

Nutritional Status of Under-Five Children: A Comparative Assessment between Malda and Pakur Districts of West Bengal and Jharkhand

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ABSTRACT

UNICEF estimated that nearly 2.6 million children, who die due to malnutrition each year, are equivalent to one-third of all registered child deaths of the world (Alkema, 2014). All over the world, it is found that the half of the children's death having due to malnutrition and most of these found in Asia having a death rate of 41%, Africa 51% and the rest of the world at 8%, (UNICEF, 2007). In developing countries, 1 out of every 4 children (roughly 146 million) is underweight and 10.9 million children under five years die each year. About 60 percent of the children's death caused due to malnutrition and hunger-related diseases (UNICEF, 2007). In India, the percentage of child mortality is very high in EAG (Empowered Action Group States) compared to non-EAG states. In Pakur district the number of **underweight children** is more (**46.9%**) compared to Malda district (37.2%) due to high fertility, low birth spacing, low educational attainments and low family income. Families whose income is low, they can't provide enough nutritional foods to their children and as a result, growth of the child is interrupted which leads to **stunted** and **wasted growth** of the child. This situation is more vulnerable in the rural areas of Pakur. In Pakur, **Body Mass Index (BMI)** of the children is very low that means they suffered from malnutrition. Due to low level of Growth, children are often suffering from various childhood morbidities. This study is an attempt to find out the comparative nutritional status of U5 children between Malda and Pakur districts of West Bengal and Jharkhand respectively.

1. Introduction

The UNDP's prime objective is to development quality of human resource of the world. In India few states are under developed in human development. These states are generally called as Empowered Action Group or EAG states. The general characteristics of EAG states are low literacy rate, high infant and maternal mortality rate, early age at marriage, high percentage of people living in below poverty line etc. There are eight EAG states in India, namely **Bihar, Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Rajasthan, Uttaranchal and Uttar Pradesh**. On the other hand Non- EAG state are developed in term of Infant and maternal mortality health care as well as in socio economic condition. Considering all these facts there is needed to study the comparative backwardness of EAG and non-EAG states child health based on their nutritional status.

The contribution made by under-nutrition towards child mortality varies by disease, and is the highest for diarrheal diseases (73%), with much lower mortality rates associated with pneumonia, measles, and severe neonatal infections (Stevens et al, 2009). In addition, malnutrition in early childhood prevents overall physical, mental, and psychological growth of the children (Victora, Adair, Fall et al., 2008; Victora, Onis, Hallal et al., 2010). Previously, the term 'malnutrition' has been often incorrectly associated solely with under-nutrition only, whereas it now refers to both excess and deficiency in nutrition confined to a specific population (Shrimpton and Rokx, 2012). The co-existence of under-nutrition and obesity in a population has been popularly referred to as 'The Double Burden of Malnutrition'. As per the Report of **UNICEF-WHO-The World Bank Joint Child Malnutrition Estimates (2012)**, 165

million (26 %) children under 5 year (U5) of age were stunted (i.e, height-for -age- below -2SD) in the world in 2011. High prevalence of stunting among U5 Child found in Africa (36% in 2011) and Asia (27% in 2011). More than 90% of world's stunted U5 children live in Africa and Asia. Malnutrition among the under-five children's is the major underlying cause of child morbidity and child mortality in many developing countries (Upadhyaya&Bhusal, 2017).

Nutritional status is the great mirror which shows the healthcare practices and its determinants of any country (Black & et al., 2013). The nutritional status of the children can be evaluated by their growth in terms of physical, mental as well as biological characteristics and stunting, wasting, underweight is the one form of malnutrition (Silva & Silva, 2015) which is the greatest single threat to the world's public health (Brozek, 1978; WHO, 2009) that affect the growth and overall development of the under-five children's which indirectly influence the country's economy (Chase & Martin, 1970). Malnutrition remains one of the common causes of morbidity and mortality among the under-five children over the world (Blackwell & et al, 2001; UNICEF, 2005). Malnutrition and Morbidity both two are strongly associated with the way of lack of proper nutritional food for children which results lack of proper physical development as well as mental development of the children which brings to them into the state of stunted, wasted and underweight (Christiansen & et al, 1974; Coursin & Read, 1977). Malnutrition is strongly produced the high risk of morbidity and mortality of under-five children's by affecting the rate of development (Chavez & et al, 1975). In addition malnutrition includes increased risk of infection, death, and delayed cognitive development (Cravioto & et al, 1966), leading

to low adult incomes, poor economic growth and intergenerational transmission of poverty (Grantham et al, 2007) and strongly affect the physical, mental, psychological as well as overall growth and development of the children's health (Engle & et al, 1979; Brockman & Ricciuti, 1971; Victora, Adair, Fall et al., 2008; Victora, Onis, Hallale et al., 2010). Malnutrition very much prevailed among the poor, illiterate and marginalised people who are not able to find their basic requirements. Malnutrition mainly occurred due to different causes such as inadequate food intake, inadequate care for mothers and children's, inadequate health care utilization and unhealthy environmental place of residence (Saloojee, 2007; Palguran, 2013).

Being EAG state, Jharkhand suffers from various socio-demographic problems like poor socio-economic condition, high maternal and child mortality, early age at marriage, high

birth rate, low level of awareness, low birth spacing etc. These factors are responsible for malnutrition among U5 children of Pakur though the situation of child nutritional status in Malda district of West Bengal is comparatively better due to its location in a non-EAG state, attention should be given for the further improvements. The NFHS 4 data indicates the relative backwardness of Pakur and this study is an attempt to compare the U5 children nutritional status between Malda and Pakur districts and its associated determinants.

2. Materials and Methods

2.1 Selection of the Study Area:

For the study Malda district of West Bengal and Pakur district of Jharkhand have been selected based on compositing method (Socio-economic and health parameters).

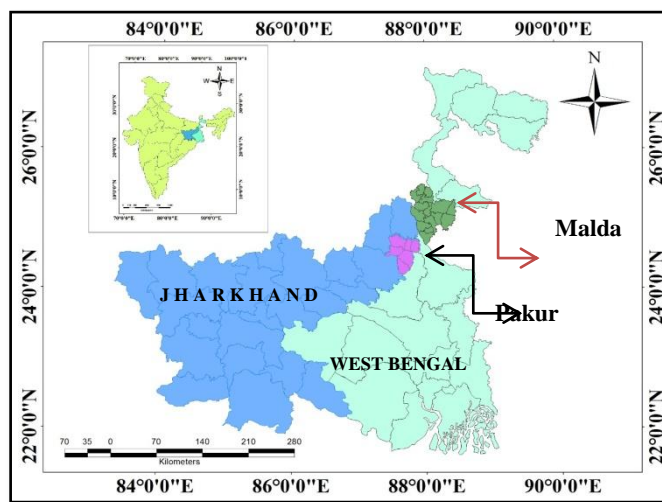


Fig. 1: Location of Pakur and Malda Districts in West Bengal and Jharkhand

2.2 Data Source and Sampling Methodology:

This study has been done based on both primary and secondary data. The primary data have been collected from rural and urban areas Malda and Pakur districts following Multi

Stage Stratified Sampling method (Fig.-2). Total 511 samples had been collected from both Malda (311 samples) and Pakur (200 samples) district.

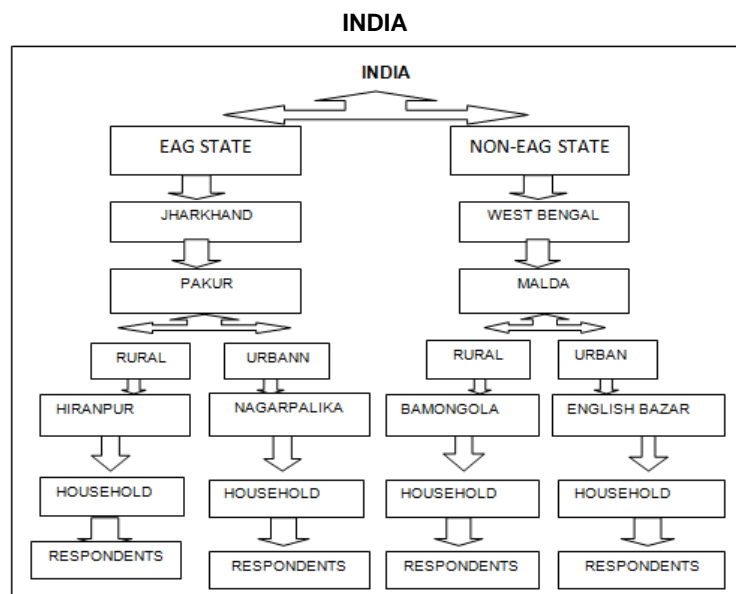


Fig.-2: Multi Stage Stratified Sampling Framework for Primary Data Collection

The secondary data relating to under 5 child nutritional status and childhood morbidity has been collected from NFHS-4 (2015-16).

2.3 Quantitative Analysis:

Body Mass Index (BMI) is a simple calculation using a person's height and weight and BMI has been used to show nutritional status of child.

$$\text{BMI} = \text{Kg}/\text{m}^2$$

Where, kg is a person's weight in kilograms and m² is their height in meters squared.

2.4 Statistical Analysis:

Linear Regression has been used to show the relationship between two variables, regression Equation is used. The formula is –

- $Y_c = a + bx$
- Where, X= Independent variable
 - Y= Dependent Variable

Composite Index has been worked out to find out developed and underdeveloped blocks of Malda and Pakur. Un-weighted composite index is used with the following technique—

$$\text{Reciprocal of Variable} = 1/\text{variable}$$

3. Result and Discussion

3.1 Comparative U5 Children Nutritional Status:

In India, the picture of nutritional status of under-five children is very worsen, only 8.7% breastfeeding children of age 6-23 months receiving an adequate diet (8.2% in rural areas and 10.1% in urban areas). On the other hand, 14.3% non-breastfeeding children of age 6-23 months receiving an adequate diet (12.7% constitute in rural and 16.9% in urban areas). And only 9.6% of total children of age 6-23 months receiving an adequate diet (NFHS-4, 2015-16). 38.4% Children under 5 years who are stunted (height-for-age), 21.0% Children under 5 years who are wasted (weight-for-height), 35.7% Children under 5 years who are underweight (weight-for-age) which shows clearly about the nutritional scenario of India (NFHS-4, 2015-16).

In West Bengal the children's nutritional status have been studied from the report of NFHS-4 which shows that the share of stunting children decreased from 45 percent to 33 percent in the last 10 years between NFHS-3 (2005-06) and NFHS-4 (2015-16), and the percentage underweight decreased from 39 percent to 32 percent while the percentage of wasting increased from 17% to 20% in the same duration. Despite the gains in stunting and underweight, child malnutrition still prevails as a strong problem in West Bengal (NFHS-4, 2015-16, West Bengal).

In Jharkhand the children's nutritional status have also been studied from the report of NFHS-4 which indicates that the percentage of stunting children decreased from 49.8 percent to 45.3 percent in the last 10 years between NFHS-3 (2005-06) and NFHS-4 (2015-16), and underweight decreased from 56.5 percent to 47.8 percent and the percentage of wasting decreased from 32.3 % to 29%. Though there are slight improvements in child nutritional status in Jharkhand, child malnutrition still prevails as a strong problem in West Bengal (NFHS-4, 2015-16, Jharkhand).

Though the maternal and child health conditions are better in Non-EAG states compared to EAG states, wide range of variations can be observed in nutritional status of U5 child in Non- EAG states. The variations in child nutritional status indicate the disparity in child health care in West Bengal and Jharkhand as well as in Malda and Pakur districts. As per the report of NFHS-4 (2015-16), 32.5% children under 5 year (U5) of age were stunted (i.e, height-for –age- below -2SD) in West Bengal whereas this percentage was 49.8 percent for Jharkhand moreover majority of U5 child were stunted in Pakur (51.8 %) while the corresponding figure was 37.8% for Malda . 24.2% U5 children of Pakur were underweight (i.e, weight-for-age below -2SD) while this figure was 22.8% for Malda. In Malda district the percentage of severely wasted and underweight U5 children were 8.9% and 37.2 % respectively and the respective figure for Pakur were 9.8% and 46.9% respectively (NFHS-4). The U5 child malnutrition is responsible for childhood morbidities like- Diarrhea, Anorexia, Fever, Serious illnesses, Infectious childhood Diseases etc. The NFHS-4 (2015-16) data shows that the prevalence of under-nutrition among under-five children of Pakur was high compared to India, West Bengal and Malda.

Table-1
Comparative Nutritional Status Childhood Diseases of Children: India, West Bengal and Malda: 2015-16

Key Indicators	India	West Bengal	Malda	Jharkhand	Pakur
Nutritional Status of Children					
Children under 5 years who are stunted (height-for-age)(%)	38.4	32.5	37.8	49.8	51.8
Children under 5 years who are wasted (weight-for-height)(%)	21	20.3	22.8	32.3	24.2
Children under 5 years who are severely wasted (weight-for-height) (%)	7.5	6.5	8.9	11.8	9.8
Children under 5 years who are underweight (weight-for-age) (%)	35.7	31.6	37.2	56.5	46.9
Childhood Diseases (children under age 5 years)					
Prevalence of diarrhoea (reported) in the last 2 weeks preceding the survey (%)	9.2	5.9	5.6	13.3	4.9
Prevalence of symptoms of Acute Respiratory Infection (ARI) in the last 2 weeks preceding the survey (%)	2.7	3.3	4.3	5.2	6.0
Children with fever or symptoms of ARI in the last 2 weeks preceding the survey taken to a health facility (%)	73.2	73.5	73.6	63.00	55.9

Source: NFHS-4(2015-16)

It is observed from the table-1 that though diarrhoea and children with fever or symptoms of ARI in the last 2 weeks preceding the survey, were more in Malda compared to Pakur, the prevalence of Acute Respiratory Infection (ARI) was much higher in Pakur than Malda.

3.2 Nutritional Status in Malda and Pakur: Comparative Assessment

3.2.1 Underweight Children

The average Indian baby weighs ranges between 2500gms (2.5kgs) to 2900gms (2.9kgs) when born at full term. As per the standard of World Health Organization (WHO), any

baby with weighs less than 2500 gms (2.5 kgs) is termed as a "low birth weight" baby, irrespective of when the baby is born during pregnancy. From the field survey it is found that around 37.5% in the rural area and 20% in the urban area of Pakur, underweight babies are found which is more than Malda district. The socio-demographic factors affecting low birth weight are low family income, early age at marriage, low level of education of mother, lack of awareness, low birth spacing and multiple births. Due to low level of education they are not aware of high fertility and underweight baby. As a result more underweight child and childhood morbidities are observed more in Pakur compared to West Bengal.

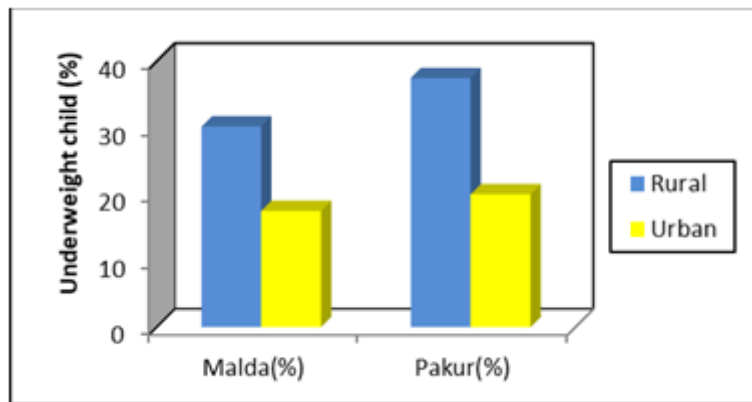


Fig.-3: Underweight U5 Children in Malda and Pakur

3.2.1.1 Underweight U5 Children by age at marriage

The study reveals that the age at marriage of females has direct negative impact on underweight children. Percentage of underweight babies are high in case of mothers with marital age <15 years in both the districts Malda (47.27%) and Pakur (34.09 %). Though in this age group percentage of underweight

baby is high in case of Malda than Pakur, in case of other age groups, percentages of underweight babies are low in Malda than Pakur. In the age group of >27 years, there is only 2.27% underweight baby are found in case of Pakur but there is no underweight baby in case of Malda (Table-2).

Table-2
Percentage of underweight U5 Children by age at marriage of females

Age at marriage of mother	% of underweight in Malda	% of underweight in Pakur
Less than 15	47.27	34.09
15-17	21.82	31.82
18-20	18.18	27.27
21-23	3.64	4.55
24-26	9.09	0.00
More than 27	0.00	2.27

Source: Field Work, 2017

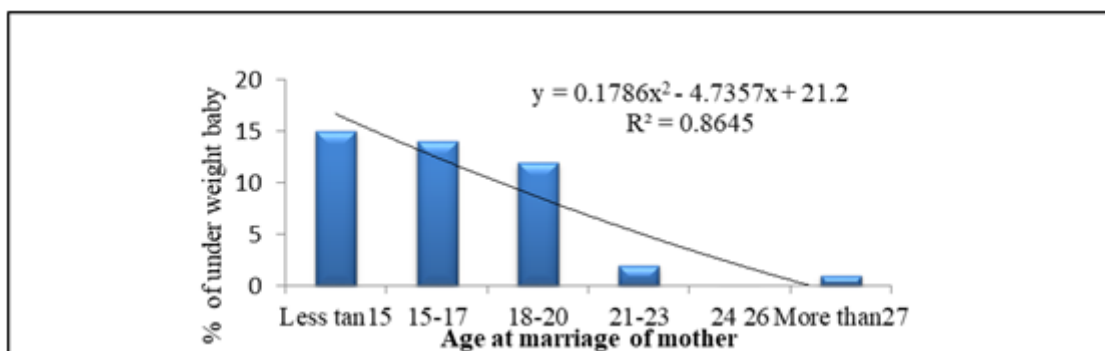


Figure 4: Relationship between marital age of mother and no of underweight baby (Pakur)

From the fig. 4, it is clear that there is negative relationship between marital age of mother and percentage of underweight children in Pakur. The percentage of underweight children is

higher where marital age is low. This trend indicates marital age of females strongly control over no. of underweight child in Pakur.

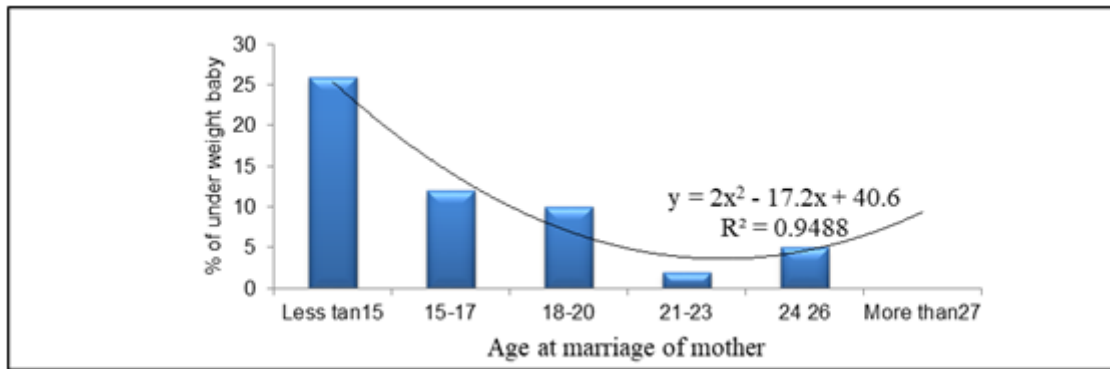


Figure 5: Relationship between marital age of mother and no. of underweight baby (Malda)

From the fig.-5 it is clear that there is also negative relationship between marital age of mother and no. of underweight baby in case of Malda. The no. of underweight babies is high where marital age is low. So, it is concluded that marital age of mother has strong negative effect on underweight babies in Malda.

3.2.1.2 Underweight U5 Children by Family Income

Strong correlation has been found between family income and underweight U5 children in both the districts. These diagram show that whose family income is less than Rs. 5000, have more underweight babies. Here R² values are 0.998 and 0.854 respectively in Pakur and Malda which indicate there is a strong negative relationship between underweight baby and family income which means increasing in family income number of underweight baby decreased. Due to low income mothers can't get enough nutritional foods and medicines, so they give birth a low weight baby. In Pakur there is more underweight child which living below 5000 family income than Malda. In Pakur most of the workers are labors. So they earn less money and due to this at the time of pregnancy they can't provide different nutritional foods and medicines.

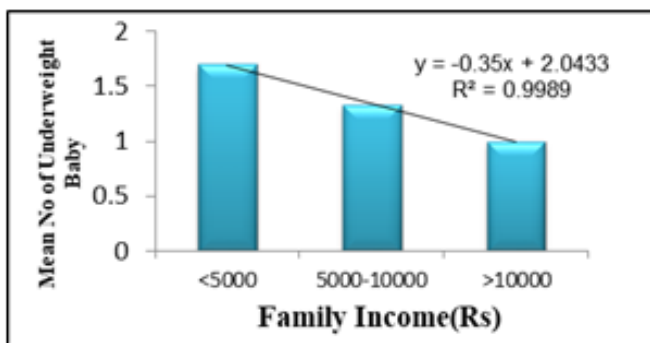


Figure-6: Relation between Mean Number of Underweight Baby and Family Income in Malda

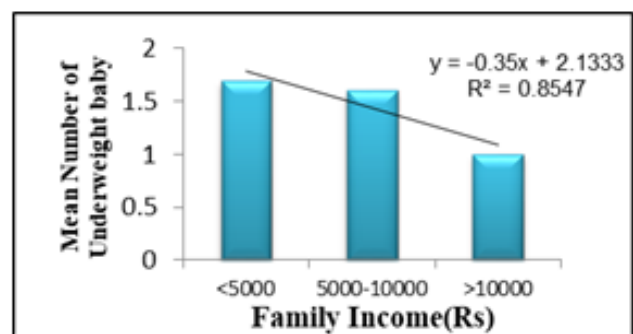


Figure-7: Relation between Mean Number of Underweight Baby and Family Income in Pakur

3.2.1.3 Underweight U5 Children by Mean Number of Child

More underweight babies are found in those families which have mean 4 child in Malda, whereas in Pakur more underweight baby are found whose family have mean 5 child. R² values indicate that there are high positive relation between number of birth and no. of underweight babies. Higher birth order results increase in underweight babies. Due to more child, mother don't get proper treatment, food and rest at the time of pregnancy and birth spacing also less and for these reasons they give birth a underweight child.

3.2.2 Stunted Child

From the field survey it has been observed that around 48.1% children in Malda have stunted growth whereas 52.8% children have stunted child growth in Pakur. More stunted child in Pakur than Malda, is the indicator of poor health condition of child in Pakur. In case of underweight children, the percentage is again high in Pakur compared to Malda. Wasted children are less compared to stunted and underweight in Malda. Percentage of wasted U5 children is more in Pakur compared to Malda.

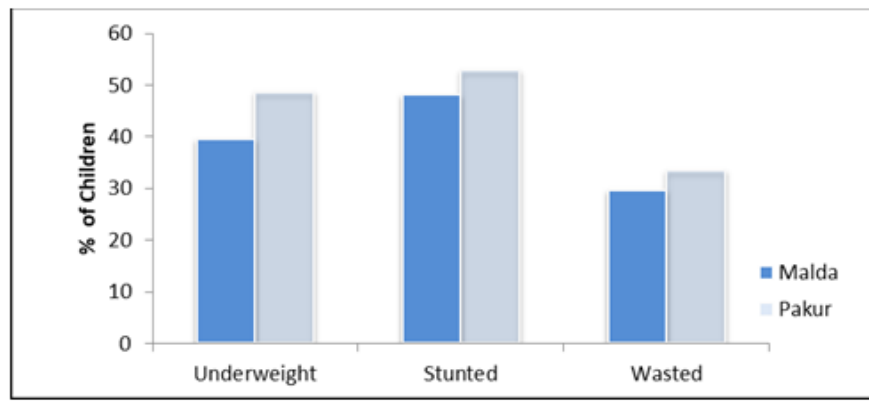


Figure-8: Comparative Nutritional Status of Children in Malda and Pakur

3.2.3 Wasted Child

From the field survey it is found that around 29.6% children in Malda have wasted growth whereas 33.4% children have stunted child growth in Pakur that means in Pakur **there is more wasted child**. Extremely low energy intake, nutrient losses, poor economic condition, low level of awareness and early age at marriage are important determinants of wasted child in these study areas. From the field survey it is found that in Malda, in the age group 4-5 years most underweight and stunted child are found, whereas most wasted child are found in the age group of 3-4 years. That means in the age group of 3-4 year, children are suffering from Malnutrition as they don't get sufficient nutritional foods. The findings of field survey also indicates that in Pakur in the age group 4-5 years most underweight and stunted child are found, whereas most wasted child are found in the age group of 3-4 years.

According to WHO, Body Mass Index (BMI) is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. BMI ranges < 18.5, 18.5 to 24.9, 25 to 29.9 and 30 or more indicate Underweight, Healthy, Overweight and Obese children (WHO). The nutritional status indicated by BMI has been shown by figure-9, and it is found that in Pakur, 84% children are found whose BMI is less than 18.5 which indicate underweight whereas in Malda, this figure is 74%. Overweight children are also more in Pakur than Malda. Due to low weight they suffer from malnutrition which affects the life of the child. Due to low family income and large family size, the children of their family don't get nutritional foods like milk, meat, eggs and also low level of literacy rate, they are not aware about children's food diet. ICDS workers performances are not good and they have to take the responsibilities to give nutritional food to the child aged 0 to 5 years in Pakur.

3.3. Body Mass Index

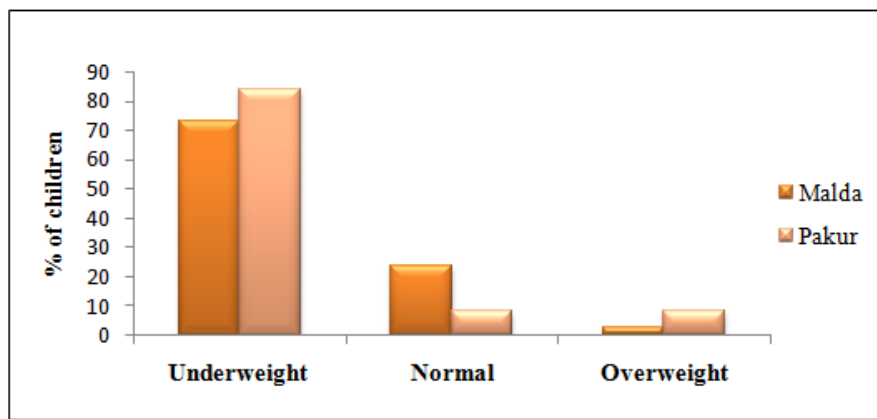


Figure 9: Nutritional Status of Child in Malda and Pakur

4. Conclusion

Malnutrition among under-five children is an imperative alarm for the public health authorities in India. The fourth Millennium Development Goal (MDG) was to reduce child mortality which was important for the bettering of child health condition i.e. also related with under-five child malnutrition and childhood morbidities. But it is very unfortunate that the Infant Mortality Rate (IMR) and under five mortality rate (U5MR) in rural India are 46/1000 and 56/1000 respectively compared to 29/1000 and 33/1000 of urban areas. The situations are better

in West Bengal (IMR 16/100 in urban areas and 32/1000 in rural areas and U5MR 16/100 in urban areas and 38/1000 in rural areas) compared to national level and Jharkhand. As per the report of WHO, despite of incredible progress in health care, more than 6 million children still die before their 5th birthday in the world every year and to reduce this the Sustainable Development Goals aim to end all forms of hunger and malnutrition by 2030 and the 2nd Sustainable Development Goal is Zero Hunger. So, improvement in U5 children nutritional status is essential to achieve the goal.

Measures must be taken to reduce the child malnutrition and child mortality in Malda and Pakur through proper planning.

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