

## Impact of midday meal programme among the primary school going children: a Comparative Nutritional study

*Suchorita Ghara, Kabita Jana, Rubi Adak & Dr. Santanu Panda*

### Abstract

Nutrition is the science that interprets the interaction of nutrients and other substances in food in relation to maintenance, growth, reproduction, health and disease of an organism. It includes food intake, absorption, assimilation, biosynthesis, catabolism and excretion. Nutritionist and dieticians are health professionals who create diets for people. Teaching patients about health eating is a primary duty, as well as staying aware of developments in medicine and nutrition. However, there is a difference between dietetics and nutrition: **dietetics focuses on food management**, whereas **nutrition focuses on the promotion of health through healthy food**. So, without fieldwork community nutrition assessment is not possible. The National Programme of Nutritional Support to Primary Education which is popularly known as the Mid-day Meal Scheme was launched by the Government of India in 1995 with the objective of giving a boost to universalisation of primary education by increasing enrolment, attendance and retention and simultaneously improving the nutritional status of students in primary classes. It is the flagship programme in

India to reduce malnutrition and mortality rate as well as enrich the enrolment of schooling. The study revealed that now a day in tribal village's mid-day meal is very much important to prevent under nutrition and malnutrition. Protein Energy Malnutrition (PEM) is the most important nutrition problem globally which is more severe in third world countries affecting children of 20-80 percent of primary school going are suffering from nutritional deprivation. Most of the tribal families are belonging to Upper Lower (IV) socio-economic class, whereas among the non-tribal are Lower Middle (III) socio-economic class. It is concluded from the study that the nutritional status of Lodha tribal children of Paschim Midnapur is very poor. Nutritional statuses of Non-tribal school going children are better than tribal but still both are not consume enough nutrients according to their requirement. Both tribal and non-tribal suffered under weight, some of them are suffering malnutrition.

**Keywords:** Mid-day meal scheme, nutrition, universalisation, CARE

### Introduction

**Historical background of mid-day meal programme**

Midday meal programme is the popular name for the school meal programme in India. It involves provision of lunch/snacks/meal free of cost to school children on school working days.

The key objectives of the programme are:

- ❖ Protecting children from classroom hunger,
- ❖ Increasing school enrolment and attendance,
- ❖ Improving socialisation among children belonging to all castes,
- ❖ Addressing the issue of malnutrition among children and
- ❖ Social empowerment of women by creating employment.

Mid day meals, as a public welfare concept in India, dates back to 1925 when such a project was launched for the underprivileged children in the then Madras Corporation area. One of the pioneers, Madras Corporation started providing cooked meals to children in Corporation schools in the Madras city; the programme was later introduced on a larger scale in 1960s. Tamil Nadu's mid-day meal programme is among the best known in the country. The programme was introduced at a national level by the government of India in the late 50s and early 60s and later in the 80s as a centrally sponsored programme. Besides Madras, several other states/cities of India too have had the mid-day meal programme prior to the Government of India's initiative. In 1928, Keshav Academy of Calcutta introduced compulsory Mid-Day Tiffin for school boys on payment basis at the rate of four *annas* per child

per month. A school lunch programme was started in parts of Kerala in 1941; followed by Bombay implementing a free mid-day meal scheme in 1942, who with UNICEF assistance distributed skimmed milk powder to children aged between 6-13 years. Another project was launched in Bangalore city in 1946 where the scheme provided cooked rice with curds to the children. In 1953, Uttar Pradesh Government introduced a scheme, on voluntary basis, to provide meals consisting of boiled or roasted or sprouted grams, ground-nut, puffed rice, boiled potatoes or seasonal fruits. Several states introduced such schemes during 1950s, with the aid of international agencies like the UNICEF, FAO and WHO. An Expanded Nutrition Programme was launched jointly by the Government of India and the FAO, WHO, UNICEF during 1958-59, which subsequently developed, into the Applied Nutrition Programme (ANP). Under this, demonstration feeding programmes for the school children wherein nutritious food was cooked by the women groups and fed to the children under the nutrition education component. [1, 3]

The idea of a National Mid-Day Meal Programme had been considered again and again for over a decade. In 1982, the idea of 'Food for Learning' with FAO commodity assistance was mooted. Scheduled Caste (SC) and Scheduled Tribe (ST) girls were to be covered under this programme.

In 1983, the Department of Education of the Central Government after inter-ministerial consultations, prepared a scheme as per the guidelines of the World Food Programme (WFP).

According to this scheme 13.6 million SC children and 10.09 million ST girls in classes I-V were to be covered in 15 states and 3 Union Territories, where the enrolment of SC /ST girls was less than 79 percent. The proposal was circulated among states and Union Territories (UTs). While many states expressed their willingness to implement the programme, others reported that there were some practical difficulties in implementing a mid day meal programme meant exclusively for SC and ST children particularly continuing when WFP assistance was withdrawn.

A programme with Central Government assistance for mid day meal for the benefit of children enrolled in primary schools throughout the country was considered during 1984-85, the rationale for the programme were:

- ❖ The Mid Day Meal Programme for primary schools could form the basis of an anti-poverty educational programme.
- ❖ Implementation of this programme for the children aged between 6-11 years may maximize enrolment and reduce school dropout rates, which were important from the viewpoint of universalisation of elementary education as well as achievement of higher literacy rates in the country. [2]

***The broad features of the programme were***

- ❖ Supplying of food items providing 300 calories per day and 12-15 g protein per child with coverage of primary school children in a phased manner.

- ❖ Expenditure per child per day including expenses on administration to be 60paise.
- ❖ No elaborate administrative infrastructure to be built up.
- ❖ Funds required for the programme to come from provisions marked for poverty alleviation scheme.
- ❖ States should evolve suitable logistics and make arrangements for cooks, helpers, administration, supervision and monitoring.

In December 1988, the Department of Education formulated a proposal for covering 994 ICDS blocks with concentration of SC/ST children @ Rs.1/- per child per day. The important element of this scheme was:

- The scheme should cover all children in primary classes in government and local body schools.
- Mid day meals should be provided on all working days.
- CARE assistance, if any, should be excluded.
- Cereals and to the extent possible pulses, edible oils and condiments should be supplied to the schools through authorized state agencies.

In 1990-91, seventeen State governments were implementing the programme for primary school children between the age group of 6-11 years with varying degrees of coverage. Twelve states namely Goa, Gujarat, Kerala, Madhya Pradesh,

Maharashtra, Meghalaya, Mizoram, Nagaland, Sikkim, Tamil Nadu, Tripura, and Uttar Pradesh were implementing Mid Day Meal Programme from their own resources. In three states namely Karnataka, Orissa and West Bengal, the programme was implemented partially with assistance from CARE. As reported by Ministry of Human Resource and Development, thirteen States and five Union Territories were administering mid day meal programme as of December 1994. [1, 4]

- Improve nutritional status of the primary school children and
- Inculcate good food habits in children.

The programme envisaged the provision of cooked meals/ processed food of calorific value equivalent to 100g of wheat /rice for children studying in classes I-V in all Government, local body and Government aided primary schools free of cost. This recommendation was based on a study done by NNMB (1990-92) on dietary consumption patterns of rural children using a one-day 24-hour recall method. It was observed that the children had a deficit of the magnitude of 628 kcal and 6-7g protein in the daily diets. From the nutritional angle, the endeavor should be to bridge the average nutritional gap of 600 kcal through a balanced diet of cereals, pulses, fats and vegetables; the cereal component could be to the order of 60-90 percent of the calorie deficit or roughly 100g of food grains / child / day.

The programme which started in August 1995 has seen all India coverage in 1997-98 and the coverage of children under the programme has increased from 3.4 crores in 1995-96 to 10.5 crores in 2003-04 in about the same number of schools. However there were a lot of variations over the years with regard to implementation.

The coverage of more than 12 crore children in rural and urban areas under the scheme makes the mid day meal programme one of the largest nutrition support schemes in the world. [2, 3]

Midday Meal Programme (MDMP) is also known as school lunch programme was launched by

### ***The present scenario of the Programme***

MDMP - 'Nutrition Support to primary education' is considered as a means of providing free and compulsory universal primary education of satisfactory quality to all children below the age of 14 years.

A National Programme of Nutritional Support to Primary Education commonly known as MID DAY MEAL PROGRAMME (MDMP) was re-launched by the then Prime Minister of India on 15th August 1995. It was aimed at improving enrolment, attendance and retention, while simultaneously improving the nutritional status of students in primary classes. Universalisation of primary education being our national goal, MDMP was launched with the following objectives:

- Increase enrolment, improve school attendance as well as retention,
- Promote social integration,

Ministry of Human Resource Development during 1955-1996 by Madras State in order to compact malnutrition and improve the health status of student of primary school. It was operated as nutritional supplementary programme in all over the advance countries since 1962-1963. Those who can afford it may bring their lunch packets from home and during lunch hours take their meal in school.

**The Specific Objectives of the Programme are**

- To improve the nutritional status of primary school children belonging to low socio-economic status
- To attract school enrolment and regular attendance and
- To impart nutrition education by providing a free meal in the school to serve as supplementary nutrition.

The beneficiaries under the programme are the primary school children (6-11) years of age. The specific activities carried out under the scheme are to provide ready to eat food. The programme provides a free meal having 300 Kcal and 10-15 gram protein per day for 210 days in year. Under the programme there is provision of cooked meal or processed food for children in class 1-V in all government and aided primary schools. One of the school teachers is assigned the responsibility for implementing to the state for financial support and implementation, the programme became irregular. In view of the inadequate production and storage of the food grains in the countries, Prime Minister launched a central scheme on 15<sup>th</sup> August, 1995 to provide nutrition support to primary school children. The objectives and operations of the

MDMP remind the scheme. Under the programme central assistance is available for reimbursement of cost of food grain and transport charges from Food Corporation of India good own to school but the government of India pays 40% of total expenditure and 60% of borne by state. Wheat or Rice 3 Kg per month per children is distributed where arrangements for provision of cooked meals have not yet been made.

The number of the children covered under this programme had increased for 33.4 million in 1995 to 1996 105.1 million and spread in 79,200 schools covered 576 districts in 2001-2002. Evolution by agencies has shown that this scheme had improved the schools enrolments. The concept of midday meal has a long history in India. In 1925 a meal programme was introduced for children belonging to poor socio-economic status in Madras Corporation Area (Nandi Foundation-2006). In 1928 Keshab Academy of Kolkata introduced compulsory midday Tiffin for school boys on payment basis at the rate of 4 annas per child per month. Thereafter in 1950, many state governments came to introduce the MDMP with assistance of different international agencies like- UNICEF, FAO, WHO, CARE (Cooperative for American Relief Everywhere) etc. also came forward to assist in this programme (1991).

In 1990-1991 a few states such as Tamil Nadu and Gujarat already provided cooked midday meal in primary school before the Supreme Court order (November 28, 2001). Other states were just providing “dry rations” (usually 3 Kgs of grain per child month) under the national programme of

nutritional support to primary education initiated in 1995. [4]

Under the programme, state government were actually support to start cooked midday meal. But most of them never went beyond “dry rations”, until the Supreme Court intervened. After 2001, 17 states government was implemented MDMP for primary school children between the age group 6-11 years varying degrees of coverage. 12 states namely-Goa, Gujarat, Kerala, Madhya Pradesh, Maharashtra, Meghalaya, Mizoram, Nagaland, Sikkim, Tamil Nadu, Tripura and Utter Pradesh were implemented the MDMP from out of their own resources. In three states namely-Karnataka, Orissa and West Bengal, the programme was being implemented partially from out of their three own resource and partially with the assistance of CARE. Two states- Andhra Pradesh and Rajasthan were running the programme only with CARE assistance. [5]

According to information revolved form the planning commission, 13 states and 5 Unions were administrating MDMP as of 31<sup>st</sup> December 1994. In all, 20.481 million children, Tamil Nadu covered 36.16 per cent of all coverage in the country and West Bengal coverage 17.57%.

### **Objectives of School Health Programme:**

#### **1) About the programme**

MDMP is the popular name given to the national scheme launched on 15<sup>th</sup> August 1995. A combination of factor made the programme possible, it was through that a meal of lunch time would benefit children and the expert felts that it was important to link primary education with nutrition.

In 1956, the Chief Minister of Madras, K.K. Kamraj set up a ‘poor feeding’ programmed and in 1982, the Chief Minister of Tamil Nadu, M.G. Ramchandran, set up a scheme called the ‘nutritious meal programme’. In a historic order 28<sup>th</sup> November, 2001, the Supreme Court of India directed all state government to introduce cooked midday meal in primary school within 6 months.

Objectives of the programme have both health and educational objectives, there are

- To improve the nutritional status and the attentiveness of school children attending primary section (I-IV).
- To attract more children for admission to the schools and retain them so that the literacy improvement of the children could be brought about.

#### **2) The Supreme Court Direction:**

In April 2001, peoples union for Civil Liberties initiated the now famous **right to food litigation**. The **public interest litigation** has covered a large range of issues relating to right to food, but the best known intervention by the court is on midday meal. Is one of its many direction to litigation the Supreme Court directed the government to fully the implement its scheme of providing cooked meal in primary school. The landmark direction converted the midday meal into a legal implement the violation of which can be taken up in the court of law. The direction and further follow up by the Supreme Court has been a major instrument universally the scheme.

#### **3) School Health Programme:**

School Health is a important branch of community health. According to modern concept, school

health programme is an economic and powerful means of raising.

### Objectives of School Health

#### Programme:

The objectives of school health programme are as follows:

- The promotion of positive health
- The prevention of diseases
- Early diagnosis, treatment and follow up defects
- The provision of healthful environment

#### Aspects of School Health Programme:

The task of school health programme is manifold and varies according to local priorities where resource are plentiful, special school health services may be developed. The main aspects of school health programme are as follows:

- Health appraisal
- Health education
- Environment consciousness

#### **3.1) Mid-day Meal Programme:**

The mid-day meal scheme is the popular name of school meal programme in India. It involves provision of lunch free of cost of school children on all working days. The key objectives of the programme are

- Protecting children from class room hunger
- Increasing school enrolment and attendance
- Improved socialization among children belong to all casts
- Addressing malnutrition and

- Social empowerment through provision of employment to women

#### **3.2) Objectives of the Programme:**

The major objectives of the programmes are

- to attract more children for admission to the school and retain them so that the literacy improvement of the children could be brought about
- to improve the nutritional status of children attending primary school

#### **3.2.1) Beneficiaries of the Programme:**

Children between 6-11 years attending elementary or primary or schools the beneficiaries of the programme.

#### **3.2.2) Organization and Implementation of the Programme:**

- the feeding is usually carried out within the school premises. The school teacher is responsible for the preparation and distribution of food and maintain of records such as- food stock register, health cards, attendant register relevant to the programme.
- The programme is operated by the education department. Special provisions are made to meet the cost of fuel. Condiments and incidentals
- Mid-day meal programme become part of the minimum needs programme in the Vth 5 year plan. The Government of India 40% expenditure and 60% is borne by the States. The responsibility of implementing

of the programme is with the state government.

### **3.2.3) The norms & coverage of the Programme:**

The scale of the food stuff prescribed per student per meal as under

- Rice – 125 gms per student per day
- Dal – 15 gm per student per day
- Oil – 1 gm per student per day
- Salt-2 gm per student per day
- Veg. Per condiment Rs. 0.09 per student per day
- Fuel & Stationary – Rs. 1.30 per student per day
- Honorarium to cook – Rs. 200 per month
- Honorarium to helper-Rs. 100 per month

### **Mid-day Meal Programme in West**

#### **Bengal:**

#### **4.1) Number of District/Block/Schools/Children covered presently-**

- 18 districts including Kolkata
- 26,21,000 beneficiaries for districts and 2,20,000 beneficiaries for Kolkata under broad programme
- 3,45,000 beneficiaries for rural areas of districts

#### **4.2) Identification of the target group-**

- School children at the primary level

#### **4.3) Implementing Agencies: Which department Education/Welfare/Panchayat**

- School education department

#### **4.4) Community Support-**

- Involvement of the Gram Panchayat in cooking the food and distributing the same from the kitchen, individual health towards procuring fuels etc.

#### **4.5) Additional Staff for the Programme at the staff level/at the district level/block level/school level**

- At the state level and at the district level only by the way of creation of posts of supervising/ministerial and group D staff-
- No additional staff for the block/school level

#### **4.6) Problem in implementation:**

- Flows of funds indicate in the past year resulting in cut in feeding days funds are not available since 1991-1992. Additional staff at the state level and the district level for implementation of school nutrition scheme has been left without work for years together. [6]

#### **Sarva Shiksha Abhiyan**

As per 86th amendment of constitution of India to get free and compulsory education from the government school is the fundamental rights of children of 6-14 years age group. SarvaShikshaAbhiyan (SSA) is Government of India's flagship programme attempted to achieve Universalization of Elementary Education (UEE) in a time bound manner as mandated by the constitution. To address the needs of 192 children in 1.1 million habitations the central government in partnership with state government is implementing this program since 2000-2001 (SarvaShikshaAbhiyan, 2015).



The program focuses on opening new schools in the areas where there are no schools along with strengthening infrastructures and other facilities in existing schools like building additional classrooms, providing additional teachers, trainings to teachers, providing drinking water facilities etc in block as well as in district level. In this digital era, SSA focuses upon building additional skills of children with special care to girl's education and children with special needs [7]

**Rastriya Bala Swasthya Karyakram**(School Health Program) Under this program all the students from 1-10 studying in Government and Government aided and unaided schools are subjected to health check up by the PHCs<sup>5</sup> and Government hospitals doctors. It was started since 2006-07 and is being carried out throughout the nation in cooperation with the Department Health and Family Welfare. In case of detection of serious health problems children are given with special medical treatment free of cost. Under this program 108597 children of 1933 schools are covered up to Dec 31st 2014 in Karnataka [8, 9]

### **1.1. The Importance of Nutrition in human health**

The importance of good nutrition is nothing new. Back in 400 B.C., Hippocrates said, "Let food be your medicine and medicine be your food." Today, good nutrition is more important than ever. At least 4 of the 10 leading causes of death in the U.S. — heart disease, cancer, stroke and diabetes — are directly related to the way we eat; diet is

also implicated in scores of other conditions. But while the wrong diet can be deadly, eating right is among the cornerstones of health.

Of course, food alone isn't the key to a longer and healthier life. Good nutrition should be part of an overall healthy lifestyle, which also includes regular exercise, not smoking or drinking alcohol excessively, stress management and limiting exposure to environmental hazards. And no matter how well you eat, your genes play a big part in your risk for certain health problems. But don't underestimate the influence of how and what you eat. You may be genetically predisposed to diabetes, but keep your weight within a healthy range through diet and exercise and the disease may never strike you. The keys to good nutrition are balance, variety and moderation. To stay healthy, your body needs the right balance of carbohydrates, fats, and protein — the three main components of nutrition.

### **1.2. Concept of Anthropometric variables**

Anthropometry is the general tool for defining overweight and obesity with body mass index (BMI;  $\text{kg}/\text{m}^2$ ) as the most common variable, using sex and age-adjusted cut-offs for children. We rely on BMI in identifying overweight, but the accuracy of BMI in predicting overweight and obesity varies with degree of fatness, with a high accuracy in fat children, less so in thin children. Annual increases in BMI during childhood have been shown to be attributed to increases in lean mass more than increases in fat mass, but varied according to sex and age. Hence, changes in BMI percentile do not necessarily reflect changes in

adiposity in children over time, especially not in children with lower BMI values. Waist circumference (WC) as well as waist to height ratio (WHR), have been shown to correlate with amount of abdominal fat, as well as cardiovascular and metabolic risk factors (Blucher et al., 2013; Grober-Gratz et al., 2013). Skinfolds in various combinations have proven to correlate with adverse health risk, as well as being able to predict % body fat better than BMI (Brambilla et al., 2013; Nooyens et al., 2007). During childhood and adolescence, the ratio between the upper and the lower body segment changes considerably, and especially during adolescence growth of the lower segment tends to precede the growth of the upper segment by several months.

In spite of available BMI definitions, a major concern regarding the overweight epidemic among children is the inability of parents, as well as healthcare workers, to recognize that a child is overweight. Several studies have demonstrated that parents in general underestimate their child's weight, and that the age and sex of the child affect their judgments. This is especially evident among the youngest children (He and Evans, 2007; Juliusson et al., 2010b). The same applies to healthcare workers (Isma et al., 2012; Turner et al., 2009). This is serious, as obesity tracking throughout childhood represents a consistent predictor of adult metabolic risk (Janssen et al., 2005).

#### **Relation between anthropometry and nutritional status**

The relative merits of anthropometric measurements commonly used in nutrition

surveys and the interrelationship between the various measurements were assessed using data obtained on 3,100 preschool children surveyed in some rural areas in and around Hyderabad City. Children of each age (1 to 5 years) and sex were classified into three groups: normal, without any nutritional deficiency signs; PCM, children suffering from protein-calorie malnutrition; and children showing signs of vitamin deficiencies.

The relative importance of various anthropometric measurements was assessed in these three groups of children through comparison of their median values and correlation coefficients between anthropometric measurements. A close relationship was observed between severities of protein-calorie malnutrition on the one hand and weight, weight-height, and calf circumference on the other. The measurements of children with signs of vitamin deficiencies and of normal were similar. Sex and age did not seem to modify the relationship between the different anthropometric measurements. The indices, weight-height<sup>2</sup> and weight-head circumference, based on the linear relationship between weight, height, and head circumference, were found to be independent of age and sex in normal children. Of these two, weight-height<sup>2</sup> was significantly lower in children with PCM but not in children with signs of vitamin deficiencies. The ratio showed a close association with other measurements, which are accepted as reflecting protein-calorie nutritional status.

The suitability of this index for detection of early cases of protein-calorie malnutrition in field

studies, where determination of age is not always possible, is discussed.

### **Why anthropometry is important to study of nutritional status**

Anthropometry (the use of body measurements to assess nutritional status) is a practical and immediately applicable technique for assessing children's development patterns during the first years of life. An evaluation of their growth also provides useful insights into the nutrition and health situation of entire population groups. Anthropometric indicators are less accurate than clinical and biochemical techniques when it comes to assessing individual nutritional status. In many field situations where resources are severely limited, however, anthropometry can be used as a screening device to identify individuals at risk of under-nutrition, followed by a more elaborate investigation using other techniques. Similarly, growth monitoring permits the detection of individuals with faltering growth, who can then be appropriately referred to specialized care. Thanks to the standardization that has taken place in recent years, changes in trends over time with respect to the nutritional situation can be evaluated in countries where national food and nutrition surveillance systems have been developed, or where nationally representative cross-sectional surveys have been conducted some years apart using identical, or nearly identical, methodologies. Although data that can be used to evaluate trends are limited, some insight can be gained into the nutritional situation and changes occurring over time in a number of countries.

### **Earlier study done by some eminent scholar**

Literature review is the root of any scientific research and review. The literature have own confidence to support any empirical study which has some descriptive and or statistical aspect. The literature review has been search through internet, pub med, J. store, journals, magazines and books.

Anational level study has been done by Christie et.all to know the impact of Mid-day-meal programme in Karnataka, India. This study has been published in an international journal of current research and academic review. The study revealed that the introduction of MDM there was a reduction in the proportion of children withstunting as well as a reduction in the proportion of children with both grades 3 and 4 under nutrition. Secondly, under nutrition among girls was high both before and after the introduction of MDM. And thirdly, the improvement in the nutritional status after the introduction of MDM was more among girls when compared to boys in a majority of the age groups. [5]

The national level study has been done by NidheeSachan and Rashmi Singh on impact of mid-day meal scheme among the children in relation with nutritional status at Kanpur district in UP. The study revealed that Results of the study indicated that the nutritional status of MDM children. The reason for poor result for schools providing Mid Day Meals could be irregular attendance of children in school, less amount of Mid Day Meal, poor of food items in Mid Day Meals, combined teaching of different standard, lack of class room etc. All these parameters need to be further studied and evaluated for these

impacts on academic achievement. Results of the study indicated that the nutritional status of MDM children. The reason for poor result for schools providing Mid Day Meals could be irregular attendance of children in school, less amount of Mid Day Meal, poor quality of food items in Mid Day Meals, combined teaching of different standard, lack of class room etc. All these parameters need to be further studied and evaluated for these impacts on academic achievement. The conclusion of the study shows a compare in relation with ICMR of the impact of mid-day meal programme. [6]

A National level study has been done by Bhawna **Mehta et. all** on Nutritional Contribution of Mid Day Meal to Dietary Intake of School Children in Ludhiana District of Punjab **to know the impact of MDMS in rural and urban school. The study revealed that** the diet of school going children was deficient in all the food groups ultimately resulted in the low intake of all the nutrients. Mid-day meal programme has been found to be a substitute rather than a supplement for the home meal. It provides nearly one-fourth of energy and fat and half of protein towards daily nutrient intake of children but only meets the one-fifth of energy and one-third of protein towards the recommended dietary allowances. The contribution of micronutrients through mid day meal programme was negligible; it varies from one-fifth to one-fourth. [7]

A field based study done by Delhi Municipal Corporation in the several schools in New Delhi region but the study revealed that

- Municipal Corporation of Delhi CD must continue to put MDM Programme on top of their agenda.
- Stockholder's collaboration is a must.
- Simple monitoring and evaluation system required.
- Good management practices, forward planning and adequate flow of finances are essential.
- Educability must go hand in hand with education.
- Field Experience and capacity building from top down is most important.
- The state must take care of the health / nutrition of ~ 90% children in the classroom who are in need of additional support.

*Some recommendation has been given for better implementation of the MDMP in Delhi.*

The following were the recommendations:

- Onsite training to include all food handlers.
- Reinforcement of training.
- Periodic monitoring to check adherence to standards.
- Maintenance of standards in unit as measure of efficiency.
- Strategy plan for better transportation of food.
- Orientation and better participation of Teachers in MDMP.
- Better facilities to be provided in school for distribution.

- Incentives for well maintained units. [10]

Effect of mid-day meal on nutritional status of adolescents: A cross-sectional study from Gujarat, a national level study has been done by Purna P Patel et. al, the study revealed that the Healthy comparison group in the study showed better nutritional status than MDM receiving adolescents. Although MDM program restricted the percentage of stunting to some extent among MDM receiving adolescents, the percentage of wasting was critical in terms of public health significance. MDM receiving adolescents were still vulnerable to energy, protein, and micronutrient deficiencies. Our study shows that though the MDM program acts as a supplement, however, it is not the sole source of RDA. Thus, there is an urgent need to reassess the MDM program, in light of findings of the present and similar studies. [11]

An international study has been done by some eminent scholar in reputed international journal on impact of Mid-Day-Meals programme on enrolment and retention of primary school children at Bolpur-Sriniketan block, Birbhum District. The study revealed that after the introduction of mid-day meals the percentage of enrolment has been increased. Parents are more interested to send their children. Due to the introduction Mid-Day meals percentage of retention has been increased. The headman has expressed their opinion in support of introducing of Mid-Day Meals scheme at the primary level. The Mid-Day Meals programme helps increasing

the attendance and enrolment of the poor students. The rural teachers and headman have unanimously positive attitude towards this Mid-Day Meals scheme. It is found that rural head teachers have showed favourable attitude towards introduction of Mid-Day Meals programme. [12]

A research scholar of Panjab University studied on mid-day meal scheme and primary education regarding the quality. The study revealed that the clients of government primary schools were the children who belonged to the poor families. Though, the objectives and potential benefits of the MDM scheme were mainly: increased enrolment, attendance and retention; improved child nutrition; and social equity. Though, the enrolment statistics have improved and the dropouts might have reduced however, quality in education and food has also decreased. Since, proper care is not being taken care while preparing the food and teachers are involved in various other duties. The quality has to be taken care in primary education in terms of class size, child-centred teaching process, and continuous assessment of learning of students and so on. After conclusion the author also has given some recommendation for the betterment of the supplement nutrition programme. We quote the author recommendation 'The recommended solution for these primary schools is to change the role of government sector in these programs. The preparation of food for the students should be contracted out to the non-government organizations. The negligence should result to the cancellation of the contracts. Further, the government's role should be more of monitoring and regulating these organizations. In

addition, midday meal scheme should be made available with the parent's representatives and teachers in the schools. This will help the teachers to bring back to their main work of teaching.' [13]

An evaluation study has been done by council for Social development sponsored by Meghalaya Government on mid-day meal programme in Meghalaya. The study revealed that the present evaluation study has tried to focus on the given assignment of evaluating the actual performance of the MDMS. It aimed to understand its process of implementation and its impact on beneficiaries in Meghalaya within a short span of 4 - 6 months. Although we were able to fathom the magnitudes of financial and administrative process and benefits perceived by the stakeholders at the local level, there are many aspects that remained untouched in current evaluation study. The scope of this study could be expanded to ascertain administrative and financial efficiencies (or the lack of it) and other aspects, more particularly the nutritional aspect, in much more detail. A separate and contextual study may be conducted to understand these aspects. In fact, a much larger study at the state level could be conducted that not only includes aspects not covered in this study , but also widens the sample size of schools, and stakeholders to get a much broader and representative picture of Meghalaya's MDM scheme on various dimensions. [14]

A research work has been published in collage Undergraduate Research electronic Journal at University of Pennsylvania. The research concludes that the purpose of this thesis is to explain how school meal programs can empower

children under the premise of rights-based empowerment. In such a setting, children, teachers, and staff become more aware that children are the rights-holders with a legal entitlement to a right to food. A rights-based approach requires an environment in the lunch room conducive to uplift, human rights education, and an institutional way for students to voice their opinions. In Kent's advocacy for a rights-based approach to the MDM, he emphasizes that an institutional means should be set in place to ensure that children have a constant way of speaking out and providing their suggestions. Moreover, children should comprise the majority of participants in a School Meal Monitoring program [15].

A state level report of state council for educational research & training centre, Chhattisgarh on Study of Impact of Mid-Day Meal (MDM) Programme on School Enrolment & Retention has been pointed out some problem and prospect. The conclusion of the report is 'During interaction with DEO and BEO it was reported that under MDM programme, the Government is providing Rs. 3.92/student/meal to Primary School students while for Middle School students Rs.5.05/student/meal are provided. Apart from the money, rice is provided through Public Distribution System and honorarium to cook-cum-helper @ Rs. 1000/- per month is also paid. The per student allocation and honorarium was confirmed by the school level authority (teachers, principals and SDMC members) as well as by the Women Self Help Groups engaged in cooking and serving the food. The Women Self Help Groups

also confirmed that they are responsible for procuring of food items and provide cooked food to school students on regular basis as per the decided menu. The menu of MDM is decided in consultation with government authority by members of School Management Committee. The rice demand is generally assessed by the WSHGs and then indicated to the school Principal. The Principal then submits the demand to the BEO. The BEO places the online demand to DEO for approval. Once the demand is approved, the concerned WSHG collects the rice from PDS shop. However, Women Self Help Groups did complain about delay in release of funds and also in adequate release of funds. Due to fund issues WSHGs are unable to earn profit, but they are continuing because the program is benefiting their own children.[16]

### Objectives of the study

Aims and objectives is an important part of any scientific study. The researchers conclude his research through this root or way. Primary School Children who are in the phase rapid growth and development are suffering from malnutrition specially protein energy deficiency disorder. Government is trying to provide them supplementary food as mid-day meal, so that they can combat with the malnutrition. So the objectives are focus on gathering the practical knowledge on the following points

- To study the health and nutritional status of primary school children

- Nutrition education by providing a free meal in the school to serve supplementary nutrition.
- To know the programme fulfils of the major objectives taken by the government to implementation the programme and how the mid-day meal objective are enhancing
- To study the nutritional status between tribal and non-tribal school going children.
- To study the problem faced by the student and government school for implanting of the programme.

### Findings of the study

This study had a total of 44 school going students who participated in the present study, among them 44 tribal and 44 non-tribal children. The age & sex wise descriptive statistics anthropometric and in derived variables among the school going children. The present study revealed a high frequency of overweight among children. From the table 1 it has been noted that the mean age is 7.24 years among the tribal and 7.28 years among the non-tribal between two districts.

**Table 1: Mean  $\pm$  SE value of age (year) among tribal and non-tribal children**

Parameter	Tribal children mean age $\pm$ SE	Non-tribal children mean age $\pm$ SE
Age (year)	7.24 $\pm$ 0.23	7.28 $\pm$ 0.24

**Table 2: Statistical Analysis of anthropometric parameter between Tribal and non-tribal school going children.**

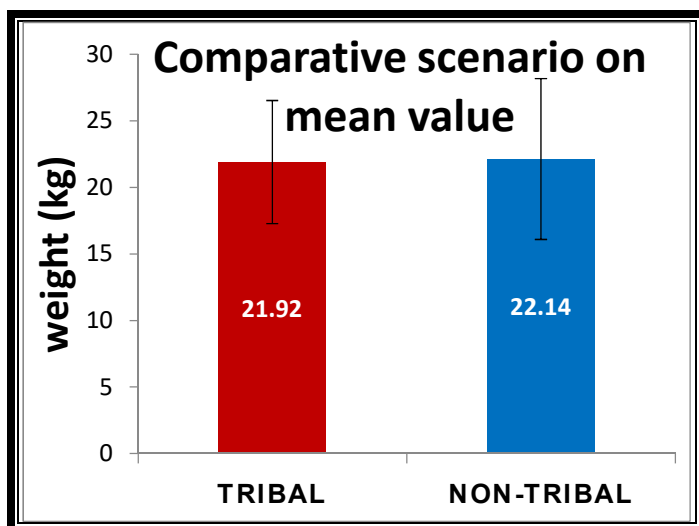


Fig.:1 Graphical representation of mean weight (kg) difference between tribal and non-tribal in school going children

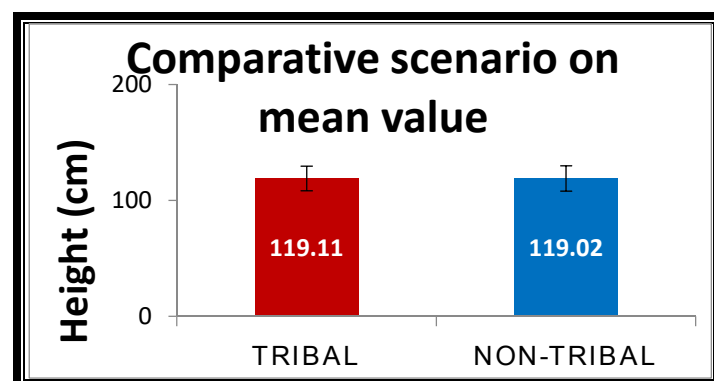


Fig.:2 Graphical representation of mean Height (cm) difference between tribal and non-tribal in school going children

Anthropometric Parameter	Tribal School going children			Non-tribal School going children			't' value
	(n=44)			(n=44)			
	Mean	SD	SE	Mean	SD	SE	
Weight (kg)	21.92	4.62	0.7	22.14	6.04	0.915	0.15
Height (cm)	119.11	10.71	1.62	119.02	10.86	1.63	0.49
BMI (kg/m <sup>2</sup> )	15.16	1.42	0.219	15.77	1.88	0.284	0.04
MUAC (cm)	21.19	4.01	0.6	27.06	2.45	0.368	0.08
Waist circumference	61.13	1.64	0.25	61.94	7.16	1.075	0.15
Hip circumference	81.89	1.17	0.27	81.55	7.13	1.075	0.25
WHR	0.85	0.0078	0.001	0.906	0.002	0.0003	0.36

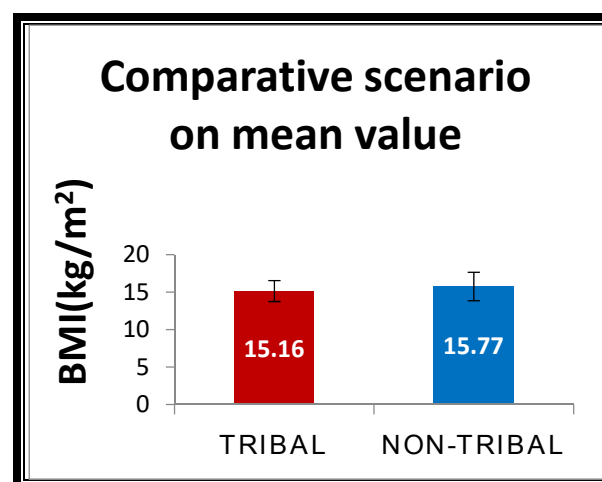
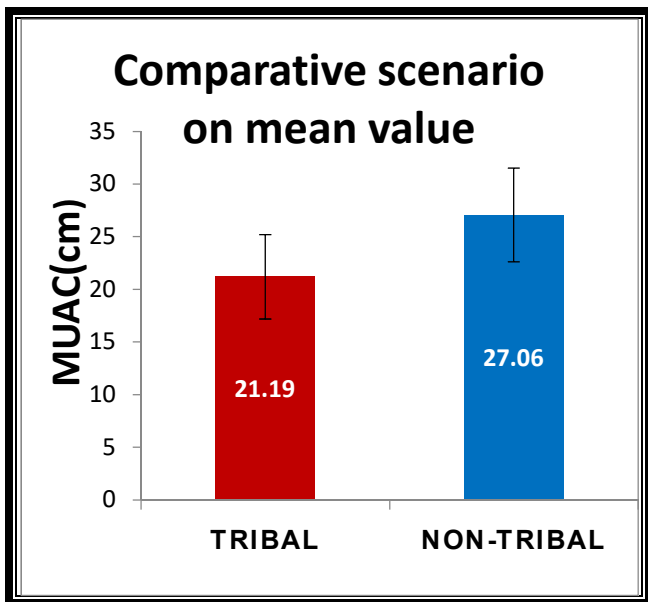
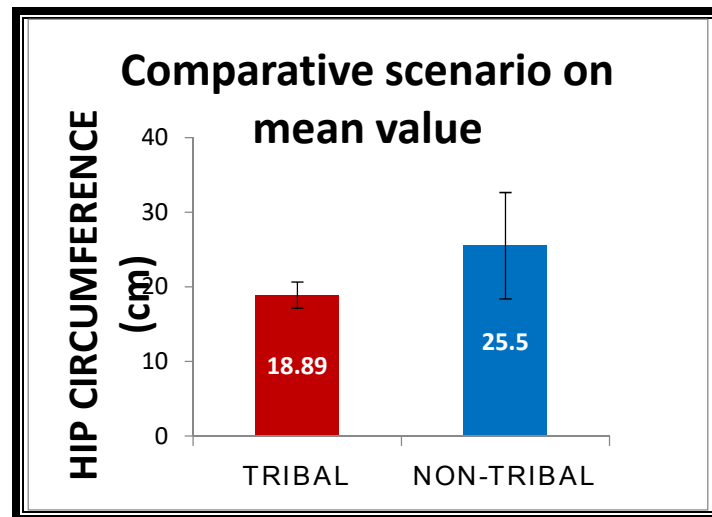


Fig.:3 Graphical representation of mean Body Mass Index (BMI) (kg/m<sup>2</sup>) difference between tribal and non-tribal in school going children

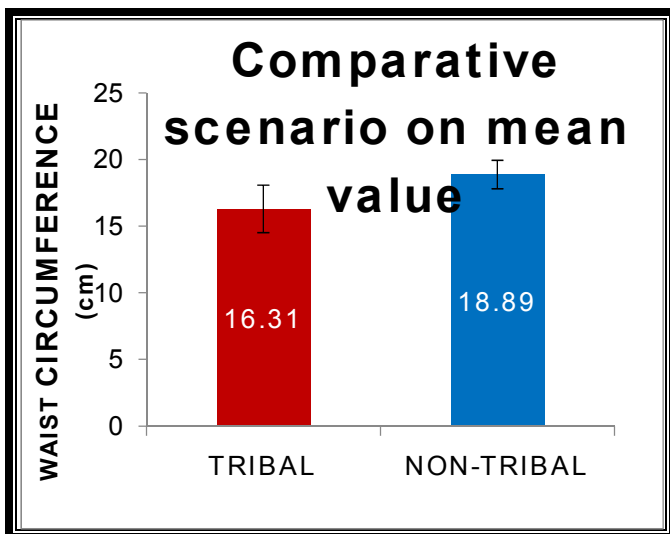




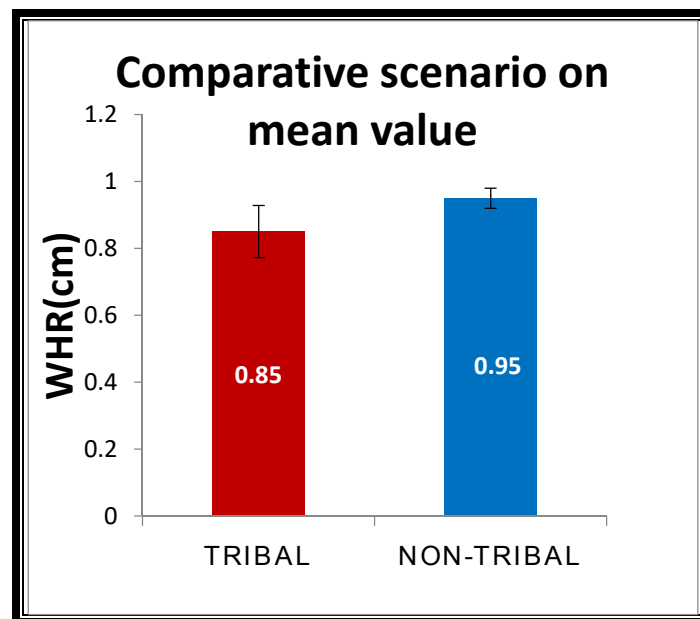
**Fig.:4** Graphical representation of difference mean Mid Upper Arm Circumference (MUAC) (cm) between tribal and non-tribal school going children.



**Fig.:6** Graphical representation of mean Hip circumference (cm) between tribal and non-tribal in school going children

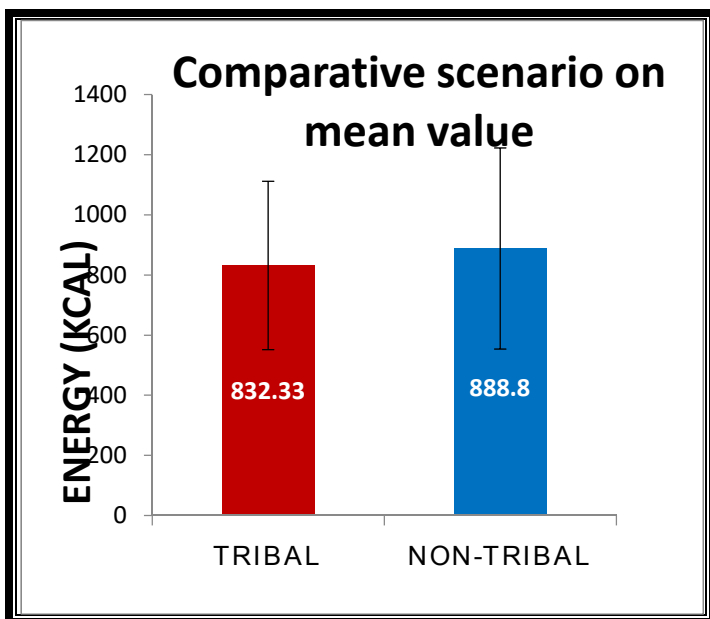


**Fig.:5** Graphical representation of mean waist circumference (cm) difference between tribal and non-tribal in school going children



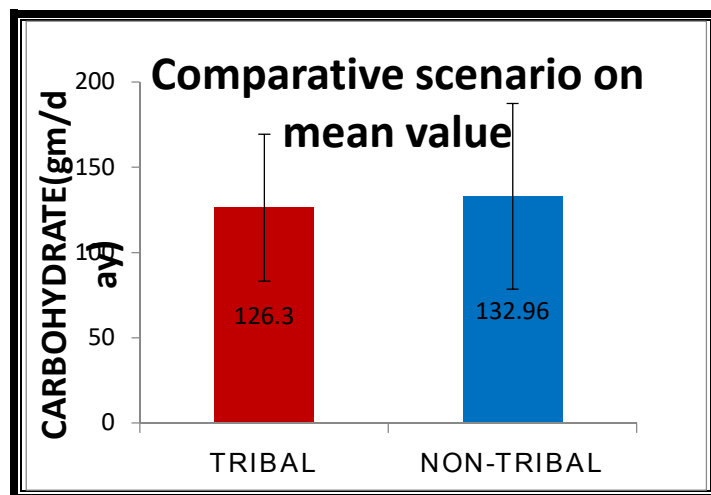
**Fig.:7** Graphical representation of mean Waist Hip Ratio (cm) between tribal and non-tribal in school going children

**Table.2.** Comparative statistical value of Average consumed nutrients among tribal & non-tribal school going children

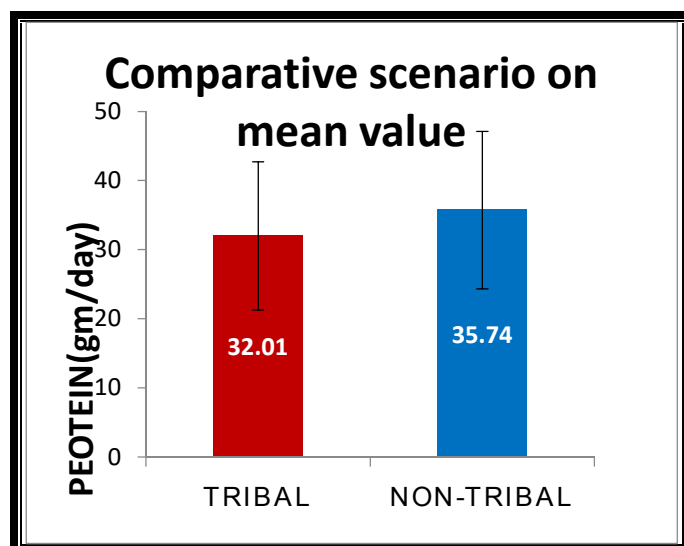


**Fig.:8** Graphical representation of mean Energy (kcal) between tribal and non-tribal in school going children

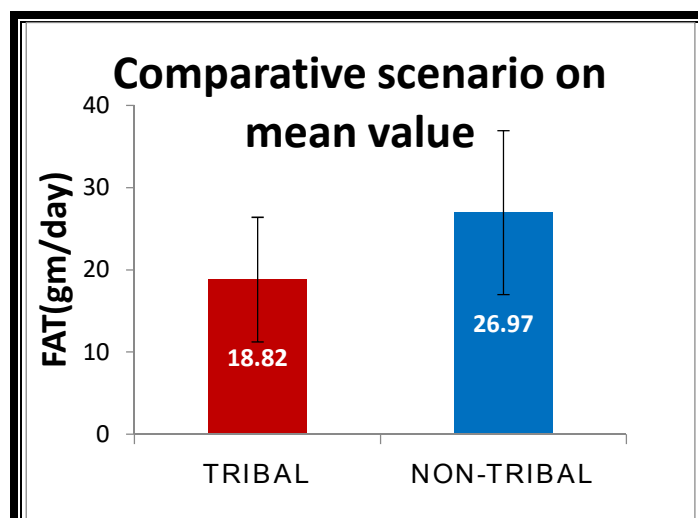
Nutrient	Tribal (n=5)			Non-tribal (n=5)			‘t’ test
	Mean	SD	SE	Mean	SD	SE	
Energy	832.33	280.20	125.65	888.8	334.18	149.85	0.47
Carbohydrate	126.30	19.34	43.14	132.96	54.44	21.41	0.43
Protein	32.01	10.73	4.81	35.74	11.41	5.11	0.41
Fat	18.82	7.58	3.39	26.97	9.98	4.47	0.39



**Fig.:9** Graphical representation of mean Carbohydrate (gm/day) between tribal and non-tribal in school going children.



**Fig.: 10** Graphical representation of mean protein (gm/day) between tribal and non-tribal in school going children



**Fig.:11 Graphical representation of mean fat between two groups.**

**Discussion of the study**

The present cross sectional study revealed that the tribal and non tribal school going children belonging to multi ethnic villages under Salboni block and Sahid Matangini block of East and West Midnapur to assess the nutritional status. The tribal and Non-tribal school going children were randomly selected, all together 88 school children (44 tribal and 44 Non tribal) of aged 5-12 years were studied. According to the constitution of India, all the children are given the right to get primary education. It is truth that still we had not get the hundred percentage success ratio but it is continuously developing. Government is implementing various initiatives and making so many efforts to enrol maximum number of students from the age group of 6 to 14. The Mid Day Meal is the world's largest school feeding programme reaching out to about 12 core children in over 12.65 lakh schools/EGS centres across the country. Mid Day Meal in schools has had a long history in India.

In all anthropometric variables shows through some graph that non-tribal school going children shows a better performance regarding weight, height, BMI, MUAC, WHR and nutrient consumption.

When we come into the specific anthropometric parameter like weight, height, MUAC, waist hip circumference, WHR have found that there is significant difference between two groups, the computed 't' value are 0.15, 0.49, 0.08, 0.15, 0.25, 0.36 respectively, But in case of BMI there is no

level of significance has been found between two groups, the computed 't' value is 0.04.

Similarly, in case of dietary intake energy, carbohydrate, protein and fat represent the significantly significant the computed 't' values are 0.47, 0.43, 0.41 & 0.39 respectively. In relation with RDA, I have found the tribal school going children and non-tribal school going consumption of nutrient are very low. Their BMI level is low than the RDA value. So, most of the studied children are belonging into the underweight category.

According to Bhawna Mehta, **The study revealed that** the diet of school going children was deficient in all the food groups ultimately resulted in the low intake of all the nutrients. Mid-day meal programme has been found to be a substitute rather than a supplement for the home meal. It provides nearly one-fourth of energy and fat and half of protein towards daily nutrient intake of children but only meets the one-fifth of energy and one-third of protein towards the recommended dietary allowances.

The specific causes of under nutrition in these children cannot be ascertained from this study. A lower socio-economic status of these children indicates that factors such as education, occupation and economic status of parents may be related to the under nutrition.

The reasons behind failure of MDMS are almost inclined upon the poor quality of food grain, ineffective management by school committee, lack of incentives to the cook cum helpers, upper castes opposition to *dalit* cooks, poor facilities in school like poor drinking water, unhygienic

toilets, delay in allocation of grain by the state government, lack of monitoring and evaluation by the responsible authority (Rama Mohan, 2014).

The present study, most of the tribal households had small size family, most of them were illiterates and they belonged to low income group. The selected children were shorter and lighter than the reference population and their food intake was also inadequate. Moreover deficiency symptoms such as brownish rough hair, anaemia, carries tooth and vitamin A deficiency disorders were seen in the selected tribal children. Majority of the tribal children showed poor growth pattern and they were not at all in good nutritional status.

Globally view that the public health hazards associated with under-nutrition and micronutrient deficiencies remain major public health problems. Therefore comprehensive health care of this section will fulfils the health need of these vulnerable populations.

#### **Need for the research to improve the failure of MDMP**

The reasons behind failure of MDMS are almost inclined upon the poor quality of food grain, ineffective management by school committee, lack of incentives to the cook cum helpers, upper castes opposition to *dalit*cooks, poor facilities in school like poor drinking water, unhygienic toilets, delay in allocation of grain by the state government, lack of monitoring and evaluation by the responsible authority (Rama Mohan, 2014). Most of the criticisms are made against two levels i.e either to central or state government or to the schools at ground level when there arise the discussions regarding the effective

implementation of MDMs however the issues with quality of food grains, quantity of food as well as regular supply/distribution of food in school may not always lies within the school level or at policy level if seen through the broader perspectives on involvement of various actors throughout the value chain. [17]

Despite of investing huge amount of funds and resources why the government is not able to achieve its target? Why there lie various complaints over the ineffective application of MDMS in India? Why the states are not able to reach to their goal besides taking multiple measures? What is happening with food grains during transportation and distribution process, inside storage as well as at schools and in schools kitchen? Are schools and schools staffs only the responsible actors for not meeting the quality as well as quantity of meals? Is it really important to do research upon the overall value chain? These all are the common questions that evolve when viewed from the perspectives of value chain process [18].

For example mid-say meal programme in Karnataka state, In context of Karnataka it has long history with Mid-day meal scheme since 1946 when the then state government started providing cooked rice and yoghurt to school children in Bangalore. Later in 1995, there was the provision of providing 3 kg of rice/wheat per month per child who had 80 per cent or more attendance. After 2002-03, it started spreading to each nook and corner of the state following the Supreme Court order of 2001. Till now it has undoubtedly improved the enrolment and

attendance of the children along with their nutritional status by reducing the malnutrition rate throughout the state; however there are so many incidences that proves irregularity in delivery of food grains to rural schools, irregularity in serving cooked meals at schools, delay in releasing funds at time, low quantity and quality of food being served to children, lack of infrastructures in most of the schools, no regular inspections from the higher authorities and very few or no participation from community members on day to day supervision during launch time at schools (19, 20).

### **The study concludes**



Mid-day meal is the very essential supplementary food for the rural poor children in several rural schools. In India most of the family sent their children without food because during school time they did not prepare boiled rice. Most of the families went for day labour early morning, after returning from labour work at time of evening they prepared boiled rice for all family. So, now a day in tribal village's mid-day meal is very much important to prevent under nutrition and malnutrition. The motto of this programme was to achieve the physical development, protect from nutritional deprivation, achievement of school

attended, to set up parent, teacher and student relation. There is a growing concern over the child health all over the world with rapid economic growth and social change. Protein Energy Malnutrition (PEM) is the most important nutrition problem globally which is more severe in third world countries affecting children of 20-80 percent of primary school going are suffering from nutritional deprivation.

It is concluded from the study that the nutritional status of Lodha tribal children of Paschim Midnapur is very poor. Nutritional statuses of Non-tribal school going children are better than tribal but still both are not consume enough nutrients according to their requirement. Both tribal and non-tribal suffered under weight, some of them are suffering malnutrition. According to the Kupper Swami Scale 2019 the Socioeconomic Status Most of the tribal families are belonging to Upper Lower (IV) socio-economic class, whereas among the non-tribal are Lower Middle (III) socio-economic class.

It is also observed that poverty is not only the main reason of under nutrition but lack of nutritious food is also one of the big reasons of under nutrition in tribal areas. It is very important for our government to create awareness about affordable nutritious food products among tribal people. It is also important to impart knowledge to them about nutritive values of locally available food and about the kind of food and its amount which should be included in their diet. It is seen that they are used to eating large amount of rice and potato because of low prices but they can get green leafy vegetables also at cheap price.

## Recommendation for proper nutrition

As a student of Nutrition science I think a proper counselling should be given to the tribal people who are belonging in poor economic condition to overcome the unhealthy nutritious food and meal pattern. The Indian government has taken steps towards providing nutritious food to school going children through mid-day meal scheme but the improvement in nourishment is still inadequate. The problem may lie in the implementation of such schemes, where preparation and distribution of food is not monitored and guidelines are not followed strictly. Moreover, the mid-day meal excludes the kids who do not go to school. The government should come up with programs which include such secluded population as well. Therefore to reduce malnutrition and or under nutrition among both community, it is essential to educate and create awareness programs at the community levels. Health education programs are urgently required to promote healthy eating and physical activity.



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*Suchorita is a, Dr. Santanu Panda is a Research Assistant at Asiatic Society, Kolkata and Rubi Panda*