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Comparitive Study of Dietary Intake and Recommended Dietary Allowances for Nutrients in Age Group of 6-11 years of School Childern

Khushboo Sahu
Research Scholar,
Deptt.of Home Science,
DFSM,
IGNOU,
City Fill

Rajlakshmi Tripathi
Associate Professor,
Deptt.of Home Science,
Govt. M.H. College of Home,
Science and Science for Women,
Jabalpur, M.P

Abstract

The aim of this study was assessesing the differance between actual ditary intake and and Recommended Dietary Allowences (R.D.A.) for nuteitients in school childern. The sample size were collected from SatyaPrakash Public School, Polypather Jabalpur (M.P.), it is a boarding school. The total number of sample size was 250 of the age group 6-11 years from primary section of the school. The 24 hrs recall method was used for data collection and nutritive value of dietary intake was calculated with the help of Nutritive Value of Indian Foods (Gopaln C.*et.al* 2007). Dietary intake were tabulated and statically analysed with the use of *SPPS* software. Result shows that school children consumed unbalanced amount of nutrients specially macro nutrients, so that nutrition education program should be compulsory in school and provide the balanced diet in school for improving nutritional status of children for making a healthy country.

Keywords: please add some keywords

Introduction

Nutrition is intimately related to growth and well being of children.Their physical as well as mental activites are direct reflection of their current and past nutritional status. Their interests and achievements are dependent on their health inspite of genes for good physique and intelligence, it is the level of nutrition received by children which is key determinant of genetic expression. diet is responsible for complex reactions that take place in your body in your cells, tissues, and organs and it is also might affect whether or not you are likely to get certain diseases, such as cancer or heart disease. The relationship between diet and genetics could explain why one person eats a very healthy diet and never gets heart disease, while another eats a similar diet and has a heart attack at an early age. Eating a healthy diet is important for everyone and for many reasons. But what is exciting about nutritional genomics is that at some point in the future, genetic testing may identify what your own health risks are. Then you can have a diet tailored to prevent those health risks from occurring in your lifetime. For example Al-Haddad Fatima *et.al* (2015) concluded the existing dietary guidelines which promote increased intakes of dietary fiber, fruit and vegetables and limited intakes of fats and salt for children with T1DM and focus on improving the diet of both normal children and children with T1DM.

Malnutrition is a biggest health problem in our country. In a study it was found that food and nutrient intake was inadequate and anthropometric measurements (mean height and weight) were significantly ($P<0.05$) lower than reference value, regarding prevalence of malnutrition, it was found that 54.11 percent of the children were stunted and 55.5% were underweight (Sati Vandana and Saroj Dahiya 2012). In other research showed that the obesity of girls age group of 8-11 years it is linked to excessive energy intake from all macronutrients like Sugary drinks and snack foods were consumed in high quantities and contribute to positive energy balance (Al-Kutbu Rabab *et.al*. 2017). The children showed vegetable consumption below the recommended level, while foods of the food group of oils and fats, as well as the group of sugars, candies, chocolates and snacks, were consumed in excess amount (Leal Katharine Konrad *et.al*.2015). Physical inactivity and high calorie diet increases the risk of being overweight (Ashok NC *et.al*. 2014). According to **Espino1 J**

Mona rrez *et.al*.(2004) various micronutrient deficiencies was identified including zinc and vitamin B12, but the prevalence of iron and folic acid deficiency was lower than expected in school going children.

Bernardo de O Carla. (2012) concluded that high prevalence of overweight/ obesity among schoolchildren, which was associated with the nutritional status of mothers and fathers, these results confirm the need to prevent overweight/obesity in schoolchildren with actions that also involve the family environment in order to reduce obesity in this population. There is a need for education for parents, children, schools, and health professionals on how to achieve a healthy balanced diet (M.Tweney Ellen *et.al*. 2017). Recommended Dietary Allowances for different age group of children represented here-

Boys (5 ~ 17 years)

Nutrient's	5~7 yrs	7~9 yrs	10~11 yrs	12~13 yrs	14~15 yrs	16~17 yrs
Energy (kcal)	1850	2100	2200	2400	2650	2850
Protein (grams)	30	39	49	61	74	80
Calcium (mg)	400~500	400~500	600~700	600~700	600~700	500~600
Iron (mg)	7	7	7	12	12	6
Vitamin A (mcg)	300	400	575	725	725	750
Vitamin D (mcg)	10	2.5	2.5	2.5	2.5	2.5
Thiamin [Vitamin B1] (mg)	0.74	0.84	0.88	0.96	1.06	1.14
Riboflavin [Vitamin B2] (mg)	1.11	1.26	1.32	1.44	1.59	1.71
Niacin [Vitamin B3] (mg)	12.2	13.9	14.5	15.8	17.5	18.8
Vitamin B12 (mcg)	1.5	1.5	2	2	2	2
Folic Acid (mcg)	100	100	100	200	200	200
Vitamin C (mg)	20	20	20	30	30	30
Fiber (gram)	23	26	29	31	33	34
Sodium (mg)	1200	1500	1900	2200	2300	2300
Cholesterol (mg)	300 max	300 max	300 max	300 max	300 max	300 max
Total Fat (gram)	59.2	67.2	70.4	76.8	84.8	91.2
Saturated Fat (gram)	18.5	21	22	24	26.5	28.5

Girls (5 ~ 17 years)

Nutrient's	5~7 yrs	7~9 yrs	10~11 yrs	12~13 yrs	14~15 yrs	16~17 yrs
Energy (kcal)	1750	1800	1950	2100	2150	2150
Protein (grams)	30	39	51	63	66	60
Calcium (mg)	400~500	400~500	600~700	600~700	600~700	500~600
Iron (mg)	7	7	7	18	18	19
Vitamin A (mcg)	300	400	575	725	725	750
Vitamin D (mcg)	10.5	2.5	2.5	2.5	2.5	2.5
Thiamin (mg)	0.7	0.72	0.78	0.84	0.86	0.86
Riboflavin (mg)	1.05	1.08	1.17	1.26	1.29	1.29
Niacin (mg)	11.6	11.9	12.9	13.9	14.2	14.2
Vitamin B12 (mcg)	1.5	1.5	2	2	2	2
Folic Acid (mcg)	100	100	100	200	200	200
Vitamin C (mg)	20	20	20	30	30	30
Fiber (gram)	23	25	28	28	27	23
Sodium (mg)	1200	1500	1900	2200	2300	2300
Cholesterol (mg)	300 max	300 max	300 max	300 max	300 max	300 max
Total Fat (gram)	61.3	63	68.3	73.5	75.3	75.3
Saturated Fat (gram)	21	21.6	23.4	25.2	25.8	25.8

M.V Sriramachandrasekharan, and Ravichandran, M. (1999).

The importance of community-level nutrition intervention programs to improve children's diet quality in low income, medically underserved areas and suggest that such interventions may help reduce the risk of obesity (Kranz Sibylle *et.al*. 2009). The aim of this study determine the relationship between actual dietary intake of nutrients with recommended dietary allowances for children age group of 6-11 years old studying in primary section

Review of Literature

According to Ochola Sophie *et.al.* (2014)The dietary intake of school children and adolescents in developing countries is limited in diversity, mainly comprising plant-based food sources, but limited intake of fruits and vegetables, low energy and insufficient micronutrient intake . Childhood obesity is highest in a recent statistics result show that 16% of children between the ages of 6 and 11 years are overweight and 14.3% are at risk of becoming overweight (*St-Onge Marie-Pierre et.al (2003)*. Result of Srivastava1 Anurag *et.al*. (2012) show that regarding nutritional status, prevalence of stunting and underweight was highest in age group 11 years to 13 years whereas prevalence of wasting was highest

in age group 5years to 7 years. Another result of Galloway Tracey (2008) show that Prevalence of overweight and obesity were high in this sample, with 17.7% of children classified as overweight and 10.9% of children classified as obese, 15% of boys were classified as obese, compared to 6.8% of girls, Boys consumed significantly more servings from the grain and meat food groups than girls and daily intake of fibre and micronutrients was significantly low in both boys and girls, there were significant gender differences in nutrient intake boys consuming greater energy, protein, carbohydrate, calcium, iron, phosphorus, and sodium than girls. Almuhanna Monira Abdulrahman *et.al*. (2014) found that obesity among children between the age of 6- 15 years school girls and boys ware significantly associated with fast food intake (p = 0.0280). It was also observed that 72.5% of the overweight or obese students consumed fast food at least 4 times/week, and the other 15.9% were taking fast food 1- 3 times/week, only 11.6% of the same overweight or obese group did not consume any fast food/ week. . Nutritional underweight and stunting were similar to those reported in rural localities at the national level, but overweight was less prevalent in children aged 10–14 years, Various micronutrient deficiencies was identified including zinc and vitamin B12, but the prevalence of iron and folic acid deficiency was lower than expected. These results suggest that children boarding schools may be the better-off children from these extremely poor and marginalized areas according to Espino J Monarres *et.al.* (2004).

Materials and Methodssample Size

The total number of subject were 250 childern from primary section of SatyaPrakash Public School, Polypather Jabalpur (M.P.). The students ranged in age 6 to 11 years and belonged to families where parents had at least three years of higher education.

Dietary Assessment

The 24 hrs recall method of data collection requires individuals to remember the specific foods they consumed in the past 24 hrs. In case of children the person preparing and serving meals is the respondent. The respondents were asked to report the raw ingredients used for the whole family in the previous 24 hrs which were recorded in the local volumetric measures or standard volumetric measures and later converted to grams if possible .The volume of cooked food was also recorded in local or standard volumetric measures. These were converted to raw weight of foods in grams. The nutritive value was calculated with the help of Nutritive Value of Indian Foods (Gopaln C.*et.al* 2007).

Statistical Analysis

Information regarding their dietary intake were tabulated and statically analysed with the use of *SPPS* software.

Result and Discussion

Table- 1 Comparison of Mean Scores of Dietary Intake of Nutrients with Recommended Dietary Allowances for Boys

Nutrient	RDA 5-7 yrs	Nutrient Intake	RDA 7-9 yrs	Nutrient Intake	RDA 10-11 yrs	Nutrient Intake
Energy (kcal)	1690	1580±175	1950	1865±272	2190	1910±373
Protein (grams)	30	28.5±3.2	41	36.52± 10.7	54	40.8±2.8
Calcium	400	388±249	400	289.12±13	600	295.6±10.7
Iron	18	17.5±4.5	26	22.3±2.87	41	36.8±3.2
Vitamin A	400	335.8±65.6	600	436.4±48.0	600	575±5.6
Thiamine (Vit B2)	0.74	1.40±0.06	0.84	0.49±0.15	1.1	2 ± 0.01
Riboflavin	1.11	1.29±0.08	1.26	0.36±0.15	1.3	1.32±0.06
Niacin	12.2	10.7±4.2	13.9	10.6±3.57	15.2	14.5±5.6
Vitamin B12	0.2-1.0	1.2±0.5	0.2-1.0	0.07±0.05	0.2-1.0	2±0.05
Folic Acid	40	32.8±8.9	60	43.0±23.2	70	65.8±9.5
Vitamin C	20	18.5±0.58	20	16.3±1.8	20	18.2±2.6
Total Fat	59.2	60.6±2.53	67.2	66.0±5.6	70.4	68.4±8.3

Recommended dietary allowance (RDA) are the levels of intake of essential nutrients considered to be adequate to meet the known nutritional needs of all healthy persons. The concept of RDA is that individuals of similar age, sex and physical activity levels may have different nutrient needs. School children were lower consumption in several macro and micro nutrients intake compared to Recommended Dietary Allowances (RDA) according to Boanikolla Vijayasree (2016).

Intakes of energy, plant protein, total fat, saturated fatty acids, monounsaturated fatty acids and starch were significantly higher in boys, while intakes of sucrose and total water were significantly higher in girls (Merkiel Syiwia 2014).

Table 2- Comparison of mean scores of Dietary intake of nutrients with Recommended Dietary Allowances for Girls

Nutrient	RDA 5-7 yrs	Nutrient Intake	RDA 7-9 yrs	Nutrient Intake	RDA 10-11 yrs	Nutrient Intake
Energy (kcal)	1690	1620±155	1950	1805±272	1970	1890±273
Protein (grams)	30	28.5±3.2	41	35.9± 8.7	57	45.8±3.8
Calcium	400	388±249	400	289.12±13	600	285.6±9.7
Iron	18	15.5±2.5	26	22.3±2.87	19	22.8±2.2
Vitamin A	400	323.8±45.6	600	436.4±48.0	600	575±5.6
Thiamine (Vit B2)	0.74	1.20±0.06	0.84	0.49±0.15	1	2 ± 0.01
Riboflavin	1.11	1.15±0.08	1.26	0.36±0.15	1.2	1.12±0.04
Niacin	12.2	10.7±4.2	13.9	12.6±4.57	14	12.5±3.6
Vitamin B12	0.2-1.0	1.2±0.5	0.2-1.0	0.07±0.05	0.2-1.0	0.2±0.05
Folic Acid	40	22.8±7.9	60	48.0±27.2	100	64.8±8.5
Vitamin C	20	16.5±0.48	20	15.3±2.8	20	17.2±1.6
Total Fat	59.2	50.6±1.53	67.2	68.0±4.6	68.3	66.4±7.3

In another study indicates the intake of the nutrients like energy, protein, fat, β-carotene, B-complex vitamins, vitamin C, iron and calcium was found to be significantly (P<0.01) lower than the recommended dietary allowances, the lowest being iron (28.6%) and Vitamin B12 (7%). It was also observed that the nutrient intake was higher in boys as compared to girls (Sati Vandana and Saroj Dahiya 2012). The finding of this study were slightly same, school children were not take balanced diet compared to RDA and boys were take excess amount of nutrients compared to girls showed in both table. Table-1 showed that almost all the nutrients were taken as per the RDA by the children. Macro nutrients like Energy, protein and fat were in Slightly excess while micro nutrients like calcium, iron, vitamin B-complex, magnesium, zinc, folic acid are generally were consumed in recommended amounts by these groups. Table-2 that almost all the nutrients were taken as per the RDA by the girls also. Macro nutrients like Energy, protein and fat were in Slightly less than required amount while micro nutrients like calcium, iron, vitamin-B complex, magnesium, zinc, folic acid are generally were consumed in recommended amounts by these groups.

Conclusion

Malnutrition is not only a problem for primary school children, it is problem of all age groups. The present investigation show that dietary intake of micro nutrients intake is normal in both gender but macro nutrients are sligtly exess in boys and slighty less in girles compaied to Recommended Dietary Allowences (RDA). So nutrition education program is nessesory for improving healthy eating specilly in school childern because school period is a learing preiod althrougth pre school childern capicity of learing is limited. And provide a balanced diet in boarding school meals and pramot a healthy eating for making a healthy society.

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