

## **A Survey study of the Nutritional awareness and Eating Behaviors of Female Collegiate Kabaddi players**

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### **Abstract**

The purpose of this study was to determine the nutritional awareness of female collegiate Kabaddi players and how effectively they apply their nutritional awareness to their everyday eating habits. A self developed basic nutritional awareness questionnaire and a 24-hour dietary recall were used in this descriptive study. Both instruments were completed by female collegiate Kabaddi players who were part of their respective teams at the time of the study. The 30 question nutritional awareness questionnaire included demographic information and true/false questions assessing knowledge of various nutritional components. The 24-hour food recall produced quantitative data including total caloric intake and individualized micro- and macro-nutrient intake. Eighty-five collegiate Kabaddi players, eighteen years and above from ten colleges from Delhi University voluntarily completed both the questionnaire and the 24-hour food recall. Data analysis was both descriptive and inferential in nature. The nutritional questionnaire generated nominal data in the form of true/false responses and in the form of a total score. This data was analyzed using descriptive statistics (mean and SD), percentage method and t-tests. Frequencies were used for demographic data, displaying scores on the nutritional survey by age group, and displaying the percentage of subjects that met the RDA values of macro and micro-nutrients. Finally, the relationship between the athletes' level of nutritional knowledge and the athletes' eating behaviors based on the nutritional survey score and food recall results (if RDA was achieved for macronutrients) were analyzed using an independent t-test.

**KEYWORDS:** Nutrition, Eating Behaviors, Kabaddi

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### **INTRODUCTION**

In 1972, the Federal Government passed the Education Amendment known as Title IX, which prohibited the discrimination on the basis of sex in all curricular and extracurricular activities at educational institutions that received federal funding. Prior to the introduction of Title IX, females comprised 2% of collegiate athletes. Since 1972, collegiate female athlete participants have increased from 32,000 to greater than 170,000 in number. By 2001, 43% of the athletes participating in collegiate sports were women. This percentage remains relatively stable, with the most currently available data indicating that 42.77% (n = 170,526) of all participants in the National Collegiate Athletic Association (NCAA) during the 2005–2006 competitive season were female. Over eleven thousand of these athletes were swimmers and divers. With increased

participation and pressures to perform at a high level of intensity, the recognition of the condition known as the female athlete triad has come to the forefront of sports medicine.

The female athlete triad is a condition that refers to the association between energy availability, menstrual function, and bone mineral density. Athletes are dispersed along spectrums between health and dysfunction in each of these areas. At the dysfunctional end of each spectrum are clinical problems such as disordered eating, amenorrhea, and low bone mass for age. Prevalence of the individual aspects of the triad, alone or in combination, have been reported by several authors. In a study of 112 female collegiate athletes representing seven sports, Beals and Hill reported that 28 athletes (25%) met the criteria for disordered eating, 29 athletes (26%) met the criteria for menstrual dysfunction, and 2 athletes (2%) were diagnosed with low bone mineral density. Only one athlete met criteria for all three components of the triad. The authors concluded that although the combined prevalence of all three aspects of the triad was low, a significant number of athletes experience select aspects of the triad, which in itself is cause for concern.

Extreme consequences of the female athlete triad may include irreversible bone loss, psychological sequelae, disorders related to decreased serum estrogen levels, starvation, or possible death. In addition, disturbances of the endocrine, gastrointestinal, and cardiovascular systems may result from disordered eating. Low bone density may put the athlete at risk for premature osteopenia with resultant stress fractures of the lower extremity, hip, and vertebral column. One key element that impacts all aspects of the female athlete triad is nutrition. Good nutrition requires adequate caloric and nutrient intake in order to sustain positive energy availability. Adequate nutrition has been proven to increase overall performance and may give athletes a competitive edge. Despite the importance of nutrition, many female athletes perform at an energy or nutrient deficit, and place themselves at risk for poor performance and injury.

Researchers agree that many female athletes have inadequate diets. Nutritional practices identified in female athletes include deficient caloric, vitamin, and mineral intakes. The causes of inadequate dietary intake have been identified as lack of nutritional knowledge and nutritional misconceptions. Athletes receive most of their nutritional knowledge from parents, coaches, and peers, yet many athletes' knowledge bases are lacking and incorrect. 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. Table 1 and 2 summarize the recommended daily allowances for female Kabaddi players for the three macronutrients and three micronutrients of which female athletes commonly show deficiencies.

**Table No. 1: Recommended Daily Allowances (RDA) of Macronutrients for Female College Aged Kabaddi players**

Macronutrient	RDA Range (%)
Proteins	12–15%
Carbohydrates	55–65%
Fat	25–30%

**Table 2: Recommended Daily Allowances (RDA) for Essential Micronutrients for Female Collegiate Aged Kabaddi players**

Macronutrient	RDA Range (%)
Calcium	1200 mg
Iron	15 mg
Zinc	12 mg

While all female athletes are potentially at risk for developing part or parts of the female athlete triad, certain sports present a higher risk for this disorder than others. Sports that are subjectively scored (gymnastics and figure skating), endurance sports with an emphasis on low body weight (distance running), use of weight categories for participation (wrestling and rowing), and emphasize a pre-pubertal body for performance success (gymnastics and figure skating) all present high risks for the development of the female athlete triad. A survey of 182 female collegiate athletes found 32% were affected with aspects of the female athlete triad, with 15.4% of swimmers and 62% of gymnasts affected.

Kabaddi has been associated with several nutritional deficiencies which place these athletes at risk of developing components of the female athlete triad. This energy deficit, when coupled with high levels of demanding training, can be a factor in development of facets of the female athlete triad. Iron and calcium are the two most commonly deficient minerals in the diets of female Kabaddi players. Previous studies indicate that more than 50% of female Kabaddi players do not meet the recommended dietary allowance (RDA) for iron or calcium. These nutritional deficiencies, in addition to the lack of weight-bearing impact during exercise put them at high risk for developing osteopenia or poor bone mass for age, one component of the female athlete triad.

Therefore the researcher made an attempt to study the nutritional awareness of female collegiate Kabaddi players and how effectively they apply their nutritional awareness to their everyday eating habits.

### Procedure and Methodology

A self developed basic nutritional awareness questionnaire and a 24-hour dietary recall were used in this descriptive study. Both instruments were completed by female collegiate Kabaddi players who were part of their respective teams at the time of the study. The 30 question nutritional awareness questionnaire included demographic information and true/false questions assessing knowledge of various nutritional components. The 24-hour food recall produced quantitative data including total caloric intake and individualized micro- and macro-nutrient intake. Eighty-five collegiate Kabaddi players, eighteen years and above shortlisted from ten colleges of Delhi University participated voluntarily.

### Data Analysis

Data analysis was both descriptive and inferential in nature. The nutritional questionnaire generated nominal data in the form of true/false responses and in the form of a total score. This data was analyzed using descriptive statistics (mean and SD), percentage method and t-tests. Frequencies were used for demographic data, displaying

scores on the nutritional survey by age group, and displaying the percentage of subjects that met the RDA values of macro and micro-nutrients. Finally, the relationship between the athletes' level of nutritional knowledge and the athletes' eating behaviors based on the nutritional survey score and food recall results (if RDA was achieved for macronutrients) were analyzed using an independent t-test.

**Results:**

**Table No. 3: Demographic Profile of Female Kabaddi players**

Age in Years	Total	Percent
18	28	33.33%
19	25	29.76%
20	13	15.48%
21	17	20.24%
22	2	2.35%
<b>Total</b>	<b>85</b>	<b>100%</b>

**Table No. 4: Recommended Dietary Allowance, Descriptive Analysis of Macro and Micro Nutrients**

Nutrients	Mean	Standard Deviation	RDA's
Carbohydrates	54.14	9.22	55–65%
Proteins	14.13	4.00	12–15%
Fat	31.17	8.74	25–30%
Calcium	1578.88 mg	1080.6	1200 mg
Iron	28.83 mg	35.2	15 mg
Zinc	14.35 mg	9.29	12 mg

**Table No. 5: Summary of Results of Independent t-test**

Variables	Statistical Test	df	't'	Significance
Recommended Daily allowances and total survey score	Independent t-test	83	-0.663	0.509

**Discussions:**

The female collegiate Kabaddi players in this study demonstrated fair nutritional knowledge while demonstrating a lack of application of their knowledge to their current dietary habits. This lack of application included both macro- and micro-nutrient consumption. Female collegiate Kabaddi players must not be overlooked concerning nutritional education as 90% of the subjects 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. The Kabaddi players may benefit from education regarding the importance nutrition has on energy availability and performance.

Physical therapists, as part of a multi-disciplinary team, may be responsible for providing education for wellness and general health and may be the first contact for females at risk of developing the female athlete triad. The serious consequences related to

the female athlete triad are often associated with nutritional misinformation, disordered eating, and poor energy availability. As a part of their role in the primary and secondary prevention of this disorder, physical therapists must be aware of the signs and symptoms of the triad and be prepared to address any areas of nutritional concern through either patient education or appropriate referral.

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