

# Association between Parent's Social Status on Longitudinal Weight Gain of Santal Early Preschool Children of Jhargram District, West Bengal, India

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**Abstract:** ***Background:** An early childhood growth pattern is an important parameter of well-being in both developed and developing countries. Child growth is influenced by multiple biological and social cultural factors. The parent's education and occupational status are as an important role in the early stages of child growth and development. Objective: The aim of this study was to assess the impact of parent's education and occupational status on child's growth pattern. Methods: This longitudinal study was conducted in tribal areas of the Jhargram district of West Bengal, India, during 2012 to 2015. Weight of each child aged 1month to 47 months was measured and recorded by trained staff, using baby weighing scale to the nearest 0.5 kg. All information was collected by using a structured schedule through one to one interview. Child percentile growth was calculated based on recent WHO child growth standard. Weight velocity and individual average weight gain were calculated based on standard method. Results: A total of 179 Santal preschool children were included in this study. The proportion of children with weight increment under the 25<sup>th</sup> percentile was 16 % for boys and 29% for girls. In terms of parent's education, the weight increment of a higher proportion of children (above 30%) was under the 25<sup>th</sup> percentile, if the parents were illiterate, compared with about 16% when the parents were literate ( $P < 0.05$ ). Earning mothers had a significantly lower proportion of children with weight gain below the 25<sup>th</sup> percentile compared to mothers who were non-earning with father secondary employed had a lower proportion of children (22%) with weight increment under the 25<sup>th</sup> percentile than fathers primary sector employment. Conclusions: Low weight increments of tribal children are strongly associated with the parent's low education, and non-earning mothers. More well-designed studies with a larger augmentation and longer follow-up are needed to validate the present outcome.*

**Keywords:** Longitudinal growth, Santal, Education, Employment, India

## 1. Introduction

Children are the future of society and mothers are guardian of that future. So women have to play multiple roles and their time limits are so severe that their involvement in income generating activity results in reduced time devoted to their children which in turn adversely effects on child health. Hence, to ensure sound foundation and secure future of any society, health and nutrition of their children need protection. Children in the preschool stage require more attention, as this is the period of rapid growth and development, which makes them highly vulnerable to malnutrition. Malnutrition in this stage has far reaching consequences on a child's future by severely effecting child's physical and mental development (1). During preschool period child is mostly dependent on mother for all their nutritional needs. Hence it is argued that the mother being the major care provider for the child during the preschool period, her status in the family may have bearing on nutritional status of her child (2). A study conducted among Lodha children in West Bengal reported a positive association between literacy status and child underweight (3). The study also found an illiterate mother had 2.8, 2.4 and 1.7 times more chance to developed child malnutrition.

The aim of this study was to explore the association between parents' education and employment status on the longitudinal weight growth of their children less than 4 years, attending at different ICDS centers in the Jhargram district of West Bengal, India.

## 2. Material & Methods

This longitudinal study was carried out during 2012 to 2015 in 179 randomly selected Santal preschool children and their parents from ICDS center in tribal areas of Nayagram and Gopiballavpur-I blocks in the Jhargram district of West Bengal. Anthropometric measurement of weight of each child was measured and recorded by of Santal children aged one month to 47<sup>th</sup> month, by the same trained persons, using baby weighing scale to the nearest 0.5kg. Subsequently, weight was measured one month interval. The sample size varied in different ages because of non attending in monthly follow up. Child percentile growth was calculated based on recent child growth standard (4). Individual average growth increments were calculated as following equation:

$$V_{(1-47)} = \frac{(X_2 - X_1) + (X_3 - X_2) + (X_4 - X_3) + \dots + (X_{47} - X_{46})}{(T_{47} - T_1)}$$

Where, X is the attained weight at ages T, average velocity (V) of the child during one month to 47<sup>th</sup> months, can be expressed as weight gain in kilogram month<sup>-1</sup> per individual. The calculated data were plotted in bar graphs <25<sup>th</sup> percentile, 25–75<sup>th</sup> percentile and >75<sup>th</sup> percentile, respectively (5).

Ethical permission was taken from local authority and the study procedures were described to parents. Information on the parent's socioeconomic status regarding father and mother's education and employment was collected using a pretested structured questionnaire. Parents' education and

employment were defined as the main exposures of this interest for this study and characterized as follows: mother and father's education (categorized as 1. illiterate and 2. class one to XII or more education); Parents' education (1. both parents are illiterate; 2. mother illiterate, but father literate; 3. only mother literate & father illiterate and 4. both parents literate); mother's employment (categorized as 1. if the mother did not work in addition to domestic activities and 2. if the mother worked in addition to domestic activities) and father's employment, namely, primary sector and secondary sector. The primary sector consists of agriculture, forestry, fishing, mining and quarrying. Secondary sector includes manufacturing, construction and electricity, gas and water supply.

Data were analyzed using SPSS-16.0 and Microsoft Excel-2010 software. In the descriptive statistics, frequency and percentage were used for categorical variables, for example parent's education and employment. Using inferential statistics, Chi-square test was used to compare the percentile incremental growth of the children from different categories of parents' social status. A 'p' value less than 0.05 was considered as statistically significant.

### 3. Results

The majority of mothers were illiterate (58.7%) the rate was higher than that of the father (47.6%). In addition, 36.3% of parent's were illiterate and 34.1% were literate. The majority of mothers were earned and 82.1% father worked in the primary sector (table 1).

Of the 179 children, about 25% were below the 25<sup>th</sup> percentile of the average weight increment between 1<sup>st</sup> months to 47<sup>th</sup> months. There was no significant difference in both sexes in the proportion of child weight increment between the percentile groups (figure 1).

Table 2 illustrates the association between the child weight increment and parent's social status. The weight increment of the children was significantly associated with parent's education ( $P < 0.05$ ). For mother in the illiterate category about one third of the children were falling below the 25<sup>th</sup> percentile compared to 16.2% of children with literate mothers. The result showed parent's education had a significant association with child weight increment. About 35% child with weight increment below the 25<sup>th</sup> percentile were found among both illiterate parents, compared to 16.4% of children between both literate parents. Similarly, mother working status was significantly associated with child weight increments ( $P < 0.05$ ). It is important to note that the proportion of weight increment above 75<sup>th</sup> percentile was 36.1% for non-earning mothers compared to 18.6% for earning mothers. No significant association was found between the children's weight increment and their father's employment.

### 4. Discussion

This study found that there was a strong association between children's weight increment and parent's education and employment status. There was a significant association between poor educational levels and the low weight increment

and better weight increment when the parents are well educated. A possible explanation of this finding is that generally an increase in education positively correlated with an increase in income and awareness level, thus experiencing well the social status of the family.

Significant result was found that mother's employment status and their children weight increment. Being non-earner mothers were associated with a higher proportion of children in the above 75<sup>th</sup> percentile for weight increment. Similar results also reported by an earlier study conducted in Guntur, Andhra Pradesh (6). They found that mothers' unemployment provided leading to better child care and, therefore, a better growth. It is suggested that children spend more time with their mothers and under the direct supervision of their caregivers in contrast to children of employed mothers. A study found that children of employed mothers had a 10% increase in their body mass index (7). Another American study showed that mothers' employment status was significantly linked to preschool children's physical development; employment was associated with an increase in children's BMI (8). Earlier studies conducted in Ethiopia found that mothers' employment provided financial power and independence leading to better child care and, therefore, a better height and weight growth (9).

### 5. Conclusion

In conclusion, low weight increments of tribal children are strongly associated with parent's educational status. Similar prospective study with a larger augmentation is needed in all ITDA blocks of West Bengal.

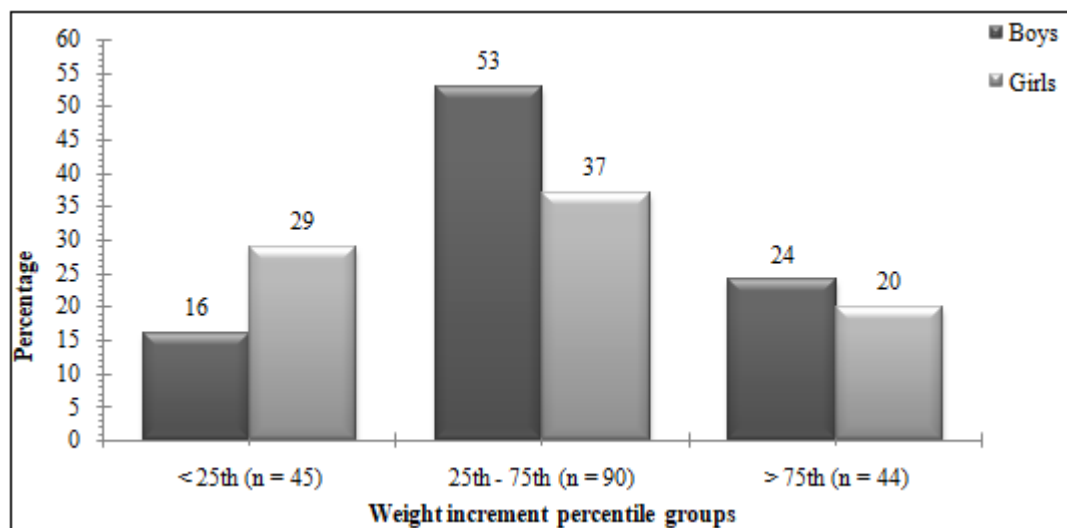
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**Table 1:** Frequencies and percentage of parent's education and employment (n = 179)

Variables	n	%
Mother's education		
Illiterate	105	58.7
Literate	74	41.3
Father's education		
Illiterate	78	43.6
Literate	101	56.4
Parent's education		
Both illiterate	65	36.3
Mother illiterate & father literate	40	22.3
Mother literate & father illiterate	13	7.3
Both literate	61	34.1
Mother's employment		
Earners	118	65.9
Non-earners	61	34.1
Father's employment		
Primary sector	147	82.1
Secondary sector	32	17.9



**Figure 1:** Average weight increment by percentile group and gender

**Table 2:** Association between parent's social status and child weight increment

Variables	Weight increment percentile						$\chi^2$
	< 25th		25th - 75th		> 75th		
Mother's education							
Illiterate	33	(31.4)	57	(54.3)	15	(14.3)	15.758***
Literate	12	(16.2)	33	(44.6)	29	(39.2)	
Father's education							
Illiterate	25	(32.1)	40	(51.3)	13	(16.7)	6.177*
Literate	20	(19.8)	50	(49.5)	31	(30.7)	
Parent's education							
Both Illiterate	23	(35.4)	33	(50.8)	9	(13.8)	17.981**
Mother illiterate and father literate	10	(25.0)	24	(60.0)	6	(15.0)	
Mother Literate and father Illiterate	2	(15.4)	7	(53.8)	4	(30.8)	
Both Literate	10	(16.4)	26	(42.6)	25	(41.0)	
Mother's employment							
Earner	29	(24.6)	67	(56.8)	22	(18.6)	7.919*
Non-earner	16	(26.2)	23	(37.7)	22	(36.1)	
Father's employment							
Primary sector	38	(25.9)	77	(52.4)	32	(21.8)	3.533
Secondary sector	7	(21.9)	13	(40.6)	12	(37.5)	

\* $P < 0.05$  \*\* $P < 0.01$  \*\*\* $P < 0.001$