



ISSN (E): 2277-7695  
ISSN (P): 2349-8242  
NAAS Rating: 5.23  
TPI 2022; SP-11(10): 75-77  
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[www.thepharmajournal.com](http://www.thepharmajournal.com)  
Received: 01-07-2022  
Accepted: 05-08-2022

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## Assessment of gap in dietary intake of early adolescent girls in mid-day meal programme implemented middle schools in Odisha

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### Abstract

Adolescence is the period of transition between childhood and adulthood. During early adolescence (ages 10-13) children often start to grow more quickly due to puberty growth spurt. This period is a vital period for girls. Mid-Day Meal is a supplementary nutrition programme in the schools in Odisha to enhance the nutritional status and to ensure education for all children. This study aimed at assessing the gap if any in the dietary intake of early adolescent girls as per RDA in the Mid-Day Meal programme implemented schools in Mayurbhanj district of Odisha. The objective of the study was to assess the demographic profile of early adolescent girls in middle schools to determine the gap in dietary intake as per RDA and to assess the factors affecting dietary intake of the respondents. A total of 60 number of girl students in middle schools in the group of 10-13 years were randomly selected to be the respondents of the study in Mayurbhanj district of Odisha. Descriptive statistics like frequency, percentage, arithmetic mean, standard deviation and gap percentage (%) were adopted to analyze the data. The 24-hour recall method was used to determine the dietary pattern and the dietary intake of nutrients was calculated as per the values given by ICMR, 2020. Then the actual intake was compared with the RDA and gap was determined. The results indicated that, there is significant gap between RDA and actual intake. It was found that the gap between RDA and actual intake in macro nutrients are 396 kcal in Calorie intake, 2.938 gm in protein and 6.064 gm in fat. The gap between RDA and actual intake in micronutrient (vitamin-A) is 49.13 ug. The gap between RDA and actual intake in minerals are 220. 78mg in calcium and 1.97 mg in Iron. The result indicated that there was significant gap in nutrient intake. The study indicated that the mid-day meal programme can include healthy items in the menu as per the preference of children to decrease the wastage of food and to enhance the dietary intake as it provides a major portion of the total dietary requirement of the adolescent girls.

**Keywords:** Early adolescent girl, mid-day meal programme, dietary gap, calorie, protein, fat, vitamin-A, calcium, iron

### Introduction

Adolescence is the period of transition between childhood and adulthood. During early adolescent (ages 10-13) children often start to grow more quickly. Many girls may start their period at around age 12, on average 2-3 years after the onset of breast development.

Mid-day meal programme is the popular name for the school meal programme in India. The national programme for nutritional support to primary education (NP-NSPE) was launched as a centrally sponsored scheme on 15<sup>th</sup> august 1995 with a view to enhance enrollment, retention, attendance and nutritional status of children. Tamil Nadu was the first state in India to introduce this scheme. The first school which had the scheme since 1925 was Sourashtra Boys Higher Secondary School, Madurai. By 2002, the scheme was implemented in all of the states under the orders of the Supreme Court of India.

The Mid-Day Meal Scheme is a school meal programme of the government of India designed to improve the nutritional status of school age children nationwide. The objective of the programme were enhancing school enrollment, student retention, improving student attendance and improving nutritional status of children.

The socio-economic status may be defined as "a position attained by any individual within a system of hierarchical social structure." SES has a major role to play in seeking health care services, accessibility issues, affordability costs, acceptance by beneficiaries and overall utilization of services by the people. Kuppuswamy scale was developed for assessing the SES of an urban individual. This is the most commonly used scale for determining the SES of an

urban family. It took three parameters into account, namely, education, occupation, and income of the individual. The parameters were modified as education and occupation of the HOF and the income of the whole family, pooled from all the sources.

**Materials and Methods**

The present study was conducted in Mayurbhanj district of Odisha. In this study, we collected information from 60 children from class 6<sup>th</sup> and 7<sup>th</sup> in the age group 10-13 years from government-run-upper primary schools (Maharani Prem Kumari Girl’s High School), which is sufficient to apply the bivariate and multivariate analysis and to come out with findings.

The specific questionnaire had been developed to understand the perspective of children regarding the food provided as a part of the Mid-day meal scheme. The questions of this schedule were asked to children of class 6<sup>th</sup> and 7<sup>th</sup> standard, which covers daily practices in food distribution, their likes and dislikes towards foods provided, personal hygiene and sanitation in the school.

To identify the socio-economic status of the respondents uses Kuppaswami Scale. Socioeconomic status (SES) is one among important indicators to evaluate the health status and nutritional status of a family.

For calculating all the nutrients like calorie, protein, fat, iron calcium and Vitamin-A in food items of mid-day meal, one week menu has been followed and quantity provided to each child was weighed. We also use 24-hour recall method for collecting the whole day meal pattern and collect data 3 alternative day in a week. An average of all the macro and micro nutrients content in each cooked items has been calculated by Nutritive Value of Indian Foods by ICMR, RDA, 2020 (NIN, Hyderabad).

**Analysis of Data:** All the data obtained through questionnaire cum interview schedule were coded and entered into computer taking into consideration all the parameters of the relevance and importance of the study. Various parameters are used to evaluate the data like Frequency, Percentage, Arithmetic Mean, Standard deviation, Percentage gap etc.

**Results and Discussion**

The study found that maximum number of sample (58.33%) having the age between 10-11 year, 33.33% were in 11 to 12 years and only 8.33% children are in the age between 12 to 13 years. A study was conducted by P. Singh and M. Aggarwal, vol. 20 (2020) [12] conducted a research regarding this topic and find out comparatively similar result that 68.7% girls were aged between 10-11 years, 21.3% were aged between 11-12 years while 10% were more than 12 years. Majority of the respondents were Hindu (57%) and rest were from Muslim community (3%). A study was conducted by Garget *et al.* concluded that majority of the children (60.5%) belonged to the lower caste (15.2%) and rest (3.5%) were from the Muslim community. Higher portion of the sample (55%) are General in category, 8.33% are OBC and 23.33% are from ST and 13.33% are from SC category. A study was conducted by Pratchi (2004) he found that SC category was (12.6%) and ST (19.9%). Only 35% of the respondents are having menstrual cycle and rest (65%) of the early adolescent girls are not having menstrual cycle.

The study provides the information regarding the quantity of food served is sufficient or not. The study concluded that a large no. of respondents (83.33%) are satisfied of the quantity

of food while 16.66% of the respondents are not satisfied of the quantity of food served. The result shows 41.66% of the respondents like boiled egg. While 30% and 28.33% of the students like soybean and dalma respectively. The study also found that no student like potato curry.

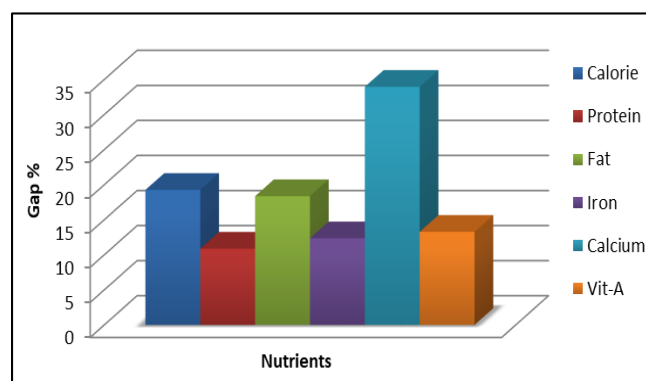
The present study concluded that 53.33% of the respondents are intake calorie between the ranges of 1500-1700 kcal. This table also shows that 25% of the respondents are intake 1200-1500 kcal and 21.66% of the respondents are 1700-2000 kcal per day. 41.33% of respondents are intake 30-50gm protein, 33.33% of the respondents are taking 20-30gm protein, and 25% of respondent are intake 40-50gm of protein per day. 41.66% of the respondents are consuming 30-40 gm., 33.33% of the respondent are consuming 25% of the fat per day. 70% of the students are consuming less than 10 mg and 30% of the respondents are taking more than 15 mg fat for day. Majority of students are consuming 300-400 mg, 25% of the students consuming 200-300mg, and 11.66% of the students consuming 400-500mg of calcium per day. And large no. of student (58.33%) of the respondent consuming 400-500 ug of vit-A where 31.66% of the students are also consuming 300-400 ug and only 10% of the students are consuming 500-600 ug of vitamin A per day.

**Table 1: Gap between RDA and Actual intake by the girls**

Sl No.	Nutrients	Mean Value	RDA	Standard Deviation	Gap	Gap %
1	Calorie (kcal)	1663.21	2060	184.58	396.78	19.26
2	Protein (gm.)	24.06	27	7.78	2.93	10.88
3	Fats (gm.)	26.936	33	5.50	6.06	18.37
4	Iron (mg)	14.02	16	2.07	1.97	12.36
5	Calcium (mg)	429.21	650	56.44	220.78	33.96
6	Vit-A (ug)	320.86	370	55.31	49.13	13.28

Source: ICMR, 2020

Table no. 1 provides information regarding the gap between the RDA (Recommended Dietary Intake) and the actual nutrients intake of the respondent. The study concluded that there are significant gap between all the nutrients. The gap between RDA and actual intake in macro nutrients are 396 kcal in Calorie intake, 2.938 gm in protein and 6.064 gm in fat. The gap between RDA and actual intake in micronutrient is 49.13 ug. The gaps between RDA and actual intake in minerals are 220.78mg in calcium and 1.97 mg in Iron. A study was collected by Patel *et al.* [5], evaluated that comparing RDA based on the 24 hour dietary recall method and found that girls receive 59% of the energy, 67% of protein, 44% of calcium and 48% of micronutrients.

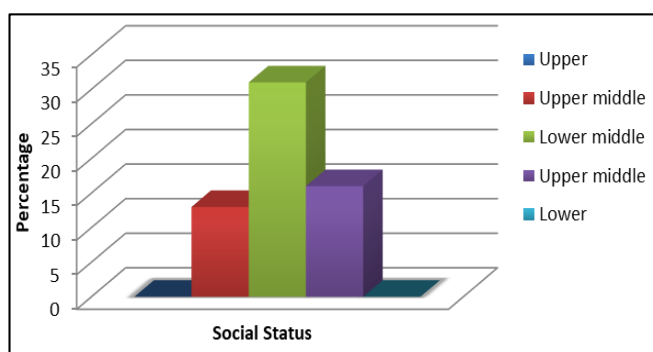


Gap between RDA and Actual intake

**Table 2:** Distribution of the respondents according Kuppuswamy SES scale

Sl. No.	Status	Scale	Frequency (f)	Percentage (n=60)
1	Upper	26-29	0	0
2	Upper middle	16-25	13	21.66
3	Lower middle	11-15	31	51.66
4	Upper lower	5-10	16	26.66
5	Lower	<5	0	0
6		Total	60	100

From Table no. 2 it is evident that there is large no. of the respondents (51%) from lower middle class. The study also found that, 26% of the respondents are from upper lower class and 21% of the respondents are from upper middle class. The research also found that no respondents are from upper class as well as lower class (0%). The major finding of the study indicated that more than half of the girls belong to the families having lower middle socio economic status.



SES of the Respondent

**Conclusion**

The results indicated that, there is significant gap between Recommended Dietary Allowance (RDA) and actual intake. It was found that the gap between RDA and actual intake in macro nutrients in terms of Calorie intake is 396 kcal, 2.938 gm in protein and 6.064 gm in fat. The gap between RDA and actual intake in micronutrient (vitamin-A) is 49.13 ug. The gap between RDA and actual intake in minerals are 220.78 mg in calcium and 1.97 mg in Iron. The result indicated that there was significant gap in nutrient intake. The study indicated that the mid-day meal programme can include healthy items in the menu as per the preference of children to decrease the wastage of food and to enhance the dietary intake as it provides a major portion of the total dietary requirement of the adolescent girls.

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