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Macronutrient Intake And BMI of the Adolescent Female Football Players

KEYWORDS: Anthropometry measurement, Dietary assessment, RDA, Nutrient adequacy ratio

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ABSTRACT *The study aims to investigate the Macronutrient intake and Anthropometric data of adolescent female football players. The mean age of the female football players was 14.4±1.2 years. Height and weight was recorded and BMI (BOBY MASS INDEX) calculated. The mean height and weight of the subjects were 151.8 ±7.5cm and 38.9 ±7.4 kg respectively. The result showed that 68% of the subjects were underweight, 30% of subjects were normal and 2% of the subjects were obese. The dietary assessment done using the 24 hour dietary recall for 3 days revealed that the mean energy intake was 2909.6±545.5 kcal; protein intake was 87±15.7g, fat intake was 92.6±27.2g and carbohydrate intake was 424±70.9g among 13-15 years female adolescent footballers. The energy and carbohydrate intake were 60.1% and 66.4% adequate when compared with RDA for female adolescents. The mean energy intake was 2909.6±545.5 kcal; protein intake was 87±15.7g, fat intake was 92.6±27.2g and carbohydrate intake was 424±70.9g among 13-15 years female adolescent football players. Protein was 1.5 times in excess while fat is 2.6 times in excess in comparison to the RDA of female adolescents which could be contributed to intermittent snacking of junk as reported by nearly 3/4th (76%) of the football players. Despite increased intakes of all macronutrients, 70% of the 16-18 years football players were under weight, which signifies the need for increased requirement of nutrients. Adequate nutritional counseling is required to address the nutrient intake to optimize performance.*

INTRODUCTION

Football is an intermittent sport characterised by periods of high-intensity play in addition to periods of sub-maximal effort over ±90 min. Players cover approximately 9–12 km per game, depending on their position and level of play[1] and within each playing position, there were significant differences in the physical demands which were dependent on physical performance as well as the playing style of players[2].

Female Adolescents have been identified with a potential risk group for inadequate nutrition because of their attitude to leanness, weight regulation practices[3]. During adolescence, the body experiences a period of rapid growth and development which results in a marked increase in energy and nutrient requirements[4]. Adolescent athletes therefore require an even higher energy supply in order to maintain adequate growth and maturation as well as perform optimally in their respective sporting activities. An inadequate nutritional intake in adolescents may delay pubertal development, alter growth and muscle development and affect exercise performance[5, 6, 7]. It has been shown that regular physical activity increases the demand for energy resulting in additional protein, mineral and vitamin requirements (particularly those which are important for growth such as zinc, copper, iron, and folate)[8].

It is essential to explore and assess these increased nutritional needs of athletes before, during, and after competition for achieving optimal sport performance[9].

MATERIALS AND METHODS

The study was conducted in the sports academy of Faridabad. The sample consists of 50 female football players in the age group of 13 to 18 years. Height and weight was recorded and BMI (BODY MASS INDEX) was calculated. 24 dietary recall was employed to assess the macronutrient intake for 3 consecutive days.

Statistical analysis

Data coding, entry and validation was done. Frequency and percentage were also calculated. The data was analyzed through comparison between Dietary Intake to the Recommended Dietary Allowances for the players. Nutrient Adequacy and Nutrient Adequacy Ratio was calculated.

RESULT AND DISCUSSIONS

The mean age of the female footballers was 14.4±1.2 years. Height and Weight was recorded and BMI (Body mass index) calculated. The mean height and weight of the subjects were 151.8 ±7.5cm and 38.9 ±7.4 kg respectively.

Table 1: Body Mass Index (BMI) of the subjects

CLASSIFICATION	BMI (Asians)	Female Adolescent Footballers		Overall Mean n= 50(%)
		13-15 years n=40(%)	16-18 years n=10(%)	
Underweight	**<18**	30 (75)	7(70)	34(68)
Normal	**18-22.9**	9(22.5)	3(30)	15(30)
Overweight	**23.0-24.9**	0(0)	0	0 (0)
Obese	**>25**	1(2.5)	0	1(2)

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Table 1 reveals that 68% of the subjects fall under the category of underweight. 30% of subjects 'had' in normal BMI and 2% of the subjects were obese The mean height and weight of the subjects are 151.8 ±7.5cm and 38.9 ±7.4 kg respectively.

Table 2: Daily Mean Intake of Macronutrients Nutrients, Percent Adequacy and Nutrient Adequacy Ratio of Adolescent female footballers (13-15 years)

Nutrients	RDA of female Adolescents (13-15 years)	Nutrient Intake	NAR	% Adequacy
Energy (Kcal)	2330	1401.2±458.3	0.6	60.1%
Protein (g)	51.9	45.2±13.4	0.8	87%
Fat (g)	40	37.8±22.8	0.9	94.5%
Carbohydrate (g)	349.5	232.3±77.7	0.6	66.4%

The macronutrient intake was calculated and compared with Recommended Daily Allowances [10] of Female Adolescents in the age group of 13-15 years and 16-18 years. The mean energy intake was 1401.2±458.3 *kcal*; protein intake was 45.2±13.4*g*, fat intake was 37.8±22.8*g* and carbohydrate intake was 232.3±77.7*g*. among 13-15 years age group. The percent adequacy reveals that the energy intake is 60.1% which is highly inadequate to an adolescent girl. The gap is further widened with increased requirements for football. The same holds good for carbohydrate intake with 66.4% adequacy.

Table 3: Daily Mean Intake of Macronutrients, Percent Adequacy and Nutrient Adequacy Ratio of Adolescent female footballers (16-18 years)

Nutrients	RDA of female Adolescents (16-18 years)	Nutrient Intake	NAR	% Adequacy
Energy (Kcal)	2440	2909.6±545.5	1.1	119.2%
Protein (g)	55.5	87±15.7	1.5	156.7%
Fat (g)	35	92.6±27.2	2.6	264.5%
Carbohydrate (g)	366	424±70.9	1.1	115.8%

The mean energy intake was 2909.6±545.5 *kcal*; protein intake was 87±15.7*g*, fat intake was 92.6±27.2*g* and carbohydrate intake was 424±70.9*g*. among 16-18 years age group". The percent adequacy reveals that the macronutrients are consumed in excess to the requirement of female adolescents. Protein is 1.5 times in excess while fat is 2.6 times in excess which contributes to the increased energy intake at 119.2%. The excess fat and energy intake could be contributed to intermittent snacking of junk as reported by nearly 3/4th (76%) of the footballers. Despite increased intakes of all macronutrients, 70% of the 16-18 years footballers were under weight, which signifies the need for increased requirement of nutrients.

The meal pattern observed among the female footballers revealed that 48% consumed 5 meals which included 2 in between snacks, 28% consumed 3 intermittent meals along with 3 main meals, 24% consumed 3 meals & 8% consumed more than 6 meals which was largely intermittent snacking.

CONCLUSION

This study was designed to determine the macronutrient intake and BMI of the adolescent female football players. From this study it was concluded that most of the players were underweight. On the other hand, the intake of Carbohydrate, Protein and fat was very less as per the recommended dietary allowances. Poor intake of nutrients in the diet affects the nutritional status and thereby performance.

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