

Assessment of Anganwadi and Home Based Children on Cognitive Skills

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Abstract

Cognitive development of young children has always been a matter of concern, especially for the disadvantaged groups in India. The Government of India has initiated several programmes with a view to stimulate the cognitive development of these groups. Integrated Child Development Services Scheme, one of the largest child welfare programmes in the world also includes this aspect of development in its objectives. The focus of the present paper is on the study of differences in cognitive skills of young children attending anganwadi centers (AW group) and utilizing preschool services of ICDS and those who are not attending any preschool education program (HB group) so as to assess the possible effect of preschool education in anganwadi centers on these skills. Six cognitive skills namely conceptual skills, information, comprehension, visual perception, memory and object vocabulary were selected for investigation. The results obtained after data analysis revealed that anganwadi children performed better scores consistently across all dimensions as compared to home based children. Gender differences and developmental progression has also been observed. Females in both the groups scored higher than males on Conceptual skills. Age trend showed increase in Cognitive development of Anganwadi children with increase in age whereas the Home Based Children in 5-6 years of age showed declining trend on the indicators of Information and Object Vocabulary. Observations conducted to assess the context of development revealed several stimulating objects and persons observed in the anganwadi setting, thus accounting for the differences. Home as a context however, was also seen to be a place of active stimulation which could be utilized further. ICDS centers in Jammu exhibit several unique characteristics in the aspects of cultural context and the current situation due to turmoil in J & K state. An assessment of effect of intervention due to stimulation provided at anganwadi centers could help the planners build up data base at the national level and make policies specific for this area. The research findings also have implications for improvement of ICDS centers and for enhancing cognitive development of children in Jammu.

Keywords: Integrated child development services, Cognitive development, Preschool children, Early intervention, ICDS impact, Thought.

Introduction

ICDS programme, started in India in 1975, is the largest programme of early childhood development in India. Non formal preschool education is one of its most important component. Anganwadi is the focal point for providing stimulation to young children to enhance their cognitive development. Young children are not only growing physically during early childhood, they are also growing mentally. Children of this age continue to advance their skills through observing and interacting with the world around them. They try to learn how to process, store, elaborate and use information. Cognition in its real meaning refers to the higher processes involved in understanding and dealing with the world around us. Cognitive development is intimately linked to the development of emotions, language and physical development. Cognition is also referred to as a covert mental process; encompassing processes such as thinking, remembering, perceiving, planning, choosing, fantasizing and even dreaming. Simply it can be defined as an activity of knowing: mental process through which knowledge is acquired and problems are solved. Several eminent theorists have documented their perspectives on cognitive development of young children. Some of the perspectives, both Western and Indian have been presented in Fig 1 (a and b) respectively.

Figure 1 (a): Selected Western Perspectives on Cognitive Development

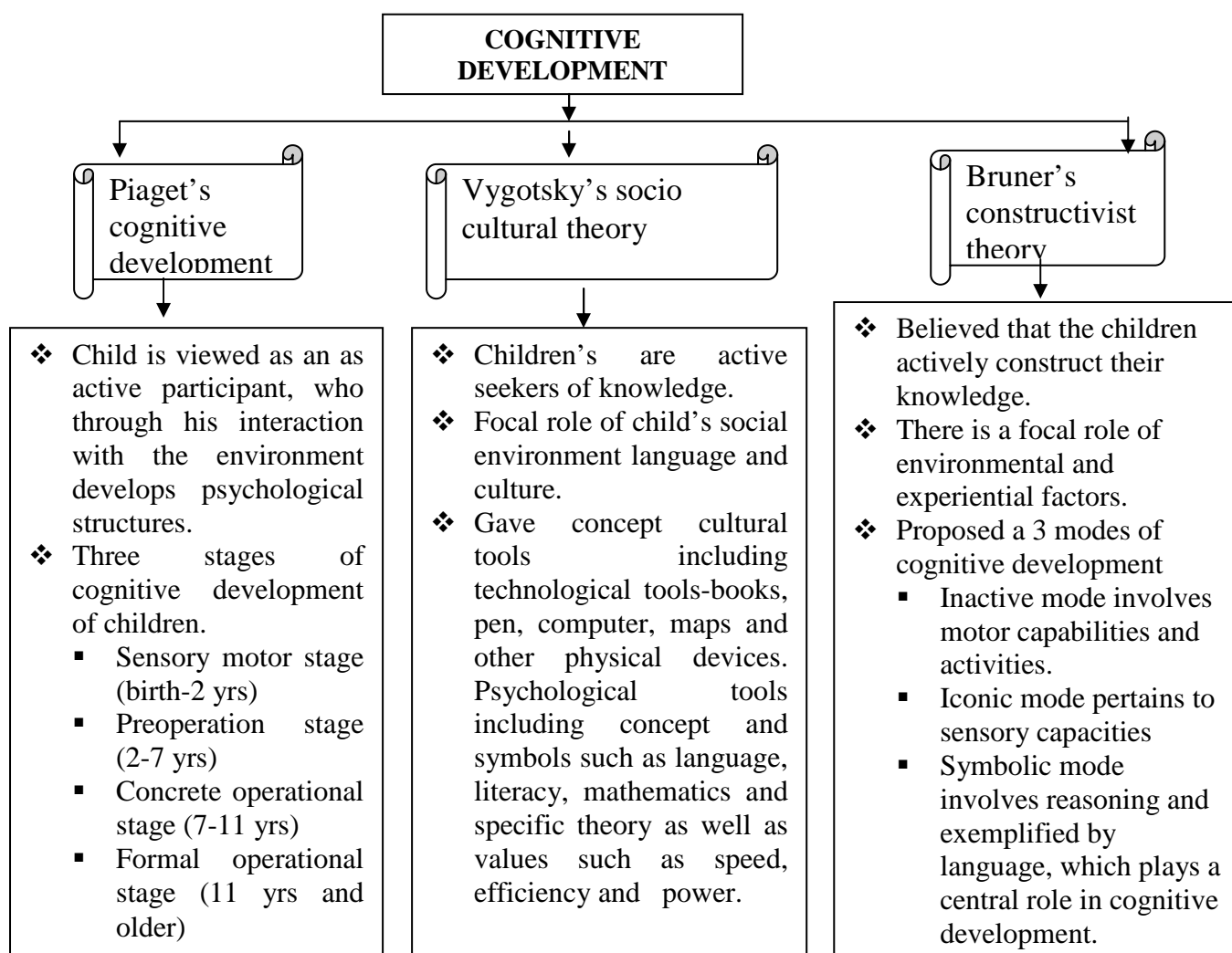
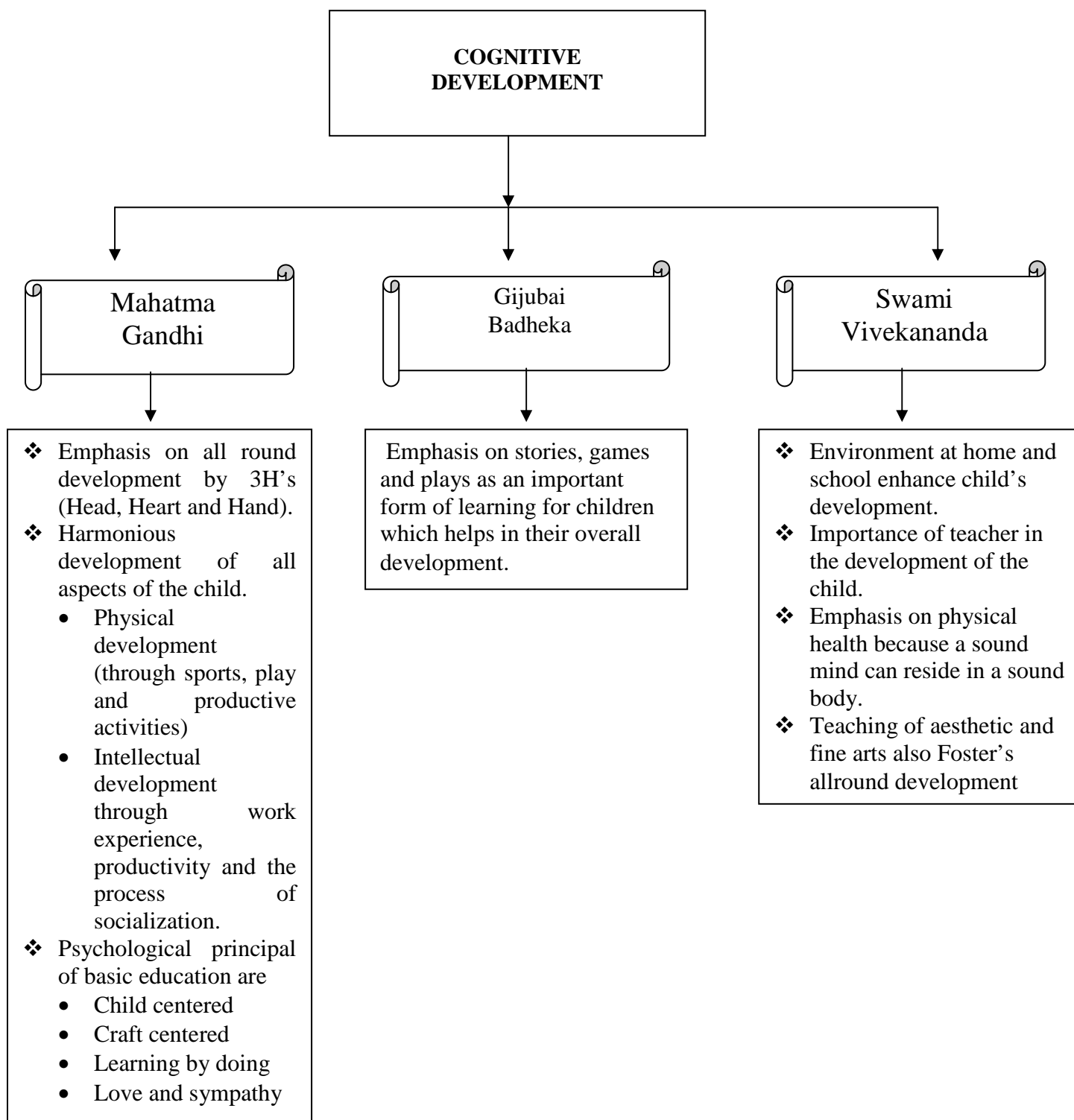


Figure 1 (b): Selected Indian Perspectives on Cognitive Development

There are various factors which affect the cognitive development of the child. Ecological context, socio-cultural setting and economic factors are some macro level factors while home environment, nutrition, facilities at school are some micro level environmental factors. Age and gender of children have also been found to affect cognitive development. (Aeri and Singh, 2002). A study on cognitive development was conducted by Jaswal (1988) using self constructed cognitive scale comprising of nine abilities namely auditory and olfactory

discrimination, thinking, comparison, identification, achievement/ performance and memory power ability. It was revealed that the cognitive ability showed age difference with positive advancement with increase in age. The development of the entire cognitive task was found to be concurrent but not uniform. Alim (2005) worked on the pattern of cognitive development and sex difference in acquisition of cognitive development among preschool children. Preschool children's cognitive development was tested using Pandey's Cognitive Development Test with six indicators including conceptual skills, information, comprehension, visual perception, memory and object vocabulary. On the basis of the findings, it was concluded that boys and girls differed in comprehension and conceptual skills whereas no significant difference was found in information and object vocabulary. Bhatia (1990) concluded in his study that overall cognitive abilities increase rapidly up to 4 years. After 4 years of age a slight decrease was observed in 4- 4.5 years of age and then increase in the cognitive ability was gradual and steady. There are multiple ways to foster cognitive development during the preschool years such as reading books, asking the child to read the symbols (pictures and illustrations) in picture books, drawing, paper cutting etc (Loop, 2009). According to Nugin (2007) the child cannot be developed, but it is possible to create necessary preconditions for child's development. The home and school environment play important role in cognitive development. In India, majority of children do not receive the required stimulation at home due to acute problems of poverty and literacy. Their parents are able to contribute only to a limited extent to the child's socio- emotional or cognitive development (Najineem et al 2004). Some environment offer little incentives to learn, others encourage most effective learning which the child is capable of. Fischbein (1980) found that the rearing environment conditions and stimuli are first and foremost created for supporting child development. The rearing environment is very powerful supporter of development and it is essential that teacher/parents of preschooler could use in all the possibility that predispose children's development. Moreover, the quality of stimulation goes long way in ensuring efficient processing of child's development. The most important positive factors in the environment of children from 2-6 years of age are appropriate play materials and equipments, playmates, instruction and guidance, and tasks that are challenging, but not too difficult (Weinstein and David, 1987).

It has been proved beyond doubt that intervention during early years of life enhances cognitive development significantly. Many studies have assessed the role of intervention provided at anganwadis in fostering this development and most of them have reported positive effects of interventions. Recently, Gupta et al (2010) revealed that intervention to improve the early childhood education and development component through AWCs results in improvement in the development and intelligence of children. Similarly, Sahni and Agarwal (1987), Mohanty and Hejmadi (1992) and Mishra (1994) reported that intervention programme had significant effect on the cognitive abilities of preschool children of age 3-6 years. A comparative study on ICDS and non- ICDS children (3-6 years) by Sharma (2004) found that all cognitive abilities increase with age and there is significant difference between ICDS and non-ICDS children. The non formal preschool education component of ICDS has played a significant role in enhancing cognition among children. The study on Impact of Integrated Child Development Services on Cognitive Abilities of Rural Preschool Children indicated that cognitive abilities of preschoolers who availed the ICDS package services was significantly better than that of non-ICDS group (Najineem et al,2004). The findings of Baradha and Jothimani (1994) revealed that children attending anganwadi were able to perform the cognitive abilities wherein they were able to identify minute differences of a picture indicating better cognitive ability. Similarly Adish et al (1988) stated that due to exposure to programme, intellectual status of the ICDS children was definitely better than non- ICDS. There was significant difference in cognitive and overall development of children of ICDS and non- ICDS preschoolers. Anganwadis have also played important role in child school readiness which is critical to later academic achievement and school performance. The children in ICDS areas showed significant better state in scholastic variables such as regularity in school, academic performance and general behaviour in the school (Chaturvedi et al, 1987 and Singh, 1997).

The studies cited above have been conducted in different cities across India but none of the studies of this nature was found for the present context (Jammu district of J & K state). ICDS centres in Jammu exhibit several unique characteristics in the aspects of cultural context and the current situation due to turmoil in J & K state. An assessment of effect of intervention due to stimulation provided at anganwadi centers could help the planners build up data base at the national level and make policies specific for this area. The research findings also have implications for improvement of ICDS centers and for enhancing cognitive development of children in Jammu.

Keeping all this in view, the objectives undertaken were to assess selected cognitive skills of children (3-6 years) belonging to low SES urban families staying at home (HB Group) and those attending preschool educational activities in ICDS centers (AW Group); Study the difference, if any, in these selected aspects of HB and AW group of sample children; Observe age and gender related trends in relation to cognitive skills of sample children.

Research Methodology

The research design adopted to meet the objectives of the study has been described below:

The Context of Study

The slum inhabitants included as sample groups in the present research had mainly migrated from the rural areas of different states (Bihar, Chattisgarh, Orissa, Uttar Pradesh, Madhya Pradesh) of India. They had migrated since five years along with their families for better livelihood. The observation, data related to environmental indicators shows that they had poor housing and living conditions. Dilapidated housing and lack of basic services as safe drinking water, toilet facilities expose slum residents to a variety of risks. A large majority of households in slum areas were semi-pucca and pucca. Most of the houses were small and were located close to each other. They often lacked proper ventilation. The space available for play and other outdoor activities for these sample children was inadequate and often unhygienic. Readymade toys or other play materials were hardly ever found. Most of the children were seen playing using local material for their play activities. These included stones, sticks, tyres, wool, wood, outings etc. The local games played by slum children were pebbles (geetey); stapu etc.

The Sample

The sample of the study comprised of two groups

Group I: Comprised 200 children in the age group 3-6 years who were not attending any preschool center. This group was referred to as the Home Based Group (HBG).

Group II: Consisted of 200 children of the same age group who were attending the anganwadi centers which mean not only the enrolled children in ICDS centers but also visiting and availing preschool component of ICDS. This group was referred as Anganwadi Group (AWG).

Both the groups were selected from the similar socio economic settings (i.e urban slum areas of Jammu District) after matching them on several variables (occupation, income, parental educational qualification, etc) by using standardized tool of socio economic status scale (Madhosh and Raffique;1993).

For sample selection, the list of the anganwadis according to the blocks in Jammu district was obtained from the social welfare department and ICDS projects head office from which two urban blocks (Jammu and Gandhinagar) were selected. Further, ten anganwadis from these sampled blocks were selected randomly and from each anganwadi, 20 children were included as sample. Only those anganwadis were selected which were located in urban slum areas of Jammu District where preschool component of ICDS takes place actively with at least twenty children in each anganwadi. For HBG, 200 children (3-6 yrs) who were not attending

anganwadi or any other preschool from the same setting as that of anganwadi children were selected by lottery method. These children were contacted with the help of local person and anganwadi workers in the particular area. The list of children was prepared and children were selected randomly till the required sample was obtained.

In order to collect data, the instruments used were:

- Cognitive Development Test for Preschoolers by Pandey (1992). It is a standardized English version tool. It is an action test which measures the cognition in children by verbal and non- verbal items. It includes 6 sub- tests namely: conceptual skills, information, comprehension, visual perception, memory, object vocabulary.
- Observations: Observations at anganwadis and homes of the sample children were done to see what kind of tools/materials were used in both the settings to enhance cognitive development of children.

Data Collection

The data collection was done during the period of 2008-2009. The administration of cognitive test took on an average 1 hour for each sample child. Though there was no time limit, the child was given sufficient time to complete all the sub-tests .It was administered individually and orally, in the separate area after establishing rapport with children. The test material was arranged systematically in order to present action and to avoid distractions. Finally the investigator started asking questions with adequate praise and encouragement to the child and test results were recorded simultaneously on the scorecards. Observation was conducted to assess the stimulating objects, persons, activities in home and anganwadi centers that affect their cognitive abilities.

Results and Discussion

In the present study, an equal number of HB and AW children were selected for inclusion in the sample. The distribution of the sample in Table 1 shows that there were more females (57%) than males (43%) in the sample.

Table 1: Distribution of Sample According to age and gender

AGE (in years)	HBG (n=200)		AWG (n=200)		Total (n=400)	
	M	F	M	F	M	F
3-4	43(21.5)	83(41.5)	53(27)	56(28)	97(24.25)	139(34.75)
4-5	11(5.5)	36(18)	35(17.5)	8(4)	46(11.5)	44(11)
5-6	3 (1.5)	24(12)	25(12.5)	22(11)	28(7)	46(11.5)
Total (3-6)	57(28%)	143 (72%)	114 (57%)	86 (43%)	171(43%)	229 (57%)

It is evident from the table 2 that Anganwadi children showed better performance on all the dimensions of Cognitive development (significant for Conceptual skills, Information, Comprehension and Visual perception)except on Object vocabulary in comparison to Home Based Group. An analysis of the mean scores shows that the difference between the two groups was most evident on the dimension of conceptual skills which included understanding

of the concept of shape, size, colour and number. The AWG was more heterogeneous on this aspect ($SD \pm 5.68$) than HBG which showed more uniformity ($SD \pm 3.55$) in this aspect. On the dimension of information, the HB group children showed more deviation (± 4.02) than AW group (± 1.20). On object vocabulary, HB children were seen performing better than AW group, although the difference was not significant.

Table 2: Mean Scores and Standard Deviation of Sample Children (3-4 Years) on Cognitive Development Scale

SUB-TESTS	HOMEBASED GROUP			ANGANWADI GROUP			t-value
	Males	Females	Overall	Males	Females	Overall	
Conceptual skills	8.18+2.99	7.13+3.77	7.65+3.55	11.33+5.89	12.25+5.67	11.79+5.68	8.74*
Information	1.86+1.22	1.87+3.83	1.86+4.02	2.92+1.25	2.71+1.15	2.81+1.20	3.58*
Comprehension	2.95+0.99	2.14+0.98	2.54+1.00	3.85+1.27	3.83+0.66	3.84+1.00	2.33*
Visual Perception	0.86+1.39	1.20+1.43	1.03+1.42	2.88+2.04	2.41+1.72	2.64+1.89	7.63*
Memory	3.30+1.31	3.40+1.60	3.35+1.51	4.12+2.80	3.10+2.53	3.61+2.66	1.21
Object Vocabulary	4.37+1.51	4.28+1.63	4.32+1.58	4.33+1.84	4.17+2.06	4.25+2.22	0.36

* significant difference, $\alpha = 0.05$, table value = 1.64

Table 3 reveals that AW children aged 4-5 years also (like children of 3-4 years of age) scored more than the children of HBG on all indicators of Cognitive development scale. Significant difference between HBG and AWG was seen on all dimensions of Cognitive development scale except on Information dimension. The standard deviation values of HBG show maximum heterogeneity in information followed by conceptual skills. For AW group, maximum deviations were found in Conceptual skills dimensions of the sub scale. Across gender analysis reveals that females (4-5 years) from the HB group performed better on all dimensions as compared to males from their group. In the Anganwadi group, males performed better than females on all except one dimension (i.e. Information).

Table 3: Mean Scores and Standard Deviation of Sample Children(4-5 Years) on Cognitive Development Scale

SUB-TESTS	HOMEBASED GROUP			ANGANWADI GROUP			t-value
	Males	Females	Overall	Males	Females	Overall	
Conceptual skills	10.00+4.89	11.33+3.68	10.66+3.96	22.0+4.61	20.37+5.57	21.18+4.77	24*
Information	2.08+0.40	3.16+1.44	2.98+4.86	4.14+1.80	4.87+1.72	4.50+1.79	1.13

Comprehension	3.27+1.19	3.58+0.99	3.42+1.03	4.05+0.59	4.12+0.83	4.08+0.63	7.07*
Visual Perception	1.63+1.43	2.02+1.38	1.82+1.38	5.08+1.98	5.25+2.25	5.52+2.02	21.5*
Memory	3.36+2.11	4.72+2.03	4.04+2.11	7.28+1.01	6.75+1.28	7.0+1.07	21.7*
Object Vocabulary	4.81+0.98	5.05+0.79	4.93+0.83	5.94+0.33	5.87+0.35	5.90+0.33	24.8*

* significant difference, $\alpha= 0.05$, table value= 1.64

Table 4 reflects the scores of 5-6 year old sample children on Cognitive development scale for both HBG and AWG. The trend observed for the younger age groups was found to be repeated for this age group also. Anganwadi children surpassed their HBG counterparts on all aspects of the scale. The difference was significant on all the dimensions. The females in the Anganwadi group performed better than the males of the same group. Females of HBG performed better (only marginal differences) on the aspect of Comprehension, Visual perception, Memory and Object vocabulary as compared to the Home Based males.

Table 4: Mean Scores and Standard Deviation of Sample Children (5-6 Years) on Cognitive Development Scale

SUB-TESTS	HOMEBASED GROUP			ANGANWADI GROUP			t-value
	Males	Females	Overall	Males	Females	Overall	
Conceptual skills	13.0+6.0	10.25+3.94	11.62+4.16	22.72+4.87	24.74+3.9	23.74+4.5	38.5*
Information	3.0+2.0	2.37+1.17	2.68+1.25	4.08+2.08	6.77+1.65	5.42+2.33	14.7*
Comprehension	3.33+0.57	3.62+0.71	3.47+0.69	5.04+0.78	5.90+1.15	5.47+1.05	22.7*
Visual Perception	2.0+1.73	2.37+1.68	2.18+1.66	6.44+1.50	7.04+0.65	6.74+1.21	31.4*
Memory	4.33+1.52	4.66+1.83	4.49+1.77	8.84+1.10	9.09+1.41	8.96+1.25	25.3*
Object Vocabulary	4.66+0.57	4.95+1.08	4.80+1.03	6.0+0.0	6.0+0.0	6.0+0.0	11.8*

* significant difference, $\alpha= 0.05$, table value= 1.64

Table 5 reflects the mean scores of both the groups HBG and AWG according to age. The overall mean scores show that there was developmental difference across the age span among all the age groups in anganwadi settings. There was advancement of Cognitive scores found with age. In HBG, the children of 5-6 years of age showed declining trend on the components

of Information and Object vocabulary whereas other aspects namely Conceptual skills, Comprehension, Visual perception, and Memory showed increasing trend with increase in age.

Table 5: Mean Scores of Sample Children (Age-Wise)

SUB-TESTS	HOMEBASED GROUP				ANGANWADI GROUP			
	3-4	4-5	5-6	Overall	3-4	4-5	5-6	Overall
Conceptual skills	7.65	10.66	11.62	9.97	11.79	21.18	23.74	18.90
Information	1.86	2.98	2.68	2.50	2.81	4.50	5.42	4.24
Comprehension	2.54	3.42	3.47	3.14	3.84	4.08	5.47	4.46
Visual Perception	1.03	1.82	2.18	1.67	2.64	5.52	6.74	4.96
Memory	3.35	4.04	4.49	3.96	3.61	7.0	8.96	6.52
Object Vocabulary	4.32	4.93	4.80	4.68	4.25	5.90	6.0	5.38

The mean scores according to gender of HBG and AWG (Table 6) indicated that girls of HBG scored higher on conceptual skills (21.87) than AWG with mean score of 19.12. Whereas females of AWG performed better on other dimensions of cognitive scale namely Information (4.78), comprehension (4.61) and Visual Perception (4.09) than girls of HBG (whose mean scores were 2.46, 3.11 and 1.86 respectively). Females of both the group scored higher on Conceptual skills as compared to males. However, overall males of AWG scored high on all the indicators of cognitive scale than the males of HBG.

Table 6: Mean Scores of Overall Sampled Children(Gender-Wise)

SUB-TESTS	HOMEBASED GROUP			ANGANWADI GROUP		
	Males	Females	Overall	Males	Females	Overall
Conceptual skills	10.39	21.87	16.13	18.68	19.12	18.09
Information	2.55	2.46	2.50	3.71	4.78	4.24
Comprehension	3.18	3.11	3.14	4.31	4.61	4.46
Visual Perception	1.49	1.86	1.67	5.04	4.09	4.97
Memory	3.66	4.26	3.96	6.74	6.31	6.52
Object Vocabulary	4.61	4.76	4.68	5.42	5.34	5.38

Discussion

The findings of the present study conducted in ICDS Centres in urban slums of Jammu region revealed that Anganwadi children obtained better scores consistently across all dimensions as

compared to home based children thus pointing to the positive role of AWC on their cognitive development. Similar results were found by Sharma (2004) indicating that non formal preschool education component of ICDS has played a vital role in enhancing the abilities of children. An analysis of the mean scores of the children showed that the differences among the two groups were more evident on the dimensions of conceptual skills. All children of anganwadi centers showed higher scores on conceptual skills than other aspects probably due to the preschool activities component involving charts, models, activities, etc which was somehow missing among the children staying at home. When trends of sample children according to age on different abilities on cognitive development was observed, it was found that scores of anganwadi children were consistently increasing with age on all the indicators of cognitive development. In Home Based Group, the children in 5-6 years of age group showed declining trend on the abilities of information and object vocabulary. Gender differences and developmental progression was also observed among both groups. Observations conducted to assess the context of development revealed several stimulating objects and persons in the anganwadi settings. Environment of AWCs was not very conducive but comparatively better than the home. Home as a setting however, was also seen to be a place of active stimulation which could be utilized further.

Table 7: Comparison of Results with Previous Research

Name / Year / Place of Investigation (where available)	Previous Studies			Present Study
	Overall Cognitive Development	Age Related Trends	Gender Related Trends	
Sharma (2004) <i>Jammu</i>		Found that all cognitive abilities increase with age. There is significant difference between ICDS and non-ICDS children.		Similar result was found among anganwadi children in the present study. Their cognitive abilities increased with age.
Najineem et al (2004); <i>Dharward Taluk</i> ; Adish etal (1988); Mohanty & Hejmadi(1992); Mishra (1994)	Cognitive abilities of preschools who availed the ICDS package services were significantly better than that of non-ICDS group.		Boys and girls had similar cognitive scores.	Similar finding were found in which cognitive scores of ICDS children was better consistently across all dimensions as compared to home based children.
Archana (1998)			Gender does not exercise any significant influence on the	In the present study gender difference was found among

		intelligence level.	both the groups.
Bhatia (1990) <i>Jammu</i>	Overall cognitive abilities increase rapidly upto 4 years. After 4 years of age a slight decrease was observed in 4-4.5 years of age.		Among the home based group of the present study, there was rapid increase up to four years in all the cognitive abilities after 4 years of age slight decrease was observed in the indicator of information and object vocabulary
Alim (2005) <i>Aligarh</i>		Boys and girls differed on comprehension and conceptual skills whereas no difference was found in Information and Object vocabulary.	There was significant difference between boys and girls in almost all the subtests. Females of both the groups scored higher on conceptual skills where males of anganwadi performed better than HBG on all sub-tests of cognitive development.
Jaswal et al(1988) <i>Jammu</i>		It was revealed that the cognitive ability showed age difference with positive advancement with increase in age.	Similar results was observed among Anganwadi children.
Weinstein and David (1987)	The most important positive fastors in the environment of children from 2-6 years of age all appropriate play materials and equipment		Observations conducted to assess the context of development indicated several stimulating objects and persons in the AWC. Environment of

instruction and
guidance and
tasks.

AWC was not
that conducive
but comparatively
better than the
home based
children.

The results of the present study have been compared with previous research investigation (Table 7) with a view to draw inferences regarding trends in Cognitive development among 3-6 years of children. The results of the previous as well as the present study indicate that cognitive development of children who availed ICDS services were significantly better than the non-ICDS group. Studies on age related trends linked with the present study found that cognitive abilities increase with age.

Conclusion

- Anganwadi children showed better performance on all the dimensions of cognitive development. An analysis of the mean scores shows that the difference between the two groups was most evident on the dimension of conceptual skills which included understanding of the concept of shape, size, colour and number.
- The Anganwadi children showed consistent increase in mean value scores on all the indicators of cognitive development with increase in age whereas home based children in 5-6 years of age showed declining trend on the abilities of information and object vocabulary.
- Both Home Based Group and Anganwadi Group females scored higher than males on conceptual skills.

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