not change substantially in any group. Hemoglobin mass increased in IV LOW and was accompanied by an increase in VO2Max and run time to exhaustion.

In the year 2019 *wrzosek et al.* had carried out a research to assess the calcium and vitamin D supply in a diet among women regularly practicing sport. The subjects of the research are 593 women at the age of 18-50 who played sports regularly (at least 2 times a week). The tool used for collecting data is a short Food frequency questionnaire for calcium and vitamin D (VIDEO-FFQ) and it is provided to the subjects via social media and also the authors applied a group based cut-off point method. The result drawn from the research shows that the median of calcium and vitamin D intake in a diet was 502 mg/day respectively. 92% of the examined participants in a group demonstrated lower than recommended calcium intake levels and 97.3% showed lower than recommended vitamin D intake levels. After including Calcium and vitamin D intake, the supply medium for the whole group was 535 mg per day. In the examined participants 87.5% did not meet the EAR norms for calcium and 42% did not met the AI norm of vitamin D. Among the women supplementing calcium 58.9% did not reach the reference intake value however, all women supplementing vitamin D fulfilled the expected nutritional need.

Hildebrand et al. (2016) had conducted research to determine the vitamin D status of Collegiate athletes residing in the southern US and its effects on muscular strength and anaerobic power. Collegiate athletes from three separate NCAA athletic programs had been recruited as subjects. To determine the Influence of vitamin D status on muscular strength and anaerobic power the anthropometric, Vitamin D and calcium intake, and sun exposure data were collected along with the serum 25-OH D and physical performance measures. The result from the study shows approximately 68% of the study participants are vitamin D adequate, 23% are insufficient and 9% predominantly non- Caucasian athletes, were deficient and also the subjects having lower vitamin D status had reduced performance scores. To optimize the muscular strength and power of athletes, maintaining adequate vitamin D status may be important.

Alimoradi et al. (2019) performed this study to determine vitamin D status and to evaluate the efficacy of weekly vitamin D supplementation on athletic performance in Iranian athletes expedited to Asian competition in Taipei, China, 2015. This study was conducted through a randomized controlled clinical trial. Subjects of this study were 70 national football and Futsal athletes (18 to 23 years old). 34 women (47.8%) and 36 men (52.2%) are randomly divided into 2 groups; Vitamin D supplement (D; received 50,000 IU of vitamin D supplement weekly) and control (P; received a placebo weekly). 8 weeks is the

duration of the interventional period. At the beginning and in the end the subjects anthropometric, dietary, athletic performance, and biochemical evaluations were performed. This study shows that a significant rise in circulating 25(OH) D concentration was observed in the D group whereas, in the P group, there was a statistically significant decrease and in strength leg press tests, both the groups had shown a significant improvement. The comparisons of changes revealed that the improvement in the D group was higher than in the P group.

The effects of vitamin D3 supplementation on physical performance during winter training in vitamin D insufficient taekwondo athletes had been investigated by Hyun *Chul Jung et al.* in 2018. The subjects were 35 collegiate male and female taekwondo athletes, aged 19-22 years with low serum 25(OH)D concentration are randomly assigned to a vitamin D group or a placebo group. Vitamin D3 capsule (5,000 IU/day) or a placebo were given to participants. For analysing serum 25(OH)D concentration the blood samples of subjects were collected and physical performance tests were done. Serum 25(OH)D concentrations increased significantly in the vitamin D group after 4 weeks of supplementation, but no changes were found in the placebo group. The result shows that the vitamin D supplementation for 4 weeks will elevate serum 25(OH) D concentration to sufficient levels.

Gropper et al. (2003) conducted a study on the topic 'Copper status of collegiate female athletes involved in different sports'. The purpose of this was to examine indices of copper status, serum copper, and ceruloplasmin concentrations. The subjects were 70 female collegiate athletes (18 to 25 years) and a group of 8 college-aged females (20 to 23 years of age), who were not collegiate athletes, served as controls. In this study a cross sectional assessment was done. Among controls and athletic teams the mean copper intake including supplements didn't differ significantly. 41% of athletes and 29% of controls failed for consuming two thirds of the RDA for copper. In the cross-sectional assessment of athletes and controls the female collegiate athletes copper status appears to be adequate.

MACRONUTRIENTS, PRE WORKOUT AND POST WORKOUT

Jeffrey et al. (2020) conducted a study to determine the self-reported beliefs and practices relating to pre-exercise nutrition intake among endurance athletes of varying ages and competitive levels. The data was collected by circulating an anonymous online survey. The revealed that prior to morning exercise, 36.4%, 36.0%, and 27.6% of athletes consumed carbohydrate-containing food/drinks before almost every workout, some of the time, and never/rarely, respectively, nutritional intake before exercise varied based on workout duration for 47.6% of athletes, based on workout intensity for 39.1% of athletes, 89.0% of athletes reported using at least some type of dietary supplement (including caffeine from coffee/tea) within 1 hour before exercise.

Martinez et al. (2016). Conducted a study to determine the acute effect of pre workout supplementation on power and strength performance. In this investigation, 13 males participated. For analyzing subject strength performance various test were performed like medicine ball put, vertical jump test, one-rep maximum bench press, and a Wingate Anaerobic Power Test and randomly assigned to ingest either a pre-workout supplement or a placebo and again complete the performance testing protocol. The result revealed that there was a significant difference in anaerobic peak power relative to the Wingate anaerobic power test and also observed for anaerobic mean power following ingestion of the supplement or a placebo in comparison to the and baseline. No significant differences

between trials were observed for upper body power, lower body power, or upper body strength.

Shoshan et al. (2021) conducted a study to determine the prevalence of protein and pre-workout supplement usage in high school football players and how many products contain banned substances or dangerous ingredients. The Institutional Review Board at San Diego State University approved this study. For this study 102 high school football players participated. For collecting the data they used an online questionnaire. From the collected data it was reported that the majority of high school football players use protein supplements, one-third use pre-workout supplements and five participants reported using a pre-workout product that contained a known NCAA banned substance.

Hill et al. conducted a study to determine the effect of pre-workout CHO on affect in swimmers. In this study 38 NCAA Division II men and women intercollegiate swimmers participated. Athlete Burnout Questionnaires were used for measuring athlete burnout and dietary information was collected once at baseline prior to study interventions to describe normal dietary habits and also 24 hr. dietary recalls were used. The results revealed that there were no additional significant correlations between kcal or CHO intake and 46 % of subjects had the practice of skipping breakfast before morning swim practice.

Schoenfeld et al. (2017) conducted a study, its purpose was to test the anabolic window theory by investigating muscle strength, hypertrophy and body composition changes in response to an equal dose of protein consumed. The subjects of the study were 21 resistance trained men recruited from a university population and the subjects were randomly assigned into 1 of 2 experimental groups. Both groups consumed a supplementation containing 25 gram protein and one gram carbohydrate. First group consumed immediately prior to the exercise and the second group consumed immediately post exercise. The results from this study shows that pre and post workout protein consumption had similar effects on all measures.

Nazni et al. (2010) conducted a study which aims to assess the nutrition knowledge, attitude and practice among the selected athletes. Selected athletes are from five different private colleges situated in Salem District, Tamil Nadu, India. A total number of 102 athletes were selected. Among 102 athletes, 32 sportsmen belong to Volleyball, 25 belong to weightlifters and 45 belong to runners. For collecting data they used The knowledge, Attitude and Practices questionnaire containing 10 questions about nutritional knowledge, 9 questions about attitude and 10 questions about dietary patterns. The sportsmen's dietary composition is also assessed. Results revealed that volleyball players had good nutrition knowledge when compared to weight lifters and 29% of runners had very good knowledge about nutrition. Regarding food consumption pattern, intake of cereals, other vegetables and milk was found to be less compared to the RDA for the athletes. Among the three, nutrient intake of the runners is high compared to volleyball and weight lifters.

METHODOLOGY

The research methodology of the present study on '**DIETARY PATTERNS AND WORKOUTS PERFORMED BY COLLEGE ATHLETES'** is discussed under the following headings.

3.1 Selection of Area

3.2 Sampling Procedure

3.3 Selection and size of the Sample

3.4 Development of Tool

3.5 Conduct of Study

3.6 Data Analysis

3.1 Selection of Area:

The selected area for study included colleges in Ernakulam district, Kerala. We had selected this area because colleges in Ernakulam district give more importance to sports. The colleges we selected include St Teresa's College, Maharaja's College, Rajagiri College and Sacred Hearts College.

3.2 Sampling Procedure:

The samples selected were randomly selected from 75 college athletes between the ages of 18 to 24 years.(Random sampling is a part of the sampling technique in which each sample has an equal probability of being chosen.)

3.3 Selection and size of the sample

The sample selected were college athletes between the ages of 18 to 24 years. The size of the sample was 75 college athletes from various colleges in Ernakulam District including St Teresa's College, Maharajas College, Rajagiri College and Sacred Hearts College.

3.4 Development of Tool

The tool we had developed was a questionnaire, a questionnaire prepared by collecting information about sports through interviewing some athletes and coaches. Questionnaire included personal data information containing items such as name, age, sex, year of study etc. Socio economic class is determined by using Kuppuswamy scale. Content areas include hydration status, usage of supplements for enhancement of performance, dietary pattern, workouts and training, duration of workout and training, contextual body image questionnaire, food frequency questionnaire, 3 day recall.

3.5 Conduct of study

Firstly we had selected a topic "Dietary pattern and workouts performed by college athletes" by referring to e books and research papers. We conducted the study on college athletes between the ages of 18 to 24 years and data were collected through questionnaires. The questionnaire link was created with the help of Google form. And it was shared in groups and individually through WhatsApp. The collected data were evaluated and analyzed in the form of graphs, pie charts, etc.

3.6 Data Analysis

The collected data from the selected sample was analyzed and presented in result and discussion. The result and discussion include tables, graphs, pie

RESULT AND DISCUSSION

The results of the study entitled " DIETARY PATTERNS AND WORKOUTS PERFORMED BY COLLEGE ATHLETES " was discussed under the following headings.

- Demographic profile
- Types of Sports performed
- Dietary patterns
- Supplement intake
- Workouts and Trainings

- Achievements and support

4.1 DEMOGRAPHIC PROFILE

Table 1 Age group of participants

SI.NO.	AGE GROUP	NUMBER OF PARTICIPANTS	PARTICIPANTS (%)
1.	17 - 18	5	6.4 %
2.	19 - 20	30	38.5 %
3.	21- 22	28	35.9 %
4.	23 - 24	15	19.2 %

The majority of the participants which makes up to 38.5% belonging to age group of 19 to 20 years. 35.9 % of the participants is belonging to the age group of 21 to 22 years. 19.2 % of participants belonging to age group of 23 to 24 years. 6.4% participants belonging to age group of 17 to 18 years.

Table 2 Gender of participants

SI.NO.	GENDER	NUMBER OF PARTICIPANTS	PARTICIPANTS (%)
1.	Female	20	24.4%
2.	Male	58	75.6%

A total number of 78 athletes participated in this survey . Out of this 58 participants were males and 20 were females, its about 75.6% and 24.4% respectively.

Table 3 Socio-economic class of participants

SI.NO.	SOCIO-ECONOMIC CLASS	NUMBER OF PARTICIPANTS	PARTICIPANTS (%)
1.	Upper	5	6.41%
2.	Upper Middle	25	32.05%
3.	Lower Middle	21	26.93%
4.	Upper Lower	27	34.61%
5.	Lower	-	-

To determine the socio-economic status, we used Kuppuswamy scale. We had accessed occupation, education and income of head of the family. By calculating the score and categorised participates into upper, upper middle, lower middle, upper lower and lower classes**.** The majority of participants are from Upper lower Class is about 34.61%. 32.05%

of participants are from Upper Middle class. 26.93% of participants are from Lower middle class. 6.41% of participants are from Upper class.

Table 4 BMI

SI.NO.	BMI	NUMBER OF PARTICIPANTS	PARTICIPANTS (%)
1.	<18.5 (Underweight)	9	11.5%
2.	18.5 – 24.9 (Normal)	45	57.7%
3.	>25 (Overweight)	14	18%
4.	>30 (Obese)	10	12.8%

Formula for calculating Body mass index (BMI) =weight in kilograms divided by height in meters squared.

By calculating BMI participants are classified into underweight, normal, Overweight and Obese. The results from the table shows that 11.5% of the participants are underweight, 57.7% of participants are normal, 18 % of the participants are overweight and 12.8 % of the participants are obese.

4.2 TYPES OF SPORTS PERFORMED

Table5 Types of Sports performed by participants

SI.NO.	TYPE OF SPORTS PERFORMED	NUMBER OF PARTICIPANTS	PARTICIPANTS (%)
1.	Powerlifting	6	7.6%
2.	Football	10	12.8%
3.	Athletics	5	6.4%
4.	Wrestling	7	8.9%
5.	Fencing	3	3.8%
6.	Hockey	3	3.8%
7.	Bodybuilding	2	2.5%
8.	Cycling	1	1.2%

9.	Weightlifting	4	5.1%
10.	Taekwondo	3	3.8%
11.	Long jump	2	2.5%
12.	Basketball	6	7.6%
13.	Volleyball	6	7.6%
14.	Sprint	1	1.2%
15.	Kabaddi	1	1.2%
16.	Baseball	4	5.1%
17.	Cricket	3	3.8%
18.	Softball	2	2.5%
19.	Throw ball	1	1.2%
20.	Karate	3	3.8%
21.	Badminton	5	6.4%
22.	Judo	1	1.2%
23.	Tug of war	1	1.2%

The majority of the participants perform football is about 12.6 %. About 8.97% of them perform wrestling, 7.6% of the participants perform powerlifting, basketball and volleyball, 6.4% of the participants perform athletics and badminton, 3.8% of them perform fencing, hockey, taekwondo, cricket and karate, 5.1% of them perform weightlifting and baseball, 2.5% of them perform sports such as bodybuilding, long jump and softball and 1.2% of them perform sports such as cycling, sprint, kabaddi, throwball, judo and thugs of war.

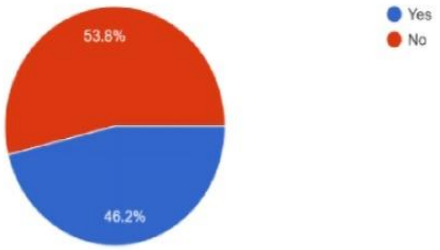
4.3 DIETARY PATTERNS

Table 6Meals consumed

SI.NO.	FREQUENCY OF MEALS CONSUMED	NUMBER OFPARTICIPANTS	PARTICIPANTS(%)
1.	Less than 3 meals	14	17.9%
2.	3 meals	32	41%
3.	3 to 4 meals	23	29.5%
4.	More than 4 meals	8	10.3%
5.	More than 5 meals	1	1.3%

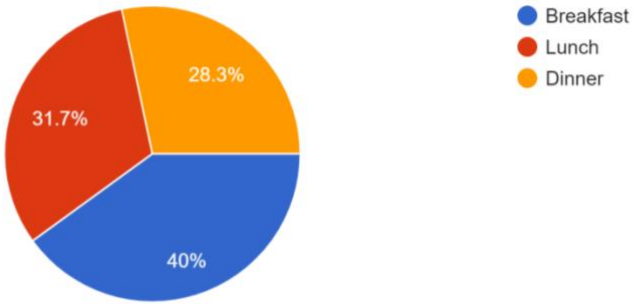
Most of the participants consume 3 meals per day (32 participants), its about 41%. 29.5% of participants consume 3 to 4 meals per day (23 participants). 17.9% of participants consume less than 3 meals per day (14 participants). 10.3 % of participants consume more than 4 meals per day (8 participants) and only 1.3% participants consume more than 5 meals per day (1 participant).

Figure1 Tendency to skip meals



According to the result drawn from the pie chart shows that 53.8% of the participants haven't the habit of skipping meals and 46.2 % of the participants have the habit of skipping meals.

Figure2 Meal generally skipped



The Majority of participants are tend to skip the breakfast, it is about 40%. 31.7% of participants had tendency to skip lunch and 28.3% of participants had tendency to skip dinner.

Table 7 Food consumption pattern

SI.NO.	FOOD CONSUMPTION PATTERN	NUMBER OF PARTICIPANTS	PARTICIPANTS (%)
1.	Vegetarian	-	-
2.	Non – vegetarian	74	94.9%
3.	Lacto – ovo - veg	3	3.8%
4.	Vegan	1	1.3%

Most of the participants are non- vegetarians, it is about 94.9%. 3.8% of participants are Lacto – ovo – veg and only 1.3% of participants are vegan.

Table 8 Water consumption

SI.NO.	AMOUNT OF WATER (in litres)	NUMBER OF PARTICIPANTS	PARTICIPANTS (%)
1.	Less than 2 litres per day	10	12.8%
2.	2 to 4 litres per day	36	46.2%
3.	4 to 6 litres per day	17	21.8%
4.	6 to 8 litres per day	11	14.1%
5.	8 to 10 litres per day	4	5.1%
6.	Above 10 litres per day	-	-

Most of the participants cconsume2 to 4 litres per day (36 participants), its about 46.2%. 21.8% of participants consume 4 to 6 litres per day (17 participants). 14.1% of participants consume 6 to 8 litres per day (11 participants). 12.8% of participants consume less than 2

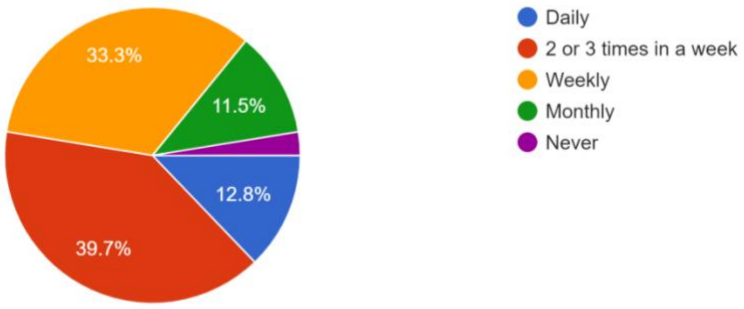
litres per day (10 participant). 5.1% of participants consume 8 to 10 litres per day (4 participants).

Table 9 Number of snack times

SI.NO.	NUMBER OF SNACK TIMES	NUMBER OF PARTICIPANTS	PARTICIPANTS (%)
1.	2 or 3 times	51	65.4%
2.	Weekly	16	20.5%
3.	Never	11	14.1%

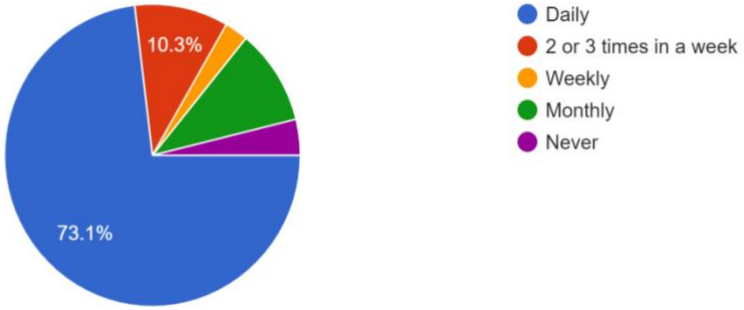
65.4% of participants consume snacks 2 to 3 times in a week. 20.5% of participants consume snacks weekly and 14.1 % of participants never consume snacks.

Figure 3 Tendency of eating out



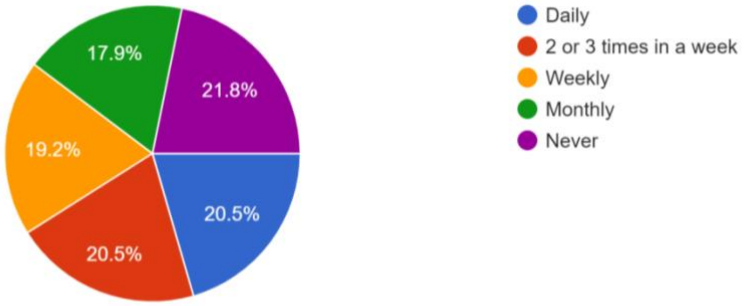
39.7 % of participants eat from outside 2 or 3 times in a week. 33.3 % of participants eat from outside weekly.12.8% of participants eat from outside Daily. 11.5% of participants eat from outside Monthly and 2.6 % of participants never eat from outside.

Figure 4 Tendency to consume home cooked food



73.1 % of participants consume home cooked foods Daily. 10.3 % of them consume home cooked foods 2 or 3 times in a week and monthly. 3.8 % of them never consume home cooked foods. 2.6% them consume home cooked foods weekly.

Figure 5 Self-cooking tendency



Majority of participants about 21.8% didn't cook for themselves. 20.5 % of participants cook Daily and 2 or 3 times in a week. 19.2% of them cook weekly and 17.9% of them cook Monthly.

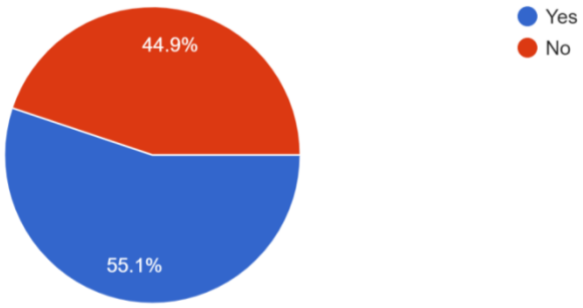
Table 10 Adherence to special diets

SI.NO.	ANY SPECIAL DIET	NUMBER OF PARTICIPANTS	PARTICIPANTS (%)
1.	Yes	28	35.9%

2.	No	50	54.1%

From the results, 54.1% of participants didn't follow any special diet and 35.9 % of participants follow special diet.

Figure 6 Participants satisfied with daily diet as adequate for their sporting activities



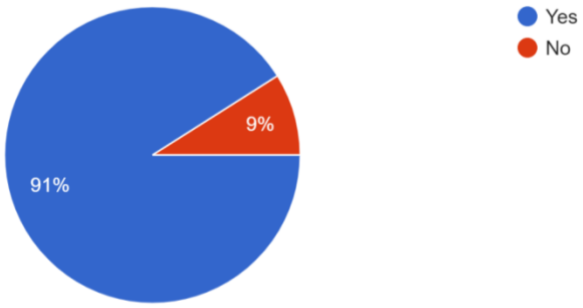
The result shows that 55.1 % of the participants are satisfied and 44.9% of participants are not satisfied with their daily diet as adequate for their sporting activities.

Table 11 Worry on nutritional aspects of diet

SI.NO.	ASPECTS OF DIET	NUMBER OF PARTICIPANTS	PARTICIPANTS (%)
1.	Adequacy of protein	22	33.8%
2.	Overall quality of diet	23	35.4%
3.	Quantity of diet	4	6.2%
4.	Food safety aspects	9	13.8%
5.	Financial issue	2	3%
6.	Bad habits	1	1.5%
7.	Other	4	6.2%

The table shows 35.4 % of participants are worried about their overall quality of diet. 33.8% of participants are worried about their adequacy of protein. 13.8% of the participants are worried about their food safety aspects. 6.2% of participants are worried about quantity of diet and other. 3% of participants are worried about their financial issue and 1.5 % of participants are worried about their bad habits of eating.

Figure 7 Belief that diet has a role in optimising performance



91% of the participants thinks that diet has a role in optimising their performance and 9% of the participants thinks that the diet has no role in optimising their performance.

Table 12 Need for expert diet advice

SI.NO.	PARTICIPANTS LIKE TO GET EXPERT ADVICE ON DIET	NUMBER OF PARTICIPANTS	PARTICIPANTS (%)
1.	Yes	43	55.1 %
2.	No	11	14.1%
3.	Maybe	24	30.8%

The table shows that 55.1% of the participants are like to get expert advice on diet to enhance their performance. 30.8% of the participants are maybe like to get expert advice on diet and 14.1% of the participants are not like to get expert advice on diet to enhance their performance.

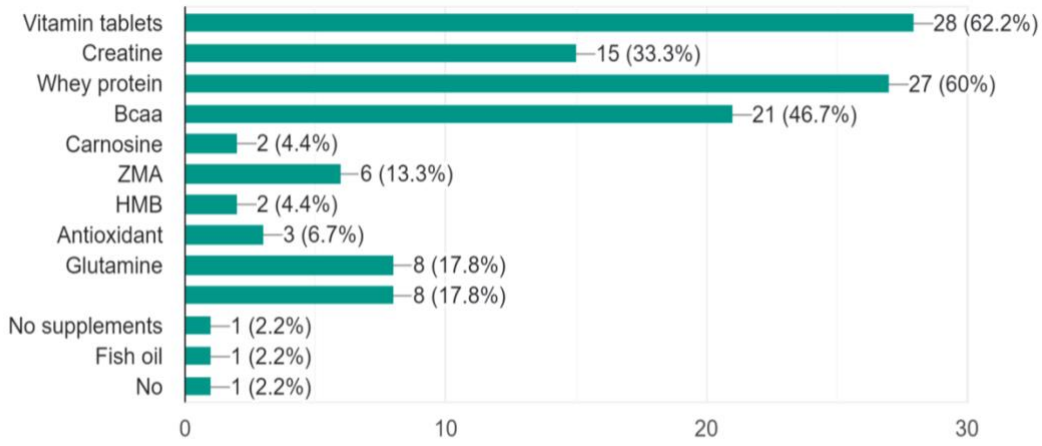
4.4 SUPPLEMENT INTAKE

Table 13 Consumption of supplements

SI.NO.	SUPPLEMENT CONSUMPTION	NUMBER OF PARTICIPANTS	PARTICIPANTS (%)
1.	Yes	32	41%
2.	No	46	59%

The Table shows that 59% of participants hadn't consume any supplements and 41% of participants had consume supplements. Most of the participants use supplements for better body performance and recovery, for strength training purpose, for muscle recovery, fat burning, for daily protein requirements etc..

Figure8 Types of supplements used



The above graph shows that majority of participants consume vitamin tablets (62.2%), then Whey protein (60%), Bcaa (46.7%), creatine(33.3%), Glutamine and other supplements (17.8%), ZMA (13.3%), antioxidants (6.7%), carnosine and HMB (4.4%) . Fish oil (2.2%) and about 2.2 % participants didn't consume any supplements.

4.5 WORKOUTS AND TRAININGS

Table 14 Tendency to workout

SI.NO.	WORKOUT	NUMBER OF PARTICIPANTS	PARTICIPANTS (%)
1.	Yes	62	79.5%
2.	No	16	20.5 %

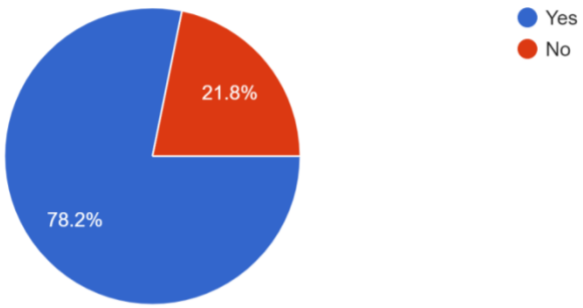
Out of 78 participants, 62 participants (79.5%) perform workouts and 16 participants (20.5%) didn't perform any workouts. Most of the participants do workout split for 6 days in a week. Some of them Daily perform workouts for fitness.

Table 15 Duration of workout (weekly)

SI.NO.	DURATION OF WORKOUT	NUMBER OF PARTICIPANTS	PARTICIPANTS (%)
1.	Less than 10 hours	35	48.6%
2.	10 to 20 hours	24	33.3%
3.	20 to 30 hours	8	11.1%
4.	More than 30 hours	5	6.9%

The table shows that 48.6% of the participants did workouts less than 10 hours weekly. 33.3% of participants did workouts 10 to 20 hours in a week. 11.1% of participants did workouts 20 to 30 hours weekly and 6.9% of the participants did workouts more than 30 hours weekly.

Figure 9 Participants under regular training



The figure shows that majority of the participants about 78.2% were doing trainings and 21.8% of participants were not doing any training.

Table 16 Timing of training

SI.NO.	TIMING OF TRAINING	NUMBER OF PARTICIPANTS	PARTICIPANTS (%)
1.	Morning	33	46.5%
2.	Evening	31	43.7%
3.	Night	7	9.9%

The table shows that most of the participants about 46.5% done their training in the morning, 43.7% of participants done their training in the evening and few about 9.9% of participants done their training in night time. The duration of training is about 1 to 2 hours, 2 to 3 hours, 3 to 4 hours and 4 to 5 hours maximum.

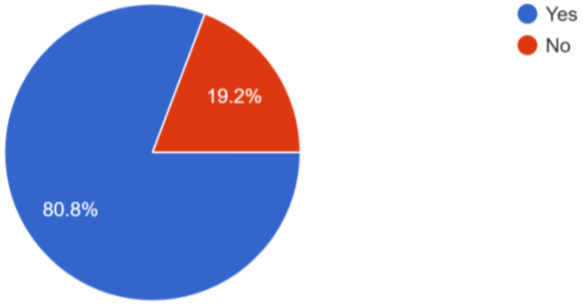
Table 17 Need for better training

SI.NO.	ASPIRE TO FIND FOR BETTER TRAINING	NUMBER OF PARTICIPANTS	PARTICIPANTS (in %)
1.	Yes	46	59%
2.	No	11	14.1%
3.	Maybe	21	26.9%

About 59% of participants aspire to find for better training. 26.9 % of the participants maybe aspire to find for better training and 14.1% of participants didn’t aspire to find for better training.

4. 6 ACHIEVEMENTS AND SUPPORT

Figure 10 Medals or recognition in past academic 3 years



The figure shows that 80.8% of participants won medals in past academic 3 years and 19.2% of the participants didn't won any medals. Most of the participants won intercollegiate tournament medals, national level games medals, inter university games medals , state level and district level tournament medals, Olympics state gold medal etc..

Figure 11 Support and encouragement

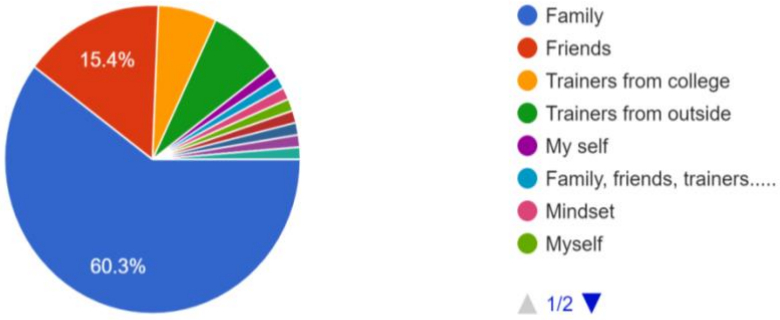


Figure shows that Family(60.3%) supports the participants the most for their passion for sports, then friends (15.4%), Trainers from college (6.4%), Trainers from outside (7.7%), others (10.4%).

SUMMARY AND CONCLUSION

Nutrition composition plays a crucial role in athletic performance, specifically, the type and amount of macronutrients, as well as the timing of consumption before and after workouts. Not all athletes optimally consume macronutrients. The three macronutrients, carbohydrates, protein, and fat, all perform different roles in the body, whether it is for energy, recovery, or to

maintain body functions.The body will use carbohydrates or fats as the main energy source, depending on exercise intensity and duration.

The majority of the participants which makes up to 38.5% belonging to age group of 19 to 20 years. 35.9 % of the participants is belonging to the age group of 21 to 22 years. 19.2 % of participants belonging to age group of 23 to 24 years. 6.4% participants belonging to age group of 17 to 18 years. Out of 78 athletes, 58 participants were males and 20 were females.

To determine the socio-economic status, we used Kuppuswamy scale to assess occupation, education and income of hea d of the family. By calculating the socre and categorised participates into upper, upper middle, lower middle, upper lower and lower. It was revealed that the majority of participants are from Upper lower Class is about 34.61%. 32.05% of participants are from Upper Middle class. 26.93% of participants are from Lower middle class. 6.41% of participants are from Upper class.

Most of the participants consume 3 meals per day (32 participants), its about 41%. 29.5% of participants consume 3 to 4 meals per day (23 participants). 17.9% of participants consume less than 3 meals per day (14 participants). 10.3 % of participants consume more than 4 meals per day (8 participants) and only 1.3% participants consume more than 5 meals per day (1 participant). According to the result drawn from the pie chart shows that 53.8% of the participants haven't the habit of skipping meals and 46.2 % of the participants have the habit of skipping meals. The Majority of participants are tend to skip the breakfast, it is about 40%. Most of the participants are non- vegetarians, it is about 94.9%. 3.8% of participants are Lacto – ovo – veg and only 1.3% of participants are vegan. Most of the participants cconsume2 to 4 litres per day (36 participants), its about 46.2%. 21.8% of participants consume 4 to 6 litres per day (17 participants). 14.1% of participants consume 6 to 8 litres per day (11 participants). 12.8% of participants consume less than 2 litres per day (10 participant). 5.1% of participants consume 8 to 10 litres per day (4 participants). From the results, 54.1% of participants didn't follow any special diet and 35.9 % of participants follow special diet.

Most of the participants are satisfied with their daily diets. 35.4 % of participants are worried about their overall quality of diet. 33.8% of participants are worried about their adequacy of protein. 13.8% of the participants are worried about their food safety aspects. 6.2% of participants are worried about quantity of diet and other. 3% of participants are worried about their financial issue and 1.5 % of participants are worried about their bad habits of eating.

The results revealed that 59% of participants hadn't consume any supplements and 41% of participants had consume supplements. Most of the participants use supplements for better body performance and recovery, for strength training purpose, for muscle recovery, fat burning, for daily protein requirements etc. The majority of participants consume vitamin tablets (62.2%), then Whey protein (60%), Bcaa (46.7%), creatine(33.3%), Glutamine and other supplements (17.8%), ZMA (13.3%), antioxidants (6.7%), carnosine and HMB (4.4%) . Fish oil (2.2%) and about 2.2 % participants didn't consume any supplements.

Out of 78 participants, 62 participants (79.5%) perform workouts and 16 participants (20.5%) didn't perform any workouts. Most of the participants do workout split for 6 days in a week. Some of them Daily perform workouts for fitness. About 48.6% of the participants did workouts less than 10 hours weekly. 33.3% of participants did workouts 10 to 20 hours in a week. 11.1% of participants did workouts 20 to 30 hours weekly and 6.9% of the participants did workouts more than 30 hours weekly. The most of the participants about 46.5% done their training in the morning, 43.7% of participants done their training in the evening and few about 9.9% of participants done their training in night time. The duration of training is about 1 to 2 hours, 2 to 3 hours, 3 to 4 hours and 4 to 5 hours maximum.

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APPENDIX

Name:

Age:

- 17-18
- 19-20
- 21-22
- 23-24

Gender:

- Male
- Female
- Other
- Prefer not to specify

Socio – economic class

1. Occupation of the head of the family.

S.No.	Occupation of the Head
1.	Legislators, Senior officials and Managers
2.	Professionals
3.	Technicians and Associate professionals
4.	Clerks
5.	Skilled workers and Shop & Market sales workers
6.	Skilled Agricultural and Fishery workers
7.	Craft and Related Trade Workers
8.	Plant and Machine Operators and Assemblers
9.	Elementary Occupation
10.	Unemployed

2. Education of the head of the family.

S.No.	Education of the Head
1.	Profession or Honours
2.	Graduate
3.	Intermediate or diploma
4.	High school certificate
5.	Middle school certificate
6.	Primary school certificate
7.	Illiterate

3. Total monthly income of the family.

S.No.	Monthly family Income in Rupees
1.	>_ 1,99,862
2.	99,931-1,99,861
3.	74,755- 99,930
4.	49,962- 74,755
5.	29,973- 49,961
6.	10,002- 29,972
7.	<_ 10,001

Height:

Weight:

Year of study:

Types of Sports performed:

Frequency of meals consumed:

- Less than 3 meals
- 3 meals
- 3 to 4 meals
- More than 4

Do you skip any meals?

- Yes
- No

Which meal do you tend to skip?

- Breakfast
- Lunch
- Dinner

Food Consumption pattern:

- Vegetarian
- Non- Vegetarian
- Lacto – ovo veg
- Vegan

How much litres of water did you consume in a day?

- less than 2 litre per day
- 2 to 4 litre per day
- 4 to 6 litre per day
- 6 to 8 litre per day
- 8 to 10 litre per day
- Above 10 litre per day

Number of snack times

- 2 or 3 times in a week
- Weekly
- Never

How often did you eat from outside?

- Daily
- 2 or 3 times in a week
- Weekly
- Monthly
- Never

How often do you consume home cooked foods?

- Daily
- 2 or 3 times in a week
- Weekly
- Monthly
- Never

How often do you cook for yourself?

- Daily
- 2 or 3 times a week

- Weekly
- Monthly
- Never

Did you consume any supplements?

- Yes
- No

If yes,

Reason for using supplements :

Types of supplement used :

- Vitamin tablets
- Creatine
- Whey protein
- Bcaa
- Carnosine
- ZMA
- HMB
- Antioxidant
- Glutamine

FOOD FREQUENCY TABLE

FOOD GROUPS	**Once in a day**	**Once in a week**	**Once in a two week**	**Once in a month**	**Rarely**	**Never**
CEREALS AND PULSES						
• Rice • Wheat • Bread • Instant foods • Green pea • Mung bean • Dal						

• Chickpea • Soybean • Oats						
FRUITS • Banana • Papaya • Apple • Grape • Watermelon • Avocado • Guava • Lemon • Tomato • Orange • Fig (dried) • Dates • Dried fruits						
VEGETABLES • Carrot • Cucumber • Green leafy vegetables • Beetroot • Potato						

• Sweet Potato						
FISH						
MEAT • Chicken • Beef • Mutton						
EGGS						
DIARY PRODUCTS						
• Milk • Yoghurt • Paneer • Cheese						
FATS AND EDIBLE OILS • Coconut oil • Sunflower oil • Butter • Ghee • Olive oil						
SUGARS • Honey • Jaggery • Sugar						

• Chocolate						
NUTS AND OILSEEDS • Coconut • Cashew • Pista • Almond • Walnut • Peanut						
BEVERAGES • Tea • Coffee • Carbonated drinks • Sweetened beverages • Fruit juices • Packaged fruit juices						

3 DAY RECALL [2 working day and 1 holiday]

Day :1

Time	**Food and beverage description**	**Amount Eaten**

Day :2

Time	**Food and beverage description**	**Amount Eaten**

Day :3

Time	Food and beverage description	Amount Eaten

Do you follow any special diet?

- Yes
- No

If you perform workouts?

- Yes
- No

If yes, workout split for a week:

Duration of workout (weekly)

- less than 10 hours
- 10 – 20 hours
- 20 – 30 hours

- More than 30 hours

If you were doing any training ?

- Yes
- No

If yes,

Duration of training

Timing of training:

- Morning
- Evening
- Night

Are you satisfied with your daily diet as adequate for your sporting activities ?

- Yes
- No

If not, what aspect of your diet are you worried about ?

- Adequacy of protein
- Overall quality of diet
- Quantity of diet
- Food safety aspects
- Other

Have you won any medals/recognition is past academic 3 years?

- Yes
- No

If yes mention :

Who supports you the most for your passion for sports ?

- Family
- Friends
- Trainers from college
- Trainers from outside
- Others

Do you aspire to find for better training ?

- Yes
- No
- Maybe

Do you think diet has a role in optimising your performance?

- Yes
- No

Would you like to get expert advice on diet to enhance your performance?

- Yes
- No
- Maybe

Contextual Body Image Questionnaire for Athletes

In daily life.... or Concerning my sport...

	Very ugly	Ugly	Somewhat Ugly	Neither ugly, nor beautiful	Somewhat beautiful	Beautiful	Very beautiful
I think my appearance is							
I think my appearance compared to others is							
Others think my appearance is							

	Much too thin	Too thin	Somewhat too thin	Neither too thin, nor too fat	Somewhat too fat	Too fat	Much too fat
I think my body shape is							
I think my body shape compared to other is							
Others think my body shape is							

	Much too unmuscular	Too unmuscular	Somewhat too unmuscular	Neither too unmuscular nor too muscular	Somewhat too muscular	Too muscular	Much too muscular
I think the musculariti ty of my body is							
I think the musculariti ty of my body compared to others is							
Others think the musculariti ty of my body is							

	Much too low	Too low	Somewhat too low	Neither too low, nor too high	Somewhat too high	Too high	Much too high
I think my body weight is							
I think my fat percentage is							
I think my body weight compared to other is							
I think my fat							

percentage compared to other is							
Others think my body weight is							
Others think my fat percentage is							