

# Assessment of Learning and Development of Children Aged 4-5 Years Attending Anganwadi at Urban Field Practice Area -A Cross Sectional Study

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## Abstract

**Background:** Early childhood education (ECE) provides three hours a day education to the children of 3–6 years age group. If implemented properly, it helps children to improve their social competence with better adjustment in school. Aim was to assess learning & development of children aged 4 - 5 years at urban Anganwadi Centres based on child assessment card and objective was to compare learning & development across different domains of child assessment card between undernourished and adequately-nourished children aged 4 - 5 years.

**Methodology:** Cross sectional study was conducted among 70 children aged 4-5 years at urban Anganwadi Centres. Scores as per domains of Child assessment card were calculated. Height- for -age was calculated. Comparison of performance between stunted and adequately nourished children was done. Data was summarized using numbers & percentages. Chi square was used as test of significance. Among 70 children, 36 (51.43%) were male.

**Results:** For physical and motor development 16 (22.85%) had perfect score. For Sensory, perceptual and cognitive development 37 (52.86%), for language, literacy and communication 32 (45.71%), for personal-social and emotional development 10 (14.29%) and for creativity 5 (7.14%) had perfect score. Among all 70 children 30(42.8%) were found severely stunted, 21(30%) moderately stunted. Stunted children had poor performance in all five domains. Children have poorest performance in creativity domain.

**Conclusion:** Overall, learning & development of children aged 4-5 years at Anganwadi centres are poor. Stunting significantly affects domains of physical and motor development and Sensory, perceptual & cognitive development.

**Key-words:** Anganwadi Centre, learning and development, early childhood education, stunting.

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## Background

Government of India started Integrated Child Development Services (ICDS) program for children aged 0–6 years through a network of centres, known as “Anganwadi Centre” (AWC) in the year 1975.<sup>1</sup> Anganwadi literally means “courtyard shelter”. It

provides various services like nutrition education and supplementation and pre-school activities.<sup>2</sup> Among all services provided by AWC, early childhood education (ECE) which is also known as pre-school education is important part of program which provides three hours a day education to the children of 3–6 years age group. It not only provides formal learning but develops the child's desirable attitudes and behaviour patterns.<sup>3</sup> If ECE developed well in children it will help them to improve their social competence, better adjustment in school and learn the skills of literacy more effectively.<sup>4</sup>

Learning and development among children can be assessed by various tools such as Programme Evaluation Package developed by World Bank, ECE Quality Assessment Scale by Centre for ECE and Development and Child assessment card published by Ministry of Women and Child Development. Child assessment card includes five distinct but interconnected domains i.e. physical wellbeing and motor development; social and emotional development; approach to learning; language development; cognitive development; and general knowledge.<sup>5</sup>

Nutritional status of the child affects the growth and development. Stunting is a useful measure of chronic undernutrition defined as height for age less than two SD (Stunting definition, WHO )<sup>6</sup>

Very few studies have addressed overall development of the children along with comparison of learning and development among undernourished and adequately nourished children.

Hypothesis: Learning and development in all domains of child assessment card is affected in undernourished children as compared to adequately nourished children of 4 – 5 years age group at Urban Anganwadi Centre.

Aim: - To assess learning & development of children aged 4 - 5 years at urban Anganwadi Centres based on child assessment card.

Objective: To compare learning & development across different domains of child assessment card between undernourished and adequately-nourished children aged 4 - 5 years at urban Anganwadi Centers

### **Methods**

A cross sectional study was conducted amongst 70 children aged 4-5 years enrolled under anganwadi centres at urban field practice area of a tertiary care centre during October 2019 to April 2020. Actual data collection was done during February and march 2020. Approval from institutional ethics committee was sought prior to the commencement of data collection.

Field practice area of urban health care centre has five Anganwadi Centers. In all, 352 children were enrolled in these five Anganwadi Centers. Among 352 children, 73 were of age group 4-5 years.. Universal sampling was done. Three children or their reliable informant were not available even after repeated visits and were therefore excluded from the study. Thus, 70 children formed the final sample size. Date of birth record was available at Anganwadi Centres.

A predesigned proforma based on Child assessment card published by Ministry of Women and Child Development was used. Assessment of learning and development was done through direct observation of child's physical activity like throwing, catching and kicking a ball, and history from mother as well as anganwadi worker regarding participation during play time. Child assessment card has five domains viz physical and motor development, sensory, language, personal, social and emotional and creativity. Each question was given score one for yes and zero for no. Score for each domain was calculated. Height and weight were measured using standard protocol. Anthropometric index i.e. height- for- age was

calculated. Z scores between -2 & -3 were considered moderately stunted whereas z scores less than -3 SD were considered as severely stunted<sup>5</sup>. Comparison of performance across different domains between the stunted and adequately nourished children was done.

Data was entered in excel sheet and statistical analysis was done through Open epi online statistical software. Descriptive data was summarized using

numbers and percentages. Confidence Interval was calculated for proportion of children performing each activity. Chi square test was used as test of significance for categorical variables. P value less than 0.05 was considered to be statistically significant.

**Results**

Among 70 children 36 (51.43) were male.

**Table 1: Frequency of children performing activities of Physical & motor, Sensory, perceptual & cognitive development(n=70)**

Sr No.	Activity	frequency	Percentage (95% CI)
1.	Participates actively during playtime	70	100
2.	Can throw, kick & catch a big ball	70	100
3.	Can run at a fast & slow pace	70	100
4.	Can thread beads in a given sequence	16	22.86(13.02,32.70)
5.	Can join dots to form a shape/figure	21	30(19.26,40.74)
6	Can classify different objects based on odours, tastes & textures etc.	65	92.86(86.83,98.89)
7	Can classify objects on basis of two concepts (shapes & colour) e.g. classify yellow circles	43	61.43(50.03,72.83)
8	Can complete a simple pattern	42	60(48.52,71.48)
9	Can solve a maze/puzzle of 5 pieces	37	52.86(41.17,64.55)
10	Can count objects upto 5 in numbers & match these with numerals.	37	52.86(41.17,64.55)

**Table 1** shows that all the children (100%) participated actively during playtime, could throw, kick & catch a big ball and ran at a fast & slow pace; while only 16 (22.86%) children could thread beads in a given sequence. It reveals that 65(92.86%) children amongst 70 children could classify different objects based on odours, tastes & textures; whereas only 37 (52.86%) children were able to solve a maze/puzzle of five pieces & count objects upto five in numbers & match these with numerals.

**Table 2: Frequency of children performing activities of Language, literacy & communication and creativity**

Sr no.	Activity	Frequency	%(CI)
1	Listens with attention to spoken conversations & stories	37	52.86(41.17,64.55)
2	Can express feelings & ideas in simple sentences & asks questions	60	85.71(77.51,93.91)
3	Can narrate an already heard sequence using appropriate vocabulary	37	52.86(41.1764.55)
4	Enjoys exploring books & other printed material & shows interest in decoding printed words	37	52.86(41.1764.55)
5	Can recognise the first sound of a given word	70	100
6	Shows creativity in daily activities (eg experiments with objects/words in new & different ways)	37	52.86(41.17,64.55)
7	Participates in dance, drama & music activities	16	22.86(13.02,32.70)
8	Uses imagination in drawing, art work & problem solving	26	37.14(25.82,48.46)

**Table 2** provides information about activities of Language, literacy, communication and creativity. All 70 (100%) children were able to recognize the first sound of a given word; while only 37 (52.86%) children listened with attention to spoken conversations and stories, enjoyed exploring books & other printed materials.it was found that 37 (52.86%) children showed creativity in daily activities like experiments with objects/words in new & different ways whereas only 16 (22.86%) children used to participate in dance, drama & music activities.

**Table 3: Frequency of children performing activities of Personal, social & emotional development**

Sr no.	Activity	Frequency	%(CI)
1	Enjoys playing with a group of children	49	70(59.26,80)
2	Interacts comfortably with familiar individuals	70	100
3	Shares with friends/peers	49	70(59.26,80.74)
4	Waits for turn while playing or in other situations	22	31.43(20.55,42.31)
5	Can recognize & express simple emotions such as joy, sadness & anger	70	100
6	Shows curiosity & interest in learning new things	65	92.86(86.83,98.89)
7	Enjoys engaging in pretend play	47	67.14(56.14,78.14)

It is apparent from **table 3** that all 70 (100%) emotions such as joy, sadness & anger; while only children interacted comfortably with familiar 22(31.43%) children waited for their turn while individuals, recognized and expressed simple playing or in other situations.

**Table 4: Summary-Distribution of children who have performed all activities in each domain (n=70)**

Sr no.	Domain	Perfect score	
		Frequency	% (CI)
1	Physical & motor development	16	22.86 (13.02,32.70)
2	Sensory, perceptual & cognitive development	37	52.86(41.17,64.55)
3	Language, literacy & communication	32	45.71(34.04,57.38)
4	Personal social & emotional development	10	14.29(6.09,22.49)
5	Creativity	5	7.14(1.11,13.17)

**Table 4** shows that among all domains, children had best performance with respect to sensory, perceptual and cognitive development while worst performance in creativity.

Among all 70 children 30(42.8%) were found severely stunted, 21(30%) moderately stunted whereas only 19(27.2%) children were found adequately nourished as per height for age.

**Table 5: Comparison of learning and development among undernourished and adequately nourished children in various domains**

Srno.	Domain	Frequency (%) mod/Severe stunting n-40	Frequency (%) Normal height for age n-30	P value Chi square test
1	Physical & motor development	35(87.5)	19(63.3)	0.017 (S)
2	Sensory, perceptual & cognitive development	23(57.5)	10(33.3)	0.046 (S)
3	Language, literacy & communication	24(60)	14(46.7)	0.26 (NS)
4	Personal social & emotional development	35(87.5)	25(83.3)	0.6 (NS)
5	Creativity	37(92.5)	28(93.3)	0.9 (Fisher exact)

**S- Significant; NS- Not significant**

**Table 5** shows comparison of learning and development among undernourished and adequately nourished children in various domains. It was found that, among 70 children, 40 children were moderately/severely stunted whereas 30 children had normal height for age. Proportion of stunted children who had poor performance was higher in all five domains as compared to adequately nourished children and the difference was statistically significant in the domains of physical and motor development and Sensory, perceptual & cognitive development.

**Discussion**

Present cross-sectional study was conducted among 70 children aged 4-5 years enrolled under five Anganwadi centres at urban field practice area of tertiary care centre. Many studies have addressed growth of children by assessing nutritional status. Very few studies are focused on overall development of children. Pre-school education is an integral part of development. Present study assessed learning & development of children aged 4 - 5 years at urban Anganwadi centres and compared the learning and development of undernourished and adequately nourished children among these domains. Four to five years age group was selected because after this age, formal schooling of children starts.

Present study evaluated the Anganwadi children in five domains. Performance of majority of children was below expectation level in all the domains. CDC also mentions about similar domains like social and emotional, language/communication, cognitive and movement/physical development.<sup>7</sup>

Ministry of women and child development has provided guidelines at Anganwadi centres for pre-school education kit, materials to be procured and four activity corners<sup>8</sup>. These facilities were grossly lacking at the Anganwadis under study. ICDS programme

lays more emphasis on nutrition, growth monitoring & immunization of children. However, the pre-school education component is neglected to certain extent.

Gross motor activities like throwing and kicking ball were performed by all the 70 (100%) children as opposed to the finding of Shrivastav D et al<sup>9</sup> where gross motor activities were performed by only 44.44% children. Fine motor activities which require some trainings were performed by around one fifth of the children in the present study, which is similar to the finding of Shrivastav D et al<sup>9</sup> and Qadiri F et al<sup>10</sup>. In the present study, 61.43% of children could classify objects based on shape and colour. In a study by Kular SS<sup>11</sup>, only 2.5% children knew names of four different colours. In the present study, language, literacy perfect score was achieved by less than half of the children. This finding is somewhat similar to the finding of Shrivastav D et al<sup>9</sup> where 61.11% children showed language development. Very few children (7.14%) had perfect score in creativity domain. In contrast to the finding of present Study, Shrivastav D et al<sup>9</sup> shows higher proportion (27.70%) children were creative.

Proportion of stunted children who had poor performance was higher in all five domains as compared to adequately nourished children and the difference was statistically significant in the domains of physical and motor development and Sensory, perceptual & cognitive development. Study conducted by Kesari KK et al<sup>12</sup> found that undernourished children have deficit on most of the cognitive development such as attention, executive function, calculation, visuo-perceptual ability, long term learning and memory and intelligence. In 2018 Kang Y et al<sup>13</sup> conducted a study where they found that stunted children had poor child development indicators which is similar to our study. Similar to our study Wachs et al<sup>14</sup> mentioned in their study malnutrition increases the risk of developmental & cognitive delays in children. In 2020 Alam MA

et al<sup>15</sup> found in their study that stunted children had significantly lower cognitive scores compared to healthy children.

All the children enrolled in anganwadi centres of field practice area satisfying the eligibility criteria were included in the study. Sample size therefore may not be optimal. Study findings thus have limited generalizability.

Overall picture of learning & development of children at Anganwadi emerges not to be satisfactory. Among all five domains of child assessment card, domain of creativity shows poorest performance. Undernourishment affects learning and development in all the domains and is significantly affected in domains of physical and motor development and Sensory, perceptual & cognitive development.

Systematic implementation of early childhood education according to the guidelines prescribed by Ministry of women and child development should be done at each Anganwadi. Special emphasis on creativity domain should be given. Special focus on undernourished children for their learning and development along with nutritional status is required. Full integration of health and pre-primary education can achieve overall development of the children.

**Abbreviations:** Not Applicable

**Declarations:**

Ethics approval and consent to participate: Approval from institutional ethics committee of SVN Government Medical College, Yavatmal, India (vide letter no 33/2020 dated 23/01/2020) was sought. Written informed consent of mothers of participating children was taken.

**Consent for publication:** Consent was taken prior to data collection from mothers of participating children.

**Availability of data and material:** Data supporting findings of the study are available with corresponding author

**Competing Interests:** The authors declare that they have no competing interests

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## References

1. National Institute of Public Co operation & Child Development. Research on ICDS: An Overview, (1996-2008)Volume 3 New Delhi, India; 2009. [cited September 9 2021] Available from url: <https://www.nipccd.nic.in/file/reports/icdsvol3.pdf>
2. Home page. Women and child development department. [Cited 2020 September 18] Available from url: <https://womenchild.maharashtra.gov.in/content/innerpage/anganwadi-functions.php>.
3. Kaul V, Sankar D. Education for all- Mid-Decade Assessment Early Childhood Care & Education in India. New Delhi: NEUPA; 2009. [Cited may 10 2021] Available from url: <http://www.educationforallinindia.com/early-childhood-care-and-education-in-india.pdf>.
4. World Bank. ECE Program Evaluation Package. New Delhi; 2010. [Cited May 5 2021] Available from url: <http://www.datatopics.worldbank.org/hnp/files/edstats/INDwp09a.pdf>.
5. Ministry of Women and Child Development. Quality Standards for ECCE. New Delhi: Government of India; 2012. [cited 2020 September 20] Available from url: [http://www.icds-wcd.nic.in/schemes/ECCE/Quality\\_Standards\\_for\\_ECCE3%20\(7\).pdf](http://www.icds-wcd.nic.in/schemes/ECCE/Quality_Standards_for_ECCE3%20(7).pdf).
6. World Health Organization. Global database on child growth and malnutrition [cited 2020 Oct 18]. Available from url: <http://www.who.int/>

- nutgrowthdb/about/introduction/en/index2.html.
7. Learn the signs. Act Early. Centers for disease control and prevention. [cited 2020 Oct 18] Available from url:<http://www.cdc.gov/ncbddd/actearly/milestones-4yr.html>.
  8. Ministry of women and child development, Government of India New Delhi Pre school education kit. New Delhi 2017.[cited september 9 2021] Available from url: <https://wcd.nic.in/sites/default/files/Pre-School%20Education%20Kit.pdf>.
  9. Shrivastav D, Sagar B. Early childhood education under ICDS: An evaluation. *Journal of Educational Chronicle* 2012;3(2):40-3.
  10. Qadiri F, Manhas S. Nature of pre-school education imparted at anganwadi centre. *Shodh, Samiksha aur Mulyankan International Research Journal* 2009;2(7):135-8.
  11. Singh S. Impact of Pre School Education Program of ICDS on Children in Rural Punjab. *The International Journal of Social Sciences and Humanities Invention* 2013;3(8):25–31.
  12. Kesari KK, Prasad Ranu, Handa Ruchika. Effect of undernutrition on Cognitive development of Children. *International Journal of Food, Nutrition and Public Health* 2010;2(3):15-1
  13. Kang Y, Aguayo VM, Campbell RK, West KP Jr. Association between stunting and early childhood development among children aged 36-59 months in South Asia. *Matern Child Nutr* 2018 Doi:10.1111/mcn.12684. PMID: 30499257; PMCID: PMC6588083
  14. Wachs TD, Geogieff M, Cusick S, McEwen B. Issues in the Timing of Integrated Early Interventions: Contributions from Nutrition, Neuroscience and Psychological Research. *Annals of the New York Academy of Sciences* 2014;1308:89-106.
  15. Alam MA, Richard SA, Fahim SM, Mahfuz M, Nahar B, Das S, et al. Impact of early- onset persistent stunting on cognitive development at 5 years of age: Results from a multi-country cohort study. *PLoS ONE* 2020 15(1): e0227839. Doi:10.1371/journal.pone.0227839