



# DEVELOPMENTAL STATUS OF PRESCHOOL CHILDREN BELONGING TO LOW-INCOME FAMILIES OF RAIPUR CITY, CHHATTISGARH (INDIA)

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## ABSTRACT

**Objectives:** The main aim was to study the developmental pattern of the preschool Anganwadi children aged 2-5 years belonging to lower socio-economic class of Raipur city of Chhattisgarh on the basis of Bharat Raj's development screening test and attainment of developmental milestones. It also focussed upon the association between the mental health and the prevailing socio-economic status of the families of studied children.

**Methods:** A total of 240 children were selected from 10 Anganwadi centres of Raipur city of Chhattisgarh through purposive sampling. Information regarding socio-economic variables, milestones (standing, walking, first sentence construction, first milk tooth eruption and completion of milk teeth set) and mental development were collected using pretested structured-cum-interview.

**Results:** The studied children showed delayed attainment of motor, language and dental milestones as compared to that of Nelson's and American dental association's standards. As per the composite scores of development screening test, maximum children (59.17%) fall into normal category and among the remaining children placed in retarded category, 22.50% come under borderline category. Chi-square test showed highly significant association between mental health and the studied socio-economic variables ( $p < .01$ ).

**Conclusions:** Formal early childhood programs, focusing mainly on cognitive, social-emotional (mental health) and physical development, need to be incorporated in the curriculum of preschool centres on priority basis.

**Keywords:** Mental Development, Milestones, Preschool children, Low-income group, Chhattisgarh

## Introduction

It is widely accepted that every child follows a unique pace and pattern of development. The human brain reaches half of its mature weight by six months and 90% of its final weight by age eight. The years from the conception through birth to eight years of age are critical to the complete and healthy cognitive, emotional and physical growth of children [1]. A “child health” should be family health”, as in early or preschool years, child is an organic part of the family and whatever happens to him/ her affects the other family members or vice versa [2]. During this period, a rich environment is needed for proper growth and learning which in turn make the children emotionally secure, self-confident and proficient in language use. Many research studies have shown that preschool education is necessary for children for a better start in life which gives them a chance for higher achievement when they get older. Quality preschool education enhances the social, cognitive and language development of the children [3]. Children’s academic performance is affected by the three main areas of influence: the quality of the school, socio-economic status such as parent’s educational level and attitude towards school and child characteristics such as children’s aptitude, motivation and behavior, which in turn affect child’s health and nutrition [4]. There are many factors which detrimentally affect child development such as poverty which is further associated with poor maternal education, increased maternal stress and inadequate stimulation in the home which leads to poor school achievement of children [5].

Inadequate nutrition in the early ages of life can lead to impaired brain development and neurological and behavioral disorders such as learning disabilities and mental disorders in the later stage. Early stress can affect brain function, learning and memory and are at greater risk for developing a variety of cognitive, behavioral and emotional difficulties later in life [6].

## Methods

A cross-sectional sample of 240 preschool children aged 2-5 years was collected from 10 Anganwadi centres of Raipur city through purposive sampling. District child protection officer (DCPO) and many Anganwadi supervisors of Women and Child Welfare Department, Raipur were contacted to get the information regarding various Anganwadi centres. In order to obtain information regarding some socio-economic and demographic status of the households, parents were contacted after obtaining their respective written consent explaining the objective and methodology of the study.

**Ethical Clearance:** Ethical clearance was approved by Institutional Ethics Committee (IEC), Pt. Ravishankar Shukla University, Raipur (C.G.) for the collection of data on preschool children.

**Sample size calculation:** Minimum sample size was estimated by following equation given by Lwanga & Lemeshow (1991). The age of each subject was recorded from Anganwadi registers.

**Socio-economic Variables:** The socio-economic status of the studied families was assessed using Modified Kuppuswamy scale, updated for 2017 [7]. Socio-economic data related to family composition, educational status of parents, parental occupation, economic strategies, house type, house construction etc. were collected using structured pretested interview-cum-schedule and documentations.

**Developmental Status:** Information regarding developmental parameters of the children were collected using Developmental Screening Test (DST) by Bharat Raj which was first developed in 1977 by Dr. Bharat Raj for measuring mental development of the children from birth to 15 years of age. It is an age scale consisting of 88 items which includes motor development, language development, adaptive behaviour, personal and social development [8]. On the basis of composite scores, different grades of retardation have been categorised.

<b>Grades of Mental Retardation (Bharat Raj,1977)</b>	
<b>I.Q. Range</b>	<b>Grades of Retardation</b>
85-115	Normal Intelligence
68-84	Borderline Retardation
52-67	Mild Retardation
36-51	Moderate Retardation
20-35	Severe Retardation
Less than 20	Profound Retardation

Data on developmental milestones such as age of standing, walking, speech, first milk tooth eruption and completion of milk teeth set were taken on the basis of response of the parents.

**Analysis:** The data were analysed using Ms-Excel and SPSS software (version 16). Descriptive statistics like frequency and percentage were calculated for all variables. 95% confidence level ( $P < 0.05$ ) was considered statistically significant.

## **Results**

### **Socio-economic Status of the families of studied children**

In Kuppuswamy's scale of SES, more than 3/5<sup>th</sup> of the Anganwadi families (64.58%) were found belonging to upper lower class. Most of the Anganwadi families (64.58%) fell into monthly income range of less than Rs.10000. In terms of employment status, majority of the fathers of Anganwadi (35.74%) were found involved in self-employment. Most of the mothers, on the other hand, were found involved in unskilled work (12.66%). Majority of the fathers (30.84%) and mothers (56.24%) of Anganwadi group were found

illiterate. Most of the houses were found medium-sized having 2-3 rooms. Almost all of the Anganwadi families (98.75%) were settled in slum areas.

### Milestones related to Motor & Language Development

<b>Variables</b>	<b>Categories</b>	<b>Range (as per Nelson Std.)</b>	<b>Anganwadi N (%)</b>
Standing without support	In Time	≤9 months	120 (50.00)
	Delayed	> 9months	120 (50.00)
	Total		<b>240 (100.00)</b>
	In Time	≤12 months	100 (41.67)
Walking without support	Delayed	> 12 months	140 (58.33)
	Total		<b>240 (100.00)</b>
	In Time	≤24 months	130 (54.16)
Speech	Delayed	> 24 months	110 (45.84)
	Total		<b>240 (100.00)</b>

Nelson's standards have been used for the motor and language developmental milestones namely standing without support, walking without support and speech [9].

On comparing with Nelson's standards, half of the studied children (50%) fall in the Nelson's standard scale of standing milestone and rest of the students are found delayed in attainment.

In relation to walking milestones, only 41.67% are found to have achieved the milestone in time whereas in case of speech, more than half of the studied children (54.16%) come in the scale of Nelson's standards (Table 1).

### Dental Milestones

<b>Variables</b>	<b>Categories</b>	<b>Range* (as per American Dental Association )</b>	<b>Anganwadi N (%)</b>
Eruption of First Milk Tooth	In Time	≤6 months	93 (38.75)

	Delayed	> 6 months	147 (61.25)
	<b>Total</b>		<b>240 (100.00)</b>
Completion of Milk Teeth Set	In Time	≤ 36 months	213 (88.75)
	Delayed	> 36 months	27 (11.25)
	<b>Total</b>		<b>240 (100.00)</b>

In the present study, American Dental Association Standards have been used for two dental milestones namely eruption of first milk tooth and completion of milk teeth set [10].

The incidence of eruption of milk tooth in time is only 38.75%, however, its proportion in case of completion of milk teeth set is 88.75% (Table 2).

#### Mental Development (Development Screening Test, Bharat Raj 1977)

Grades of Retardation	Anganwadi	
	N	%
Normal Intelligence (85115)	142	59.17
Borderline Retardation (68-84)	54	22.50
Mild Retardation (52-67)	32	13.17
Moderate Retardation (36-51)	12	05.16
Severe Retardation (20-35)	12	00.00
Profound Retardation (20>)	0	00.00
<b>Total</b>	<b>240</b>	<b>100.00</b>

Developmental delay is defined as delays in speech and language development, motor development, social-emotional development and cognitive development [11].

About 3/5<sup>th</sup> of the children (59.17%) comes under normal category of mental development. Among the remaining children placed in retarded categories, 22.50% children fall into borderline retardation category. An incidence of severe and profound retardation is absent among the studied children (Table 3).

## Associations between Socio-economic Variables and Mental development

Socio-economic Variables	Mental Health		
	Chi-square value	Degree of freedom	p-value
Family size	29.913	4	.000**
Number of Children	48.912	4	.000**
Parents' Occupation	46.531	8	.000**
Parents' Education	11.512	12	.000**
Total Family Income	90.780	4	.000**

In the present study, chi-square test revealed significant association between the studied socio-economic variables such as family size, number of children, parents' occupation, parents' education and total family income and the mental development of preschool children ( $p < .05$ ). Less occurrence of normal mental health of the children may be associated with their poor socio-economic conditions (Table 3).

### Discussions

The present study attempted to assess the developmental status of the preschool Anganwadi children aged 2-5 years of Raipur city of Chhattisgarh. It focussed on developmental milestones and mental development. It also covered the associations between the mental health of the children and prevailing socio-economic conditions of the families.

In the present study, it has been found that, in the standard scale of Nelson and American Dental Association for motor & language and dental milestones, respectively, the studied Anganwadi children showed timely attainment of milestones such as standing, walking, eruption of first milk tooth whereas it is delayed in case of speech and completion of milk teeth set .

In relation to Standing and walking milestones, the findings of present study corroborate with the studies carried out on Zanzibari infants and Vietnamese children and showed delayed achievement than those of children of Nepal ,Java and Haryana [12,13,14,15,16]

The proportion of developmentally delayed children is 40.83% which is higher than under-five children of South Delhi [17], Turkey [11] & Aligarh [18] and lower than those of rural children of Ghana [19].

From chi-square test, it has been shown that the prevailing socio-economic conditions of the families significantly affect the mental health or development of the children.

## Conclusions

In general, it is accepted that ,children being brought up in unfavourable environment such as inadequate nutrition, parents' illiteracy, lack of quality interaction, large family size, poor hygienic environment, improper health care, lack of awareness about related health schemes, poor economic condition etc., show slow learning abilities, delayed achievement of milestones, poor nutritional and health status as well as limited brain functioning.

Anganwadi children of the present study, showed delayed achievement of studied developmental milestones such as speech and completion of milk teeth and earlier achievement of standing, walking and milk tooth eruption. Incidence of normal mental health is lower as compared to the children of other studies. These findings may be attributed to unfavourable socio-economic conditions of the studied families.

All four components of formal early childhood programs (social, emotional, physical and intellectual), as advocated by UNICEF, need to be incorporated in the curriculum of preschool centers for the overall development of children. Concentrated efforts to be made by all stakeholders to improve the functioning of Anganwadis.

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**Conflict of Interest:** The authors declare that they have no conflict of interest.

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