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Brain Foods Consumption Pattern among Adolescents

SA. Thamilovia[1] and S.Uma Mageshwari[2]

[1] Research Scholar, Department of Food Service Management and Dietetics, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore – 641043, Tamil Nadu, India.

[2] Dean & Professor, Department of Food Service Management and Dietetics, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore – 641043, Tamil Nadu, India

Abstract: *The direct connection between nutrition, brain function and behaviour exists, without any doubt. Inadequate nutrition causes lower cognitive development, reduced attention and concentration and reduces performance. Even though, a number of innovative studies are pointing to the exciting possibility that the effects of diet on cognitive and performance can be transmitted across generations, of consumption of brain foods among adolescents.*

Objective: *The main objective of the study is to find the prevalence rate of obesity among adolescents of age group between 13 to 16 years, assess the consumption pattern of brain foods and to know the food behavior and brain foods consumption among the adolescence.*

Methodology: *381 adolescent boys and girls of age 13 – 16 years were assessed for height and weight based on the inclusion and exclusion criteria and compared with CDC standards. To a sub-sample of purposively selected 60 adolescents, habitual brain food consumption recorded by a food frequency questionnaire along with breakfast consumption and their mood preferences on preferred food items.* ***Results:*** *The results showed that the incidence of underweight and obese was high among adolescents which prove the double burden of malnutrition in current scenario. Totally 27% were underweight, 7% were overweight and 7 % of were obese among adolescents. The consumption of brain foods among boys and girls was found lower and was significant as age group increases. The adolescent's perception is that almond and lady's finger helps in improving the brain health.* ***Conclusion:*** *Inadequate nutrition causes lower cognitive development, reduced attention and concentration and reduces performance and proper intervention among adolescents can help them to march towards healthier brain and life.*

Keywords: *Adolescents, Brain foods, Consumption, Obesity, Perception.*

1. INTRODUCTION

Nutrition affects cognitive possibilities, including alertness and the production or release of neurotransmitters, the chemical messengers that carry information from one nerve cell to another. The incidence of chronic neurodegenerative disorders have become a societal concern, both in terms of decreased quality of life and increased financial burden. Lifestyle factors greatly affect the progression of stress, with high-risk behaviors including unhealthy diet, lack of exercise, smoking, and exposure to environmental toxins leading to enhanced oxidative stress and inflammation. Primary prevention in many neurodegenerative diseases can be achieved earlier in life by consuming a healthy diet, rich in antioxidant, anti-inflammatory phytochemicals and omega 3 fatty acids, which offers one of the most effective and least expensive ways to address the crisis [1].

The direct connection between nutrition, brain function and behaviour exists, without any doubt. Adolescence is one of the most rapid phases of human development. It is a transitional stage of physical and psychological development that generally occurs during the period from puberty to legal adulthood (age of majority) where biological maturity precedes psychosocial maturity. WHO (2007) [2] defines 'Adolescents' as individuals in the 10-19 years age group.

Formation of neurotransmitters and prostaglandin is affected by omega-3 and omega-6 fatty acid proportion high in brain foods, which is very important in the maintenance and regulation of normal functioning of the brain [3]. The significance of this study is based on nutrition helps in brain functioning and neurodegerative activity.

1.1 RATIONALE OF THE STUDY

Important neuronal developments are also taking place during the adolescent years. There is evidence that intake of brain foods is associated with reduction in the depression-like symptoms most often in women [4]. Proper nutrition and health are closely interrelated throughout life. Inadequate nutrition causes lower cognitive development, reduced attention and concentration and reduces performance [5]. Even though, a number of innovative studies are pointing to the exciting possibility that the effects of diet on cognitive and performance can be transmitted across generations, it needs attention of consumption of brain foods among adolescents.

1.2 OBJECTIVES

- Assess the consumption pattern of brain foods and
- To know the food preference among the adolescence.

2. METHODOLOGY

Initially, 381 adolescents' boys and girls of age 13 – 15 years were assessed for their nutritional status based on the following inclusion and exclusion criteria.

2.1 Inclusion criteria

- Adolescents belonging to 13 - 15 years age
- Both boys and girls
- Willingness to participate in the study

2.2 Exclusion criteria

- Adolescents who are under mid-day meal scheme
- Differently-able adolescents

The height (cm) and weight (kg) of the adolescents were recorded and BMI was calculated and compared with Centers for Disease Control and Prevention, National Center for Health Statistics (CDC), 2000[6].

To a sub-sample of sixty adolescents (28 boys and 32 girls) in the age group of 13 – 15 years were selected by purposive sampling and the brain food consumption was recorded by a food frequency questionnaire to assess the habitual consumption frequency of consumption could be indicated as never or in times per day, week, month, or year. The questionnaire also included questions on breakfast consumption and their mood preferences on preferred food items for increasing concentration power and before exam meals. All the data collected was consolidated and analyzed.

3. RESULTS

Distribution of adolescents with respect to age, gender and BMI

In the current study, 359 adolescent students between the ages of 13 – 15 years were assessed. BMI distributions of the adolescents with respect to age and gender are given below.

Table 1; *Distribution of Table 1: Adolescents with Respect to Age, Gender and BMI (n=381)*

BMI percentile		UW		NW		OW		O	
		<5th		<5th - <85th		≥85th - <95th		>95th	
Age	Gender	n	%	n	%	N	%	n	%
13 (n=165)	Boys (n=96)	29	**30**	55	**58**	7	**7**	5	**5**
	Girls (n=69)	22	**32**	38	**55**	4	**6**	5	**7**
14 (n=144)	Boys(n=90)	20	**23**	64	**71**	3	**3**	3	**3**
	Girls (n=54)	12	**23**	32	**59**	4	**7**	6	**11**
15 (n=72)	Boys (n=51)	11	**21**	34	**67**	4	**8**	2	**4**
	Girls (n=21)	7	**33**	7	**33**	3	**15**	4	**19**

Table 1 shows that in the total number of boys (237) and girls (144), 96 boys and 69 girls were 13 years, 90 boys and 54 girls were in 14 years and 51 boys and 21 girls were in 16 years age group of 13,14 and 15 years. The occurrence of underweight was predominant among adolescents. Among boys, the underweight was observed to be as 30%, 23% and 21% in the age group of 13, 14 and 15 years respectively. Among girls, the underweight was observed to be as 32%, 23% and 33% in the age group of 13, 14 and 15 years respectively. Over weight and Obesity was seen more in girls of age 14 and 15 years (11% and 19% respectively). BMI result signifies the occurrence of double burden in which we have under nutrition and overweight/ obesity.

Consumption and preferences of food among adolescents:

From the total number of 381 adolescents, a sub sample of 30 boys and 30 girls were purposively selected and the consumption, preference and frequency of food pattern were recorded.

Table 2. *Consumption and preferences of food among adolescents*

S.No.	Variables	Choices	Boys (30)	Percentage	Girls (30)	Percentage
1.	Breakfast consumption	7 days	21	**70**	27	**90**
		Less than 5 days	9	**30**	3	**10**
2.	Vitamin supplements consumption	Yes	8	**27**	10	**33**
		No	22	**73**	20	**67**
3.	Proprietary beverage consumption	Yes	28	**93**	30	**100**
		No	2	**7**	0	**0**

The above table signifies that among the selected 60 adolescents (30 boys and 30 girls), breakfast consumption was uneven for 30 % boys and 10 % girls. Vitamin supplements are seen in 27 % of boys and 33 % of girls. The supplements consumed by adolescents were cod liver capsules, iron and multivitamin tablets. Additionally, the consumption of proprietary beverages like boost, horlicks, bournvita was noted positive among 93 % boys and 100 % girls. This signifies that majority of selected adolescents consumed supplements and proprietary foods.

Frequency pattern of brain foods among adolescent boys

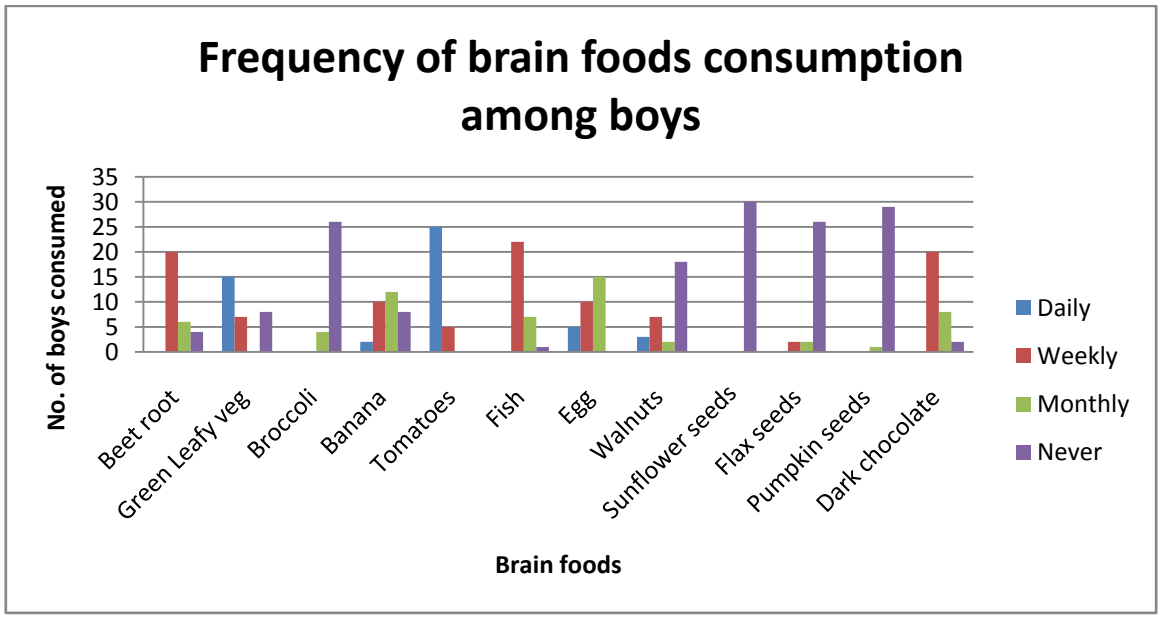

Chart 1: *Frequency pattern of brain foods among adolescent boys (n=30)*

The frequency pattern of adolescent boys showed that brain foods like greens, banana, tomatoes, egg and walnuts were consumed. Foods like sunflower, flax and pumpkin seeds were consumed less among adolescent boys. This could be due to lack of knowledge on brain foods. As far as adolescents concerned their dietary habit are directly influenced by factors like food preferences, faulty food choices and media misinformation. This could have a direct influence on the choices of food selection and intake among adolescents.

Frequency pattern of brain foods among adolescent girls

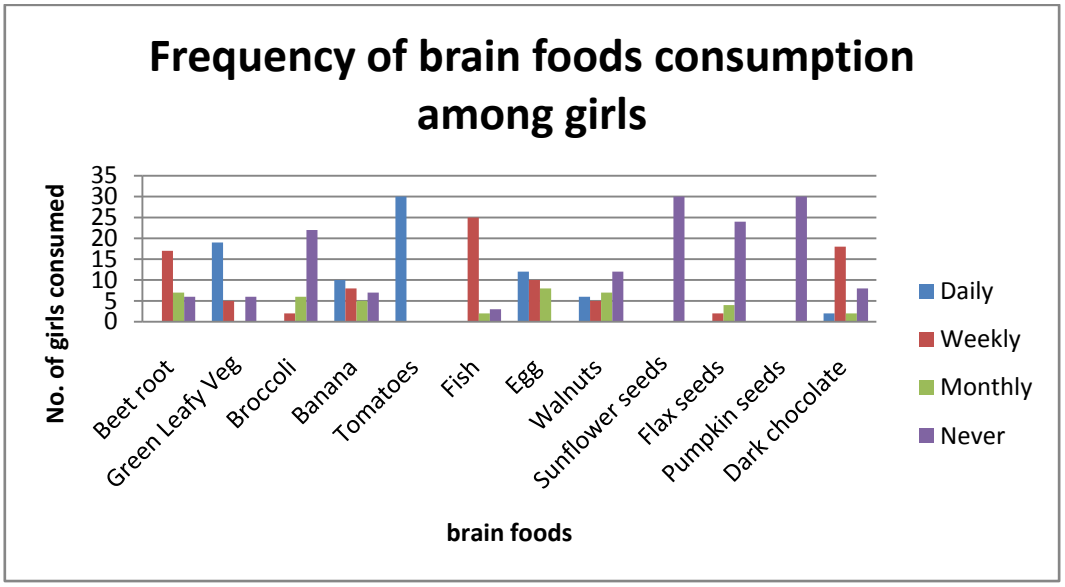

Chart 2: *Frequency pattern of brain foods among adolescent girls (n=30)*

The daily frequency for adolescent girls (Chart 2), was same as that of boys. Proper intervention has to be given in order to make the adolescent food choices better. Even though there are lot of interventional strategies being carried out through research among adolescents, researches including their preferences and food beliefs has to be taken care and given importance to make them better understandable and to gain much significant. Although the food choices and preferences are significant as the age group of the adolescent increases, the effective approach relies on the sustainable interventional strategies. There is a significant difference among the gender in consumption of brain foods **(p value = 0.043)**. The consumption of brain foods among boys and girls was significant as age group increases.

Perceptions of foods help in increasing concentration power among adolescents

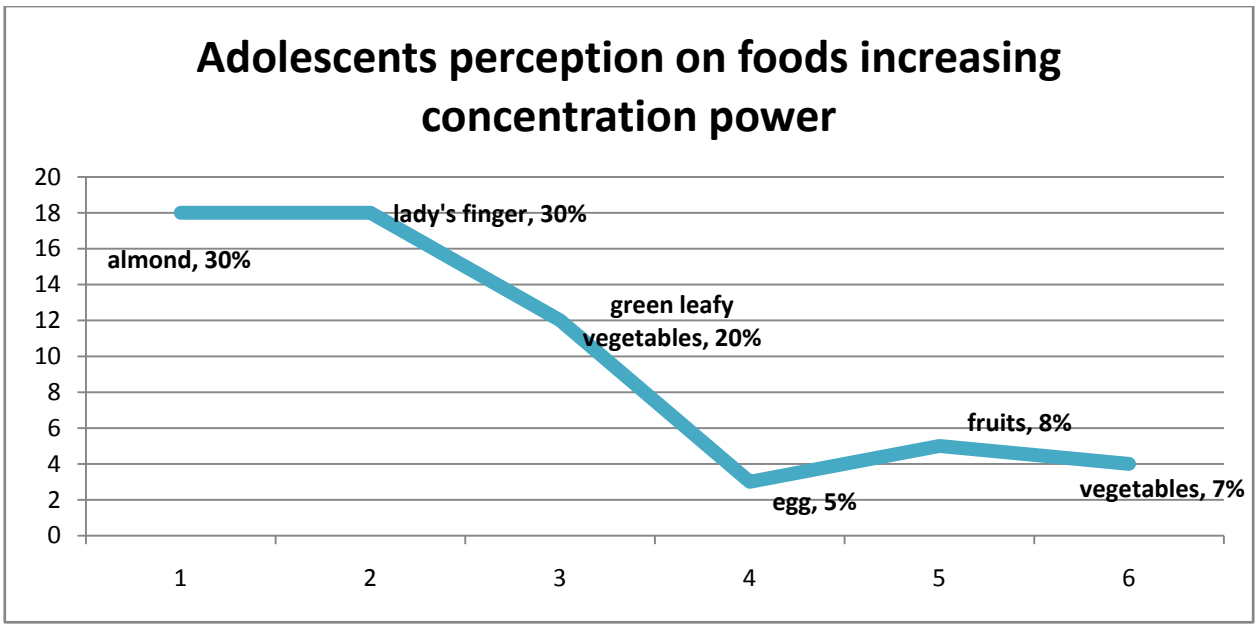

Chart 3: *Adolescents perception on foods increasing concentration power*

The adolescent food preferences have a direct influence in food choices and liking towards food by them. The above figure shows that majority of adolescent have belief that almonds and lady's finger helps in increasing and strong

concentration power. This has a direct relationship on the dietary intake of the adolescents. Detrimental habits picked up during this age generally persist in adult life[7].

4. CONCLUSIONS

Inadequate nutrition causes lower cognitive development, reduced attention and concentration and reduces performance and proper intervention among adolescents can help them to march towards healthier brain and life. Adolescents are still lagging in food selection especially in micronutrients which helps to lead a healthy life. Due to changing dietary habits inappropriate intakes during adolescence can have several consequences. Nutrition education on sustainable healthy food habits, and importance of functional foods should be intervened which will help to bridge the gap between knowledge and practice of food choices, preferences and belief.

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