

Report on
Measuring the Impact of Mid- Day-Meal on Child Growth

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Executive Summary

The Akshaya Patra Foundation (TAPF) was set up in the year 2000 at Bangalore under the aegis of International Society for Krishna Consciousness (ISKCON) with a vision to ensure that no child in India is deprived of education because of hunger. The Akshaya Patra Foundation is a secular, charitable, not for profit organization and is one of the world's largest non-governmental organization (NGO) striving to end hunger and create a human resources pool that will propel India into the league of developed nations.

TAPF presently offers mid-day meal programs to almost a million under privileged children, below the age of 16 years, studying in 4,700 schools in 16 different locations in India and hopes to feed over 20 million children by 2020.

TAPF, a not-for-profit organization, came into existence being in the year 2000 to address two of the most immediate challenges of India - hunger and education. The foundation has gained considerable repute since then, for being a child-centric, secular organization with a focused approach.

The foundation began its work by providing quality mid-day meals to 1500 children in 5 schools in Bengaluru, with an understanding that the meal would attract children to schools, after which it would be easier to retain them and focus on their holistic development. Twelve years later, the foundation has expanded its footprint to cover 1.4 million children (enrolled strength) in 9 states across India. The foundation has a mission to reach out to 5 million children by 2020.

Akshaya Patra's Mid-Day Meal programme aims at the following,

1. Increased enrolment in schools,
2. Increased attendance in schools,
3. Reduced dropout rate, and
4. Improved performance of students in class in terms of better attention span and academic progress.
5. Improved nutritional status of students.

Review of literature on mid-day meals in India reveals that, several studies have been conducted in different parts of our country to measure the impact of mid-day meal on school enrollment, attendance, school dropout and academic performance. However very few studies have been conducted till date on assessing the impact of mid-day meal on nutrition level and child growth. Age and gender specific growth profile is a pre-requisite for promoting any intervention program which is presently absent. Therefore it is imperative to measure the impact of mid-day meals program nutrition level. Such impact measurement is also critical in the light of large number of children added to mid-day meal program which also brings complexities in food preparation and distribution. Highlighting gaps would help to improve the program further, as Akshaya Patra aspires to increase the number of children under this program to five fold. With this background, the present scientific study was conducted by Dr Ramachandra Kamath, Dr Ananthapadmanabha Achar and Mr. Bharath Shetty, from the Department of Public Health, Manipal University to measure the impact of mid-day meal on child growth

The main objective of the study was to measure the impact of mid-day meals on nutrition level and general health condition of the school children receiving mid-day meals. The study covered 75463 students studying in classes III to VII in 557 Schools from different regions of Karnataka viz Bellary, Hubli, Mysore Mangalore. For assessing the Nutritional status, standard measurements recommended by WHO were adopted. Anthropometrics tools such as -Standard Weighing Scales -Height Rod-A check list was used.

Major Findings

The study reveals that the overall prevalence of malnutrition among students was found to be 28%. Among them 19% were undernourished and 9% were found to be overweight/obese. It was observed that the problem of malnutrition was more among boys as compared to girls. 30% of boys were found to be malnourished. Among them 23% were found undernourished and 7% were found to be overweight/obese. Among girls, 25% were found malnourished. of which, 15% were undernourished and 10% were overweight/obese.

Undernutrition among girls was less as compared to boys. Overweight/obese were more among girls as compared to boys. There were region wise variations. In Bellary the prevalence malnutrition among children was high (33%), then followed by Hubli (26%). In Mangalore and Mysore the prevalence of malnutrition among children was found to be low. The attributing factors could be income status of the family, eating habits, awareness and literacy among parents etc. However this needs to be studied further. The general examination of children done by doctor revealed that 31% of children had dental caries, 8% children showed symptoms of pallor. The other common symptom reported was Vitamin A Deficiency among children.

The nutrition status of children receiving mid-day meals from TAPF was good as compared to with the studies done on the nutrition status other students. It is evident from the discussions in comparison with other studies. The study has helped in developing a school wise nutritional status database of children. This study will further help to conduct growth monitoring of children and also develop specific intervention to address the issue of malnutrition among school going children.

1. THE AKSHAYA PATRA FOUNDATION PROJECT PROFILE

The Akshaya Patra Foundation (TAPF), was set up in the year 2000 at Bangalore under the aegis of International Society for Krishna consciousness (ISKCON) with a vision to ensure that no child in India is deprived of education because of hunger. The Akshaya Patra Foundation is a secular, charitable, not for profit organization and is one of the world's largest NGO striving to end hunger and create a human resources pool that will propel India into the league of developed nations.

The history of the foundation starts with a story of compassion. Looking out of a window one day in Mayapur, a village near Calcutta, His Divine Grace A.C.Bhaktivedanta Swami Prabhupada, saw a group of children fighting with street dogs over scraps of food. From this simple, heartbreaking incident was born a determination that molded the beliefs of the foundation: No child within a radius of ten miles from the center should go hungry.

To achieve excellence in Foundation's governance, it has an independent board of trustees from professorial world and a board of advisors consisting of bureaucrats from government and eminent personalities form society. Mr Madhu Pandith Dasa, a post graduate in technology from IIT Mumbai is chairman of the board of trustees. Mr Chanchallapathi Dasa, graduate from IIT, Madras provides strategic direction for The Akshaya Patra Foundation (TAPF)

The day today affairs of the Foundation are professionally managed by a committed team, consisting of the Board of Trustees, Advisors, subject matter experts and volunteers. The Akshaya Patra Foundation presently has 2,300 employees who are led by 12 operational heads.

The Akshya Patra Foundation works on public – private partnership which is publicly funded and privately managed with world class technology. Both central and state governments contribute 50% of the running cost and balance is contributed by corporate, individual donors and philanthropists.

All contributions to the foundation is exempted form tax laws of India , United Kingdom and USA Akshaya Patra is approved under 35AC/80GGA (bb) of Income Tax in India, is registered with the Charity Commissions, UK 1117756 and 501(c) 3 organization in the United States of America Tax id # 01-0574950.

To ensure transference to the donors and supports of the Foundation, KPMG, a reputed consulting firm, provides advice in Accounting Standards and Services to the foundation. Auditors M/s BSR and Co, a renowned audit firm, audits the program for funds utilization, thereby ensuring transparency and high degree of accountability.

The Akshaya Patra Foundation presently runs two projects - The Akshya Patra and Vidhya Akshaya Patra for the holistic development of under privileged school children below the age of 16 years.

The Akshaya Patra Project (TAPP)

The Sanskrit word, Akshaya Patra (meaning abundant, inexhaustible) has its origin in the great epic - Mahabharata and aptly reflects the aspirations of the Founders to provide succor to a large number of less-fortunate children.

The Akshaya Patra Foundation presently offers fresh cooled mid-day meal daily to 1.3 million underprivileged children below the age of 16 years, studying in 9,000 government schools through 20 locations in 10 states across India and hopes to feed over 20 million children by 2020. Built on a public-private partnership, Akshaya Patra has supporting chapters in the United States, and UK. The programme is secular, inclusive and non-discriminating as it is provided only in Government schools that already have a secular policy for admission

Table 1 highlights the amazing growth of the Akshaya Patra midday meal program in different locations.

Table 1: Status of TAPP in India		
Locations	Number of schools	Number of children
Bangalore	533	1,45,000
Hubli –Dharward	647	1,54,000
Bellary	89	32,590
Mangalore	19	6,100
Jaipur	476	80,408
Baran	155	15,000
Nathdwara	134	12,300
Vrindvan	458	65,700
Puri	222	27,500
Source: Akshya Pthara Newsletter Vol. No.1		

Akshaya Patra partnered with the Karnataka government in 2003 under the mid-day meal scheme to act as one of the implementing arms of the government in many regions. It now works with central and state governments in 10 states (Karnataka, Andhra Pradesh, Assam, Chhattisgarh, Gujarat, New Delhi, Orissa, Rajasthan, Tamil Nadu and Uttar Pradesh) and has set up kitchens in 20 locations.

Assets such as state-of-the-art centralized kitchens are constructed and maintained across regions to ensure timely mass production of over 100,000 meals in most hygienic condition every day. Continuous R&D is taken up leading to innovations and improvisation of process. The kitchen would be set up in a small premises and food is cooked by a few employees from the local region, making whole process cost effective and generating other benefits such as women employment.

What distinguishes Akshaya Patra from other midday meal programs is the centralized kitchen approach, backed by technology driven process. In each region the capacity of the kitchen varies depending on the number of children to be fed. The customized kitchen is a mechanized marvel with a capacity to cook food for more than one lakh children simultaneously and also ensure quality.

Once the food is prepared, it is packed into tight-lid stainless steel containers and loaded into custom-built vehicles that ply on fixed routes to cater to the schools within a 50 km radius. Security personnel escort each vehicle to ensure safe delivery of meals to schools. The vehicles supply meals for about 20 to 25 schools per vehicle and on their return trip pick up empty containers.

Responding to the sensitivities of the community it is serving, the Akshaya Patra Foundation, in some areas like Baran in Rajasthan, has adopted an alternate approach of cooking and delivery of food. Whenever the situation demands, the Foundation has reached out to the entire community, believing that empowerment is the key to growth.

2.Introduction

Government of Karnataka launched its own Mid-Day Meal Programme and subsequently started involving NGOs in implementing the Programme. Government of Karnataka was the first in the country to make Mid-Day Meal a multilateral programme. Along with implementation, The NGOs are also engaged in designing and managing programs together with government. The Akshaya Patra Foundation, which successfully implemented its own feeding program in Karnataka, was called in to give testimonies for verifying the efficacy of the Government scheme, in order to successfully carry out this mandate. Akshaya Patra has a mission to ensure that ‘no child is deprived of education because of hunger.’ Currently, it feeds freshly cooked meals to more than 1.2 million children in various parts of the country and aims at feeding 5 million children by 2020.

Akshaya Patra’s Mid-Day Meal programme aims to achieve the following objectives.

1. Increased enrolment in schools
2. Increased attendance in schools.
3. Reduced dropout rate
4. Improved performance of students in class in terms of better attention span and academic progress
5. Improved nutritional status of students

3. Theoretical Background

3.1) What is Nutrition? According to WHO, nutrition is the intake of food, considered in relation to the body’s dietary needs. Good nutrition is an adequate, well balanced diet with regular physical activity. Poor nutrition can lead to reduced immunity, increased susceptibility to disease, impaired physical and mental development and reduced productivity.

3.2) How Nutrition Status is measured? The nutrition status among children is assessed by taking height and weight. Body Mass Index is calculated and Z scores are calculated. WHO

multi-centric growth charts is used to understand the severity of the nutritional status among children.

Body Mass Index (BMI) was calculated using the following formula.

BMI = Weight (For the same age as that of calculated individual)

Height x Height (meters)

Then Z scores were calculated for each individual using the formula

Z = Calculated BMI- Median (For the same age as that of calculated individual)

Standard deviation

Note: Median BMI used in above formula has been taken from the WHO 2007 Mutli centre Growth Reference study charts.

TABLE 2: WHO STANDARDS FOR NUTRITIONAL STATUS

Nutritional Status	Confidence Interval	Value
Normal	95%	+ 2SD to – 2SD
Thinness	95%	-2SD To – 3SD
Severe thinness	95%	Less than -3 SD
Overweight	95%	More than +1 SD
Obese	95%	More than + 2 SD

Prevalence of overweight with 95% Confidence Interval (more than +1 SD), Obesity with 95% Confidence Interval (More than +2 SD), Thinness with 95% Confidence Interval (-2SD to -3SD), severe thinness with 95% Confidences Interval (less than -3 SD), Thinness with 95% Confidence Interval (-2 SD Through -3 SD) and Normal with 95% Confidence Interval (+ 2SD Through -2 SD)

3.3) Importance of Nutrition among children: Nutrition plays a vital role in the growth and development of children. The school age period is nutritionally significant because this is the prime time to build up body stores of nutrients in preparation for rapid growth of adolescence. An inadequate nutrition during childhood may lead to malnutrition, growth retardation, reduced work capacity and poor mental and social development]. In children, protein/calorie deficient diet results in underweight, wasting and lowered resistance to infection, stunted growth and impaired cognitive development and learning.¹

3.4) Malnutrition refers to deficiencies, excesses or imbalances in intake of energy, protein and/or other nutrients. Contrary to common usage, the term '*malnutrition*' correctly includes both under-nutrition and over-nutrition. *Under-nutrition* is the result of food intake that is continuously insufficient to meet dietary energy requirements, poor absorption and/or poor biological use of nutrients consumed. This usually results in loss of body weight. *Over-nutrition* refers to a chronic condition where intake of food is in excess of dietary energy requirements, resulting in overweight and/or obesity. There are two types of Malnutrition one is **Protein Energy Malnutrition (PEM)** and other one is **Micronutrient (vitamins & mineral deficiency)** malnutrition.

3.5) Problem of Malnutrition in India: In India 21% of total population (207 million) is suffering from hunger and under nourishment. Hunger is an extreme manifestation of poverty and is the root cause for illiteracy, ill-health and unemployment. Hunger and malnutrition during the formative years impairs cognitive development, thus permanently cripple an individual for life Hunger is a stumbling block for education that locks poor children In India 21 percent of total population (207 million) is suffering from hunger and under nourishment. Hunger is an extreme manifestation of poverty and is the root cause for illiteracy, ill-health and unemployment. Hunger and malnutrition during the formative years impairs cognitive development, thus permanently cripple an individual for life (Saroja Prabakaran, 2004). Hunger is a stumbling block for education that locks poor children into a vicious circle: hunger and poverty force the children to drop out of school and take up menial jobs. Lack of education

curtails opportunities for gainful employment. Unemployment puts them back on the track of poverty and hunger. Therefore, it is indispensable to address children's hunger; otherwise, they will remain illiterate, missing out on the benefits of education. In sum, the biggest development challenge for India is to provide equitable access to food, education, jobs and healthcare to poor and harness the wealth of human potential.¹

3.6) Response from the Government and Non-Government Organizations: To address the issue of malnutrition among children, government has introduced Mid-Meal Programs in all the government schools. The objective of this program is to improve the nutrition status among school going children. Non-governmental Organizations also joined hands with government and started implementing mid-meal program. Review of literature on the study of impact of mid-day meals conducted in several parts of India revealed following findings. The study carried in the elementary school in Chandigarh in the year 2010 to understand the impact of mid-meal on the children enrollment in the school. It was observed that there were 22% increase in the enrollment of children after introducing Mid-day Meal (MDM) in school. An evaluation of the ongoing mid-day meal program in primary schools of Chhattisgarh state. The objective was to study the impact of scheme on enrollment, attendance and nutritional status of children. The sample schools were selected from all 16 districts of the state. A total of 5770 school children were surveyed from 580 schools that were availing the mid-day meal scheme. Surprisingly, >92% of children responded that the mid-day meal is better than home cooked food. Only 5 to 6 % children responded that the food is not better than home because there is no variety in food, sometimes food is cold, rice is not cooked well. It was also found that no precautionary measures are taken for maintaining hygiene while serving the food. The study done in Vadodara in the year 2011 was assessed the nutritional status of children in rural school having MDM (Mid-day Meal). It was found that 70% of children were underweight, stunting was evident in 32% of girls and 31% in boys and 27% of the had symptoms of nutritional disease vitamin A deficiency (8%) and Iron deficiency (33%). Several studies were carried out on the impact of MDM on school enrollment, attendance, school dropout and academic performance. However very few studies have been conducted on the impact of MDM on children nutritional status and growth.

Age and gender specific growth profile is a pre-requisite for promoting any intervention programme which is presently absent. Therefore it is imperative to measure the impact of mid-

day meals programme on the nutrition level of children. Such impact measurement is also critical in the light of large number of children added to mid-day meal programme which also brings complexities in food preparation and distribution. Gaps if any would certainly help to improve the programme further, as Akshaya Patra aspires to increase the number of children under this programme to five fold. In this context the Department of Public Health of Manipal University, Manipal had conducted an independent study on measuring nutrition status of children receiving mid-day meal in the state of Karnataka.

2. Research Design

4.1 Scope of study

At present The Akshaya Pathra foundation is offering mid-day meals to around 5.4 lakh children in 2421 schools in 5 five districts of Karnataka viz Bengaluru, Mysore, Mangalore , Hubli – Dharwad and Bellary. The study covered children studying in class 3rd - 7th standard, of four districts of Karnataka namely, Mysore, Mangalore, Hubli –Dharward and Bellary.

4.2) Objectives

The main objective of the study was to measure the nutritional status of children who were receiving mid-day meals and also to assess the general health condition of the school children receiving mid-day meals. The specific objectives of the study were

- To develop age and gender specific growth profile of children receiving hot cooked meal from Akshaya Patra,
- To identify nutritional gaps if any, in the present system and suggest corrective action in child growth
- To sensitize the teachers on the nutritional status of children receiving mid-day meals in the school.

4.3) Sample size

The sample size of the study was limited to 25% of the total children (75,463) studying and 10% of total schools (557 schools). In any sampled school, the sample size was not to be less than 50 and number of boys and girls were selected in proportion of their population in the sampled schools. The distribution of sample is provided in Table-3

Table 3 Sample Distribution

Name of the Districts	No of Schools	Boys	Girls	Total
Hubli	359	20395	22839	43234
Bellary	169	13519	14025	27544
Mysore	18	1500	1555	3055
Mangalore	11	800	830	1630
Total	557	36214	39249	75463

4.4 Data collection

The data for the study was collected by primary and secondary sources.

The primary data for the study was collected by a team of Medical Doctors (one senior medical doctor and two junior doctors) by clinical examination of every child in the sampled school. SECA machine was used to measure Height and Weight of the children.

Further, academic performance and student's perception regarding supply of mid-day meal were collected by administering a structured questionnaire.

Secondary data for the study was collected by referring relevant journals, studies and magazines in the field of study.

Field survey data was collected during Jan2011 - March 2012.

4.5 Data Analysis and Interpretation:

Statistical Package for Social Sciences (SPSS16.0) and Growth charts –MGRS (Multi centre Growth Reference Study) recommend by WHO were used to assess the nutritional status of the children.

5 Results of the Study

Nutritional Status of Children:

Figure 1: Overall Nutrition Status of Boys and Girls (Percentage).

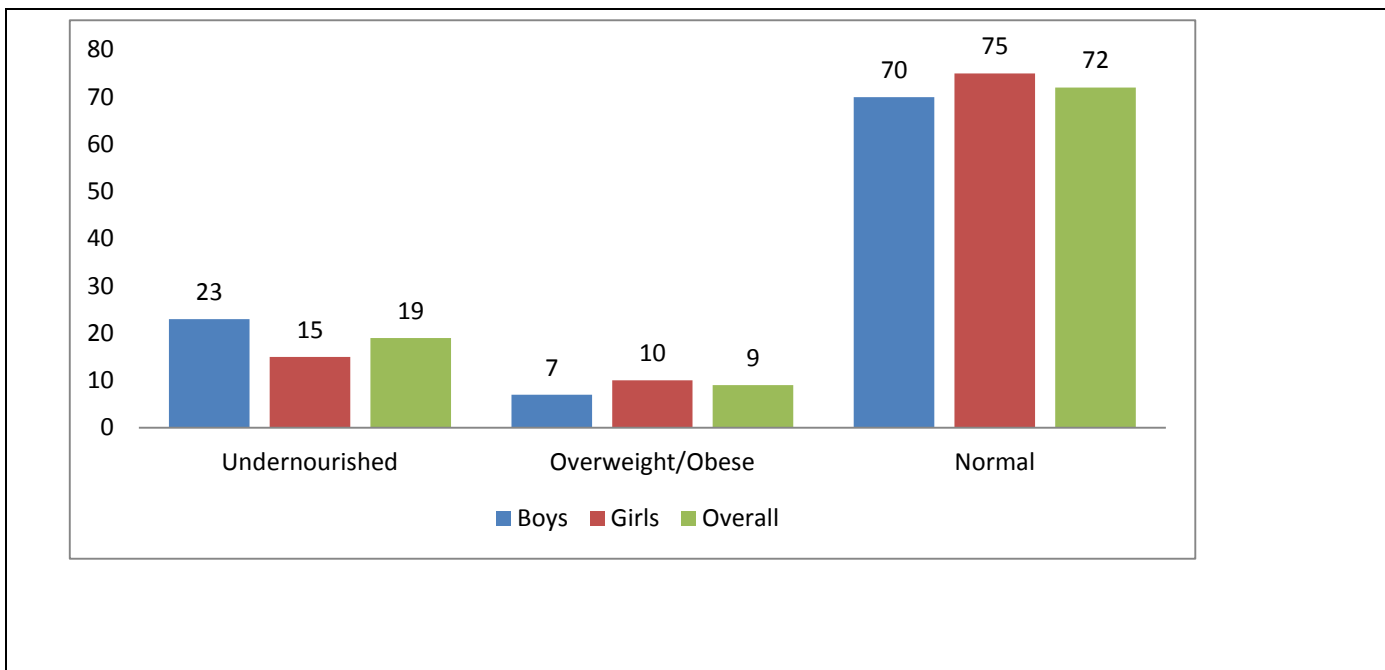


Figure 2: Nutritional Status of Boys and Girls in Hubli (Percentage)

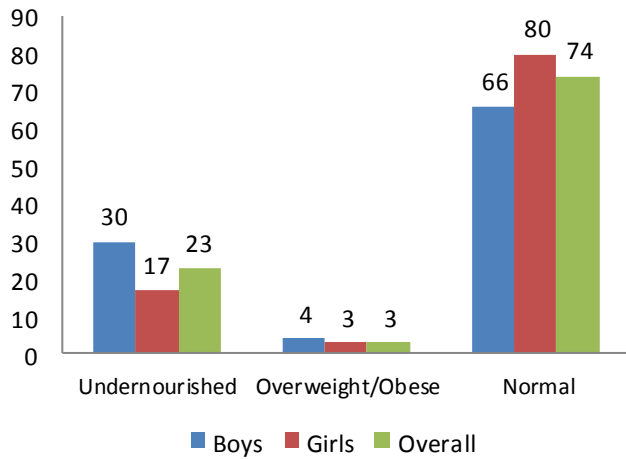


Figure 3: Nutritional Status of Boys and Girls in Bellary (Percentage)

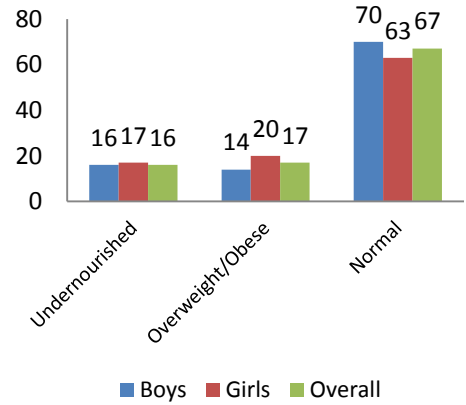


Figure 4: Nutritional Status of Boys and Girls in Mysore (Percentage)

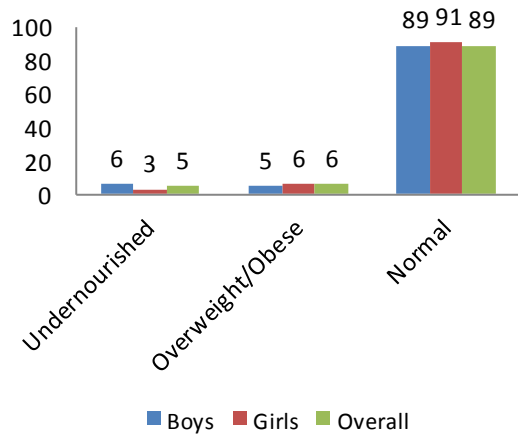
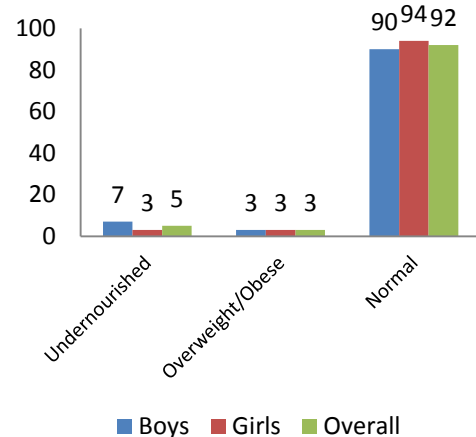


Figure 5: Nutritional Status of Boys and Girls in Mangalore (Percentage)

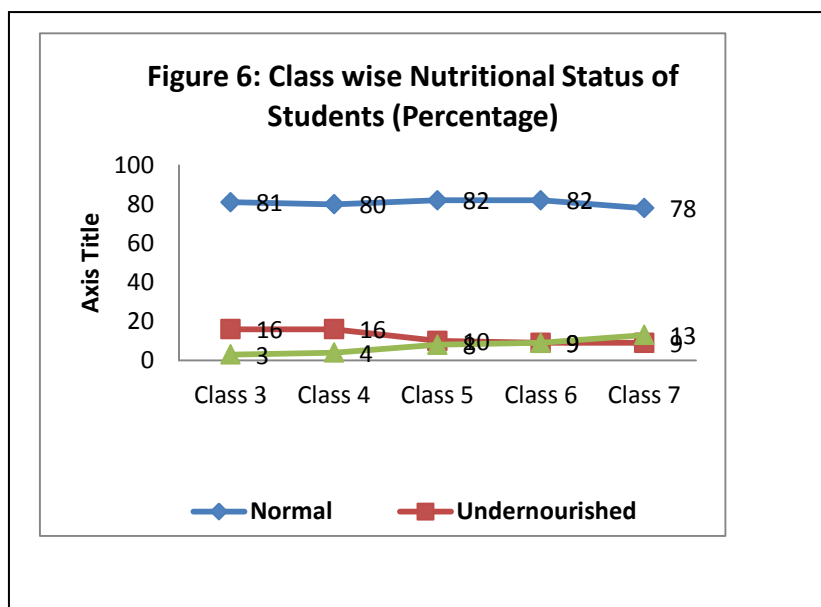


The study findings revealed overall 28% of children were found malnourished as shown in Figure 1 above. Among them 19% of them were found undernourished and 9% of them were overweight/obese. The gender wise nutritional status reveals 23% boys and 15% of girls were

found undernourished and 7% of boys and 10% of girls were found overweight and/ obese. Undernourishment was found more among boys than girls. The district wise data on nutritional status of children revealed following findings. In Mangalore and Mysore district the nutritional status of children were found good when compared to Bellary and Hubli.

It was observed that in Bellary more number of children were found malnourished then followed by Hubli. In Bellary the prevalence of malnutrition was 33% then followed by Hubli 26%. In Bellary 20% of girls were found overweight/obese and Undernutrition among boys was found more i.e. 16%. The socio-economic status of parents in Bellary and Hubli is low as compared to Mysore and Mangalore. Another reason for the poor nutrition status may be due to the past history of malnutrition among boys and girls in Bellay and Hubli.

5.1) Nutritional Status of Children class wise



The nutrition status of children was analysed, class wise for both boys and girls. It was observed that children who were studying in the higher class (i.e. class 6 and 7) and age group between (12- 13 years) were found less undernourished as compared children who were studying in the lower classes (class 3 and 4) and younger age group (8-10 years). It was also observed in Bellary, more number girls were found overweight/obese. This was observed more among higher age groups (12-13 years). The prevalence of undernutrition among children in lower class was high may be due to past history of Undernutrition (because according to NFHS 2006 data, In

India 46% children were undernourished). The Undernutrition among children in the higher class was found less and overweight/obese was found more. This could be due to following reasons: 1) Improved eating habits and also due to physiological changes among children as they grow-up. 2) Children who have received mid-meal over a period of time might have resulted in improving nutritional status however this needs to be further studied considering other contributing factors.

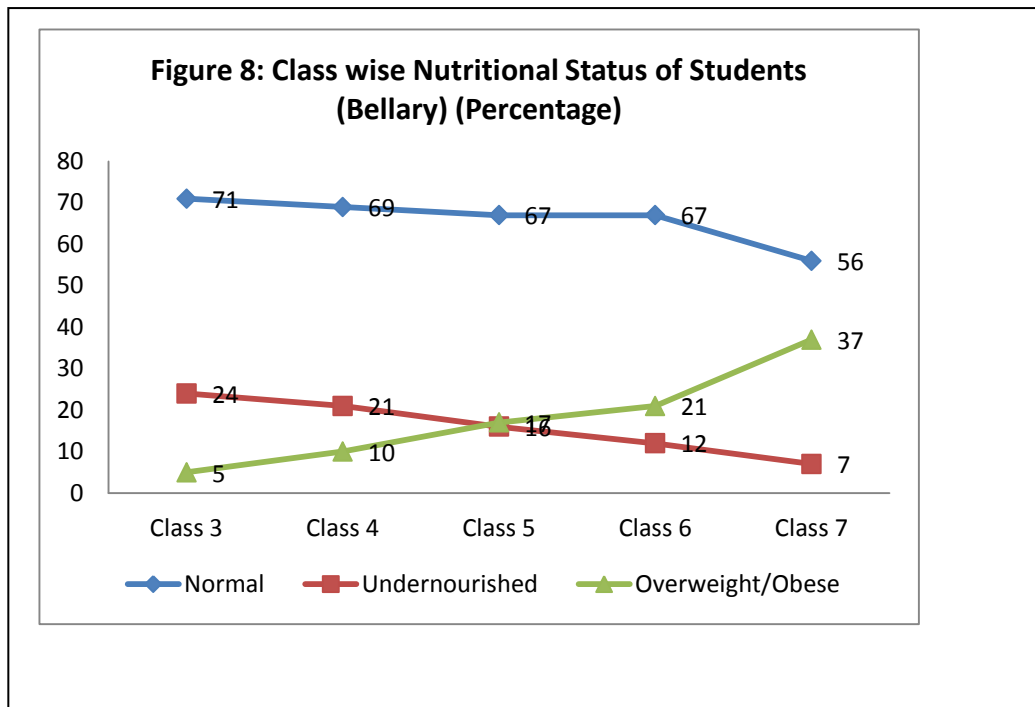
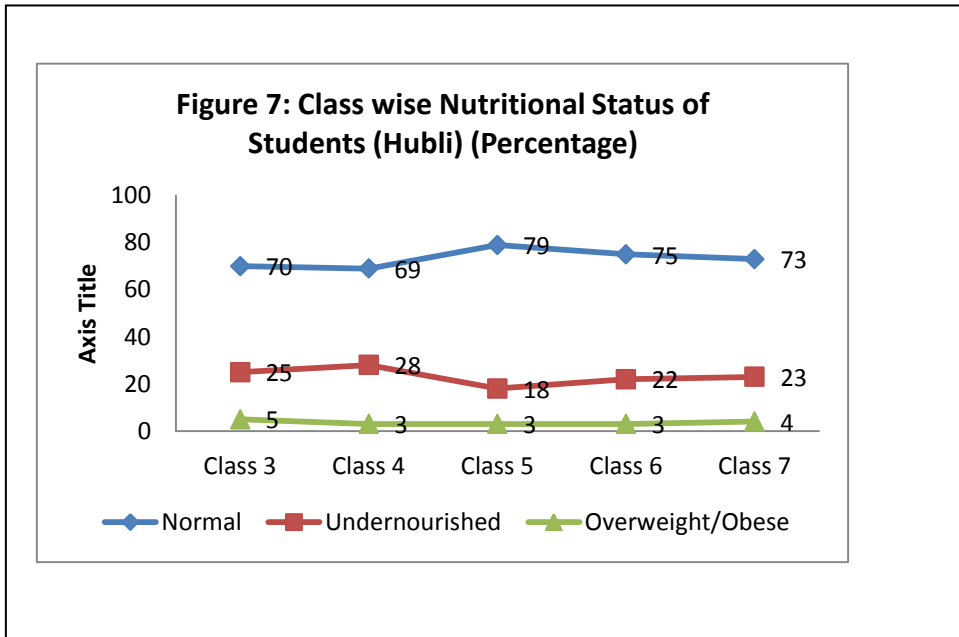


Figure 9: Class wise Nutritional Status of Students (Mysore) (Percentage)

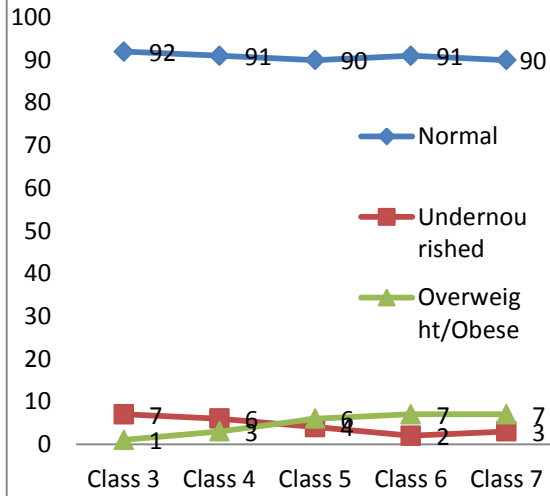
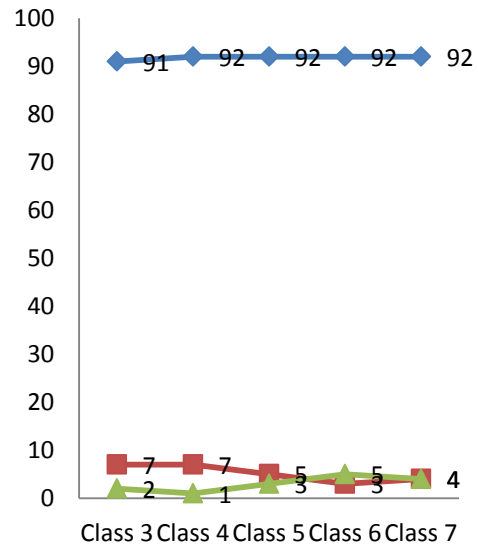
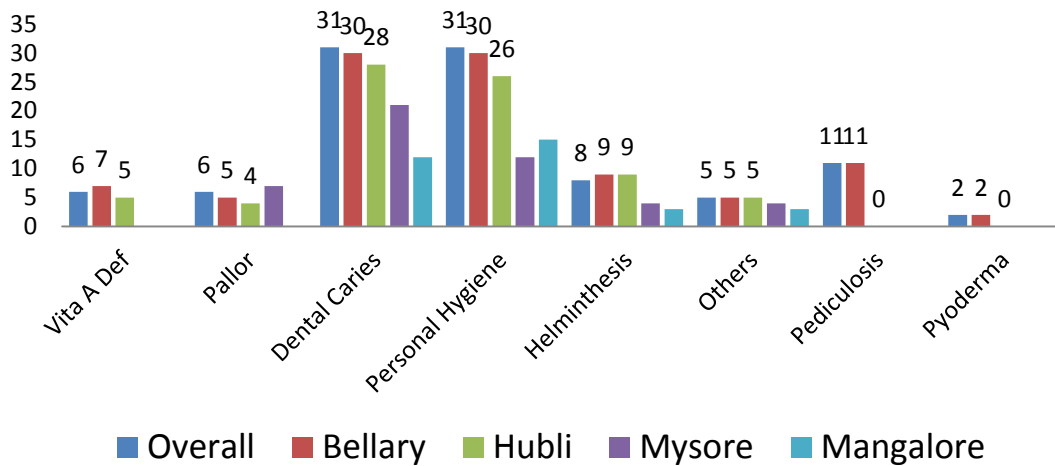


Figure 10: Class wise Nutritional Status of Students (Mangalore) (Percentage)



5.2) Nutritional Deficiency Symptoms, Personal Hygiene and Dental Caries

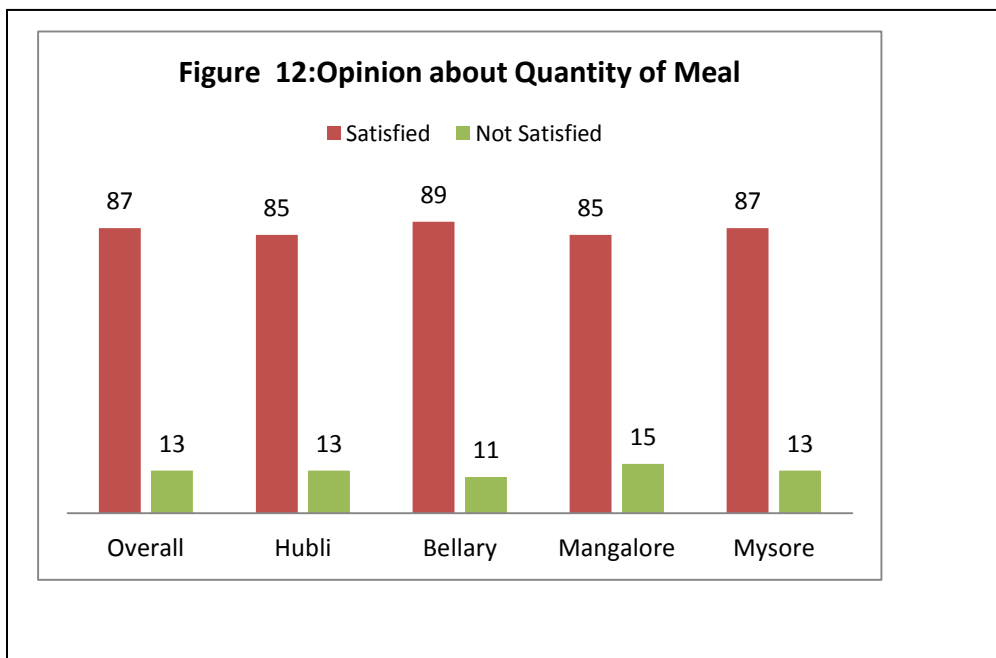
Figure 11: Nutritional Deficiency Symptoms, Personal Hygiene and Dental Caries



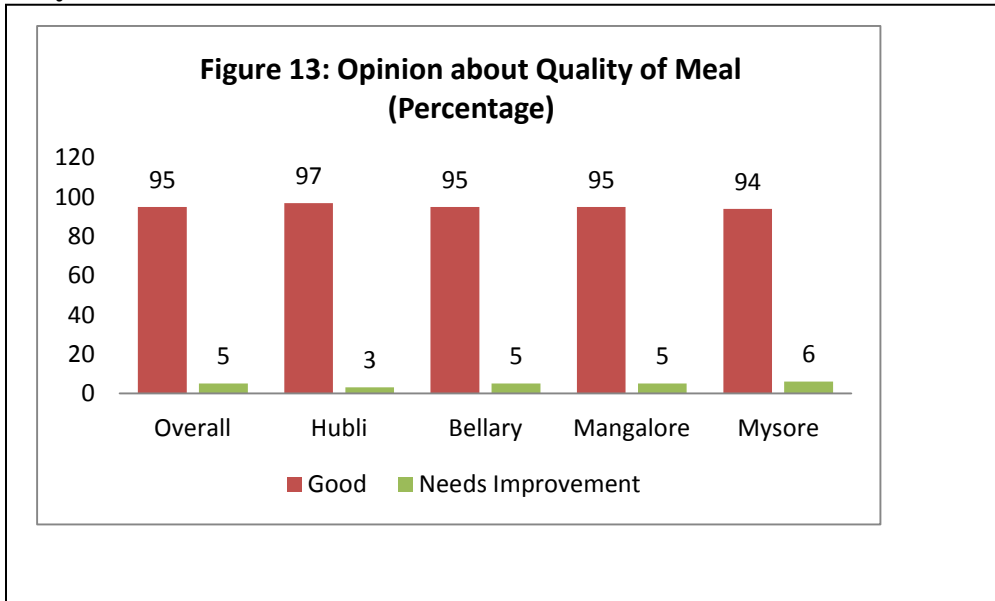
It was observed that 31% students had poor personal hygiene, 31% of students had dental caries and 11% had pediculosis. Furthermore, symptoms related to nutritional deficiency were pallor (6%), vitamin A deficiency (5%) and helminthiasis (8%). The nutritional deficiency symptoms were more observed among students in Bellary and Hubli as compared to Mangalore and Mysore. It is also evident that more number of children were found malnourished in Bellary and Hubli. Similarly poor personal hygiene and dental caries were more seen among students in Bellary and Hubli.

5. 3) Children’s Opinion about Mid-Day Meals

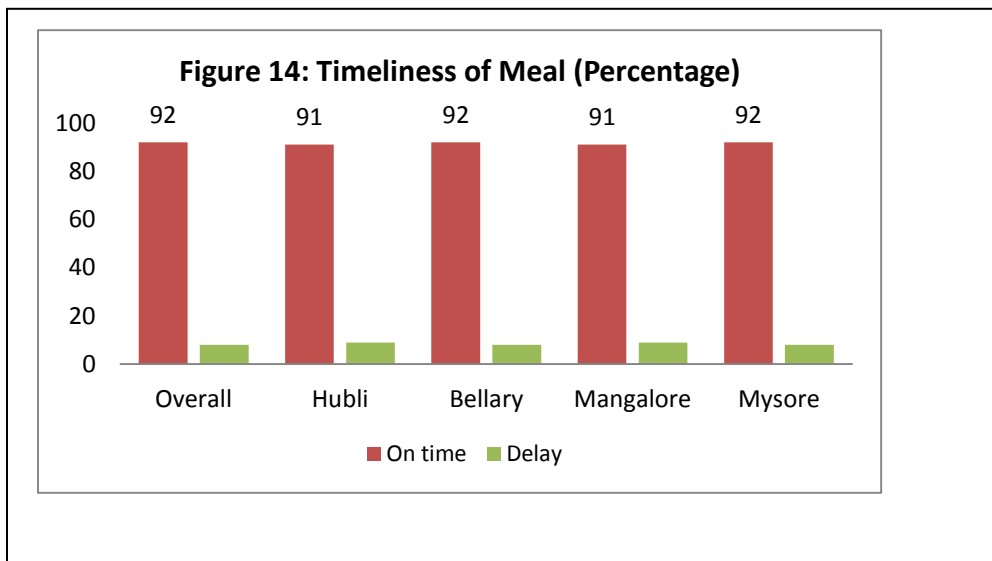
a) Quantity of Meal



b) Quality of Meal



c) Timeliness of Meal



The analysis on this, elicited good response on the meal. 87% of students expressed that they were satisfied with the quantity of meal, 13% students expressed un-satisfaction on the quantity of meal. 95% of students have expressed that the quality of food is good, 5% have expressed that quality of food needs to be improved. Regarding timeliness of meal 92% of the students expressed that they get food on time, only 8% of reported that sometime the food is delayed. Overall, the children had a favorable opinion about the mid-day meals.

6) Discussions

The present study revealed malnutrition was prevalent among the children who are receiving mid-day meals from TAPF. The findings this study was compared with other studies done on the nutritional status of children (similar age groups) in the Indian context. It was observed that the nutrition status of children who are receiving mid meal from TAPF was good in comparison with other study findings as discussed below.

The study conducted in the villages of Dharwad and Haliyal taluks reported 44.4% of children as underweight.³ The record base study carried out in Pakistan among same age groups (5-14 years) from two independent population-based representative surveys, the urban component of the National Health Survey of Pakistan (NHSP; 1990–1994) and the Karachi survey (2004–2005) revealed out of 2074 from urban NHSP and 1675 from Karachi survey, prevalence of underweight children was 29.7% versus 27.3% (p=0.12), stunting was 16.7% versus 14.3% and prevalence of overweight and obese children was 3.0 versus 5.7 (p,0.001) in the NHSP and Karachi surveys, respectively.⁴ Similar study was done among school going children (5-11 years of age) in Meerut in the year 2007 has revealed the prevalence of malnutrition among children was 49% which was quite high.⁵ A study done among Jenukuruba tribal children by Prabhakar *et al* also revealed high prevalence of mild (41.5%) and severe (6.7%) stunting and high prevalence of mild (40%) and severe (3.7%) wasting; they also reported 45.2% of children as having moderate underweight and 14.8% as having severe underweight. These figures indicate a higher prevalence of under nutrition than in our study population. A study done recently among 500 children of government schools of Azad Nagar, Bangalore revealed the prevalence of malnutrition was 68% and it was relatively high among boys (57.94%) than girls (42.06%).⁸ The study carried out in Goa “Undernutrition among adolescents” which was carried out in 5 secondary schools (10-19 years of age n= 338) also revealed, malnutrition among them and it was observed more among boys than compare to girls.⁹ At a country level, therefore, past prevalences of child malnutrition—regardless of current environmental factors—are likely to have an independent, numerically positive, effect on current prevalence. According to WHO close to 70% of children have a past history of Undernutrition.¹⁰

The children at the lower class were found more undernourished, however, as the age advanced more number of children were found to have normal nutrition. The study done by Jayalaxmi

(1990) has also reported as the age advances the vulnerability to Nutritional stress decreases due slow pace of physical growth and better eating habits. The study done in Vadodara in the year 2011 was assessed the nutritional status of children in rural school having MDM (Mid-day Meal). It was found that 70% of children were underweight, stunting was evident in 32% of girls and 31% in boys and 27% of had symptoms of nutritional disease vitamin A deficiency (8%) and Iron deficiency (33%). In another cross sectional study carried out among “Urban Meitei” children and adolescents (854 subjects) of Manipur in 2009 shown high prevalence of underweight (30.21%) and obese./overweight (3.12%).¹¹ The prevalence if underweight was more among girls than boys. The study also elicited problem of Undernutrition and overnutrition among children which was similarly observed in the current study.

An evaluation of the ongoing mid-day meal program in primary schools of Chhattisgarh state. The objective was to study the impact of scheme on enrollment, attendance and nutritional status of children. The sample schools were selected from all 16 districts of the state. A total of 5770 school children were surveyed from 580 schools that were availing the mid-day meal scheme. Surprisingly, >92% of children responded that the mid-day meal is better than home cooked food, which was similarly observed in the present study

Various studies have concluded that the problem of malnutrition among school going children was more among lower age groups, the underlying cause may be due past history of malnutrition or due to poor eating habits and also due low socio-economic status. Another key finding in the present study was, the prevalence of Undernutrition was more among boys than compare to girls and it is evident from other studies done among the school children and reference for the same is quoted above in the discussion.

7) Implications

7.1) Nutrition Status: Mid-Day Meal program has five objectives as mentioned above. Till date, very few studies have been done on the impact of mid-day meal on children growth and their Nutrition status. This study is useful in understanding nutritional status of school going children and also to take necessary intervention to address the issue of Malnutrition (undernutrition and overweight/obese among children).

7.2) Baseline Data on Nutrition Status of Children: The study provided baseline data on the Nutritional Level of children receiving mid-meal provided by Akshaya Patra in the sampled schools. The baseline data includes individual id of the children along with school code and their nutritional status. This will be useful in individual tracking of children to improve the nutrition status

7.3) Nutrition Related Illness and Health problems: Along with the Nutrition Status of children, the study also elicited nutritional related health problems like Vitamin A deficiency, pallor, worm infestations and also issues of personal hygiene and dental caries among children which needs major attention.

8. Recommendations

1. Regular assessment of Nutrition and Health status of children should be carried out. It is imperative that a school authority carries out this activity in co-ordination with the health department.
2. The study provided a list of children with Nutritional Status. It would be good if children with low and over nutrition were monitored to ensure normal nutritional status.
3. Develop a database of socio-economic status of the parents children receiving mid-meals and further study can be done on the nutritional status.
4. The study elicited in all four districts the prevalence of obesity and overweight was seen among boys and girls. This could be due to abdominal obesity, however this need to be further explored by carrying out research study and appropriate intervention can be developed to overcome this issue.
5. Special emphasis need to be given in the school on the importance of Nutrition on health. Teachers have to play a proactive role and conduct debates, quiz and essay writing on nutrition and its importance for the students.

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