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## RESEARCH ARTICLE

### Developmental profile of children under two years in the coastal area of Kochi, Kerala

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#### Abstract

Children are the supreme asset of a nation. Numbering over 2.2 billion worldwide and 263.9 million in Indian sub-continent, children represent boundless potential. The first few years of life, especially infancy, according to UNICEF (2001) is a dynamic phase of life and is characterized by rapid growth and development. When the child does not get the right start, they never catch up or reach their full potential. So monitoring of growth and development of under – 2 children is one of the basic requisites of pediatric care. The objective of the study was to find out developmental profile of children under two years. The developmental delay was assessed using Trivandrum developmental Screening chart (Nair, 1991) and the Psychosocial development was assessed using ICMR Screening Test Battery Vazir et al (1994). Sample comprises of 384 children under two years purposively selected from the coastal area of Kochi, Kerala. 3.9 percent of children showed delay using TDSC and the detailed screening test using ICMR screening test battery the delay ranged from 1.3 to 8.1 percent.

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#### Background

The significance of under - 2 years and its impression on adulthood has been well documented. The health and well being in adult life, for that matter, are influenced or programmed by factors operating during foetal period and infancy (Fewtrell et al., 2007). An unshackled childhood is the foundation of a stable adulthood, as any child's later years is determined by his/her own experiences during the childhood. Child development is therefore rightly referred as the foundation for human development. Child development encompasses the ways in which children acquire skills in a range of domains including memory, cognition, language, gross and finer motor ability, social interaction and behaviour. The learning ability, thinking process, work efficiency and productivity of an individual in his later life are greatly influenced by these domains of development in early years.

#### Methodology

A simple development screening test designed and validated by the child development centre (CDC) Trivandrum has been used for identifying developmentally delayed children (Nair et al., 1991). TDSC (Trivandrum Developmental Screening chart) is a simplified form of Bayley scale of infant development. Data on psychosocial development of children was collected using ICMR Psychosocial Development Screening Test battery (Vazir et al., 1994). This detailed screening test comprised of five major developmental areas, namely (i) gross motor, (ii) vision and fine motor, (iii) hearing, language and concept development, (iv) self help skills v) social skills. The age of attainment of skills in each of these developmental areas was compared with the average age of attainment (50th centile) of a milestone and any lag from this reference was deemed as a delayed milestone. All the 384 children in

the study were subjected to informal screening using TDSC and psychosocial development of children were collected using ICMR Psychosocial Development Screening Test battery

Data collected for the study were compiled and subjected to statistical analysis on computation of percentages and Z value.

## Results and discussion

**Table: 1 Demographic characteristics**

Particulars	Frequency n=384	Percentage
<b>Type of family</b>		
Nuclear	195	50.8
Joint	135	35.2
Extended	54	14.0
<b>Religion</b>		
Christian	219	57.0
Hindu	120	31.3
Muslim	45	11.7
<b>Number of children</b>		
One	141	36.7
Two	201	52.3
Three	34	8.9
Four and above	8	2.1
<b>Birth order</b>		
First	173	45.1
Second	186	48.4
Third	16	4.2
Fourth	9	2.3

As the table depicts 50.8 percent of families were of nuclear type. Joint family system was also followed by a sizable number (35.2%) of study population. Extended families (14.0%) were found to accommodate widows, divorcees with or without children, although small in number.

Classification based on religion revealed that majority (57.0 %), of the sample were Christians. Hindus and Muslims formed 31.3 percent and 11.7 percent respectively. The two - child norm (52.3%) was found to be very popular among the sample, followed by single child (36.7%) and 8.9 percent had 3 children and 2.1 percent four. With regard to the birth order of children, majority (48.4%) were second born, followed by first born (45.1%) The number of children were comparatively few in the birth order of third (4.2%) and fourth (2.3%).

**Table: 2. Educational status of parents**

Particulars	Father		Mother	
	Frequency	Percentage	Frequency	Percentage
Graduate	13	3.4	25	6.5
Pre degree	82	21.3	66	17.2
SSLC	136	35.4	176	45.8
High school	125	32.5	63	16.4
Primary	27	7.1	54	14.1
Illiterate	1	0.3	0	00
<b>Total</b>	<b>384</b>	<b>100</b>	<b>384</b>	<b>100</b>

As per the above table, all the parents under the purview of the study were literate except one person. Most of them had education up to SSLC, which included 35.4 percent fathers and 45.8 percent of mothers. 100 percent literacy was noticed among mothers; with the educational qualification ranging from primary school to graduation. In fact among the parents there were more graduate women (6.5%) than men (3.4%). Paternal education along with maternal education is a strong predictor of child growth as reported by Semba et al. (2008).

**Table:3 Developmental performance of under-2 children (TDSC)**

Gender	TDSC* classification	Age in months											
		0-3		3-6		7-12		13-18		19-24		Total	
		No	%	No	%	No	%	No	%	No	%	No	%
Boys	Normal	15	100	10	100	44	97.8	57	98.3	49	94.2	175	97.2
	Delay	-	-	-	-	1	2.2	1	1.7	3	5.8	5	2.8
	<b>Total</b>	<b>15</b>	<b>100</b>	<b>10</b>	<b>100</b>	<b>45</b>	<b>100</b>	<b>58</b>	<b>100</b>	<b>52</b>	<b>100</b>	<b>180</b>	<b>100</b>
Girls	Normal	15	100	20	95.2	58	90.6	52	98.1	49	97.1	194	95.1
	Delay	-	-	1	4.8	6	9.4	1	1.9	2	3.9	10	4.9
	<b>Total</b>	<b>15</b>	<b>100</b>	<b>21</b>	<b>100</b>	<b>64</b>	<b>100</b>	<b>53</b>	<b>100</b>	<b>51</b>	<b>100</b>	<b>204</b>	<b>100</b>
Total	Normal	30	100	30	96.8	102	93.6	109	98.2	98	95.1	369	96.1
	Delay	-	-	1	3.2	7	6.4	2	1.8	5	4.9	15	3.9
	<b>Total</b>	<b>30</b>	<b>100</b>	<b>31</b>	<b>100</b>	<b>109</b>	<b>100</b>	<b>111</b>	<b>100</b>	<b>103</b>	<b>100</b>	<b>384</b>	<b>100</b>

\*Ref: Nair (1991)

As per the assessment protocol any child showing a developmental delay in any one of the 17 items studied in the TDSC instrument, is considered as a child with developmental delay. Accordingly, the sample was classified as “normal” and “delay in development”.

The results revealed that 96.1 percent of the sample had normal development. The delay in development was observed among 3.9 percent. Age wise analysis indicated absence of developmental delay up to three months for girls and up to six months for boys. The delay was the maximum (6.4%) at one year among under-2 children studied.

Gender was also found to have a clear cut influence on the developmental pattern of the children. More girl children (4.9%) exhibited developmental delay than boys (2.8%). Moreover, the delay among girls was at its peak (9.4%) at one year of age, whereas boys (5.8%) showed a maximum delay in development at 2 years.

Age and gender-wise classification, further revealed that developmental delay among boys occurred at around one year (2.2%) and incidence rate has increased to the peak (5.8%) at two years of age. For girls developmental delay started occurring at an earlier stage (6 months) than boys (one year). The incident rate was 4.8 percent (1 out of 21) at six months, 9.4 percent at one year, 1.9 percent at 18 months and 3.9 percent at two years. Though the incident rate of developmental delay among girls (9.4%) was much higher than that of boys (2.2%) at the age of one year: the girls were able to catch up with the developmental target to some extent as they attain the age of 18 months (1.9%) and at two years the delay was comparatively less (3.9%) than the boys (5.8%) of same age. So it was observed that there was a decline in the developmental delay among girls (3.9%) at two years; but boys (5.8%) failed to do so.

The present results are agreeable with the observations by Nair and Pejaver (2000) at Kudapanakunnu and Vattiyoorkavu Panchayat, Trivandrum District, where the prevalence rate of developmental delay was 3.9 percent. The prevalence of developmental delay reported by various authors in different studies conducted in Kerala ranged from 3.5 to 10 percent (Rydz et al., 2005; Nair and Radhakrishnan, 2004; Louise et al., 2002; Lewis and Judith, 1994).

Whereas using the same instrument, TDSC, Meenai and Longia (2009) in Bhopal identified 19 children out of 200 (9.5%) to have developmental delay of which seven children (36.84%) were less than 6 months of age, equal number of children were of age between 6 to 12 months, three children (15.78%) were between 12 months to 18 months of age and two children (10.52%) were between 18 to 24 months.

**Table: 4. Psychosocial development of under -2 children**

Dimensions	Screening test+	Boy		Girl		Total		Z-Value
		No	%	No	%	No	%	
Gross motor	Normal	170	94.4	197	96.6	367	95.6	0.997 <sup>ns</sup>
	Delay	10	5.6	7	3.4	17	4.4	
Vision and fine motor	Normal	172	95.6	190	93.1	362	94.3	1.032 <sup>ns</sup>
	Delay	8	4.4	14	6.9	22	5.7	
Hearing, Language and concept development	Normal	168	93.3	201	98.5	369	96.1	2.545*
	Delay	12	6.7	3	1.5	15	3.9	
Self help skills	Normal	176	97.8	203	99.5	379	98.7	1.440 <sup>ns</sup>
	Delay	4	2.2	1	0.5	5	1.3	
Social skills	Normal	162	90.0	191	93.6	353	91.9	1.289 <sup>ns</sup>
	Delay	18	10.0	13	6.4	31	8.1	
		180	100	204	100	384	100	

+Ref: ICMR screening Test 1994

\* significant at 5 percent level

The table above depicts the extent of delay in each domain studied and the gender differences in development. The delay in general ranged between 1.3 to 8.1 percent; with the least delay in self-help skills and highest in social skills.

A clear-cut gender variation was also recorded in the percentage delay in psychosocial development, with boys (delay ranged from 2.2 to 10 %) being more affected than girls (delay ranged from 0.5 to 6.9 %).

Yet another unique feature noticed was irrespective of gender, the domain “self-help skills” recorded the maximum attainment in psychosocial development and so the least was the delay in this respect. Similarly, the lagging in the attainment of “social skills” by the under-2 children was also uniformly higher in both the genders. Therefore, the t test computed to find out the gender influence on the psychosocial development delay, failed to show any significant difference with gender, in most of the domains studied, except one, i.e. “hearing, language and concept development.” In this domain the percentage delay among girls (1.5%) was significantly ( $P < 0.05$ ) less than that of boys (6.7%). Malik et al. (2007) in their study on screening psychosocial development among under-2 children in Delhi revealed that, infants who achieved milestones in time were 92.5 percent for social skills, 91.8 percent for hearing, language and concept development and 90.6 for gross motor milestones. And the percentages were lower for vision and fine motor (88.6%) and self-help skills (81.4%). However, in the present study the highest percentage of infants (98.7%) has achieved the milestones of self-help skills in time. Further in the present study, the percentage score secured by the under-2 children in all the five domains were much higher than the reported values for the respective domains by Malik et al. (2007) except social skills. In this domain, both values were almost comparable; such as a reported value of 92.5 percent (Malik et al., 2007) against 91.9 percent observed in the present study.

The presence and availability of mothers with infants (as most of the mothers were not employed) may be a potential factor which helped in an appreciable self-help development among infants and also the hearing language skills and concept development, especially because of continuous interaction and consistent stimulation from the mother. The same may be the cause of deficit in social skills as the mothers availability at home, limited their chances of socialization with others.

This kind of developmental assessment may be of passing interest to a normal healthy infant, but may take on special significance with respect to a suspected developmentally abnormal child. The score obtained can prove useful in detecting the precursors of later impairment.

The risk of developmental delay depends on the interaction between biological and psychosocial variables (Persha and Rao, 2003). Therefore, it is difficult to identify specific etiology (Mathew, 2002). From the review of literature it appears that intellectual disability can have multiple causes and the more the number of risk factors, the greater the chance of significant developmental delay.

The development of psychomotor functions follow progressive sequences along gross motor abilities, communication skills fine motor skills and personal social behaviour (Illingworth, 1999). Apart from sex and genetic factors, nutritional, environmental, socioeconomic and cultural factors also influence the developmental process. Variation of such influences from one community and ethnic group to another necessitates the development assessment in all such communities and groups.

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