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Impact Of Early Childhood Nutritional Status On Cognitive Development

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Abstract

The present study was carried out to assess the relationship between nutritional status and cognitive abilities of preschool children Hundred subjects (50 girls and 50 boys), aged 3-5 years were randomly selected from five schools of Kumarganj, Faizabad district of eastern U. P. Anthropometric measurements were taken as per standards. Standardized Payday's cognitive development test was administered on children to find out the cognitive abilities of pre schoolers. The results revealed that there exists a significant relationship between nutritional status and cognitive abilities of preschool children.

Introduction:-

Children are our future citizen and they form an important segment of Indian population. They contribute to the vital human potential and impart strength to the national economy and development The better nutritional status of the children, the higher will be the nation's rise. Nutrition's in the childhood is the basis for survival and good health in adulthood. Inadequate nutrition in childhood may lead to malnutrition, growth retardation, reduced work capacity and poor mental and social development.

Cognition is the most important resource of any country Indian children in general and some sectors in particular start with a deficit in nutrition and deficit perpetuates with time affecting their cognitive and physical ability (Panda K Akshya, 2008).

Development of cognitive ability depends on various factors, like heredity, family atmosphere, nutrition, availability of stimulation environment and several agencies which directly or indirectly help in development of cognitive ability nutrition in early years may have permanent effect on some part of the brain and nervous system. The relationship between under nutrition and mental development of children in still controversial and has caused much global concern. In view of this, the present study was conducted to study the relationship between nutritional status and cognitive abilities of pre-school children.

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Materials and Methods:-

The present study was carried in Kumarganj, Faizabad district of eastern U.P. Hundred subjects (50 girls and 50 boys), aged 3-5 years were randomly selected from five schools. The anthropometric measurement viz .height and weight were measured by standard techniques (Jellife,1996). Estimation of standing height was done with shoes off and body straight, against the anthropometric rod, measured nearest to 0.5 cm. Platform spring balance was used for recording weight in kg with school uniform and without shoes. Further nutritional status was assessed using different indices based on height and weight of children according to Gomez (weight for age) and Waterlow (height for age). Standardized Panday's Cognitive Development Test (PCDTP) was used for pre-schoolers was administered on each child individually to find out the cognitive abilities of children. PCDTP measures the cognitive abilities in children by verbal and non-verbal items. It includes six sub tests: conceptual skills, information comprehension, visual perception, memory and object vocabulary. Various statistical applications like frequency, percentage, and chi square were calculated.

Results and Discussions:-

The results regarding the relationship between weight for age and cognitive abilities of preschool children revealed highly encouraging results. 26.92 per cent girls having normal weight for age had high cognitive abilities whereas 73.07 per cent were in category of average cognitive abilities and none were found to have low cognitive abilities (Table - 1). Among girls with mild malnourishment (weight for age) 8.33 per cent, 54.16 per cent and 37.5 per cent were in the category of high average and low cognitive abilities respectively.

Boys cognitive abilities were also better among children having normal weight for age 28.57 per cent boys having normal weight for age were found to have high cognitive abilities whereas 71.42 per cent had average and none were in the category of low cognitive abilities. In case of mildly malnourished (weight for age) the percentage of children having high, average and low cognitive abilities were 13.63 per cent, 50 per cent and 36.36 per cent which are statistically significant.

It can be concluded that nutritional status affects the cognitive abilities and children with better nutritional status had better cognitive abilities. The malnourishment affects the physical as well as cognitive development of the pre-school children. Similar result was found by Hemlata (2000) that malnourished children are poorer in their performance on mental abilities test when compared to well nourished children. Riccuti (1991) also reported that growth, brain development and the mastery of motor skills are dependence on adequate nutrition of the children.

Relationship between nutritional status and cognitive abilities of pre-school children (Table -2) shows that 20 per cent of the girls having normal height for age had high cognitive abilities whereas 76 per cent had average cognitive abilities and only 5 per cent had low cognitive abilities. The result shows statistically significant effect of nutritional status (height for age) on cognitive abilities of the girls. Almost similar result was observed in case of boys were 27.02, per cent 70.27 per cent and 2.70 per cent with normal height for age had high, average and low cognitive abilities.

Boys cognitive abilities and their height for age were also significantly different. It can be concluded that for better cognitive abilities a better nutrition is desirable. Similar findings have been shown by Dell (1999) who found that poor nutrition among children diminish their cognitive development. They also found that well nourished diet helps to increase the attention and concentration of children's producing gains and cognitive function and learning. Burchina (1997) reported that pattern of cognitive development are associated with intensive early nutrition child care and responsive stimulating care at home. Further Chen (2001) also reported malnourished children tend to have lower IQ and impaired cognitive abilities. Kim (2008) investigated that under nutrition is related to improper physical and mental growth.

Conclusion:-

Nutrition plays a very important role in physical and mental development of child. In present study the preschool children who had normal nutritional status weight for age and height for age had high and average cognitive abilities. However, mildly malnourished preschool children had low cognitive abilities. Poor nutrition of children not only adversely affects the cognitive development of children, but also likely to reduce the work capacity in future.

Table 1 - Relationship between weight for age and cognitive abilities of pre-school children.

S. No.	Girls (n=50)						Boys (n=50)					
	Nutritional status weight for age	n	Cognitive abilities of pre-schoolers			X^2	Nutritional status height for age	n	Cognitive abilities of pre-schoolers			X^2
			High	Average	Low				High	Average	Low	
1	Normal	26	7 (26.92)	19 (73.07)	-	12.842*	Normal	28	8 (28.57)	20 (71.42)	-	33.93*
2	Mild	24	2 (8.33)	13 (54.16)	9 (37.5)		Mild	22	3 (13.63)	11 (50)	8 (36.36)	
Total		50 (100)	9	32	9				11	31	8	

Figure in parenthesis indicate percentage

*Significant at 5% level

Table 2 - Relationship between height for age and cognitive abilities of pre-school children.

S. No.	Girls (n=50)						Boys (n=50)					
	Nutritional status height for age	N	Cognitive abilities of pre-schoolers			X^2	Nutritional status height for age	n	Cognitive abilities of pre-Scholars			X^2
			High	Average	Low				High	Average	Low	
1	Normal	40	8 (20)	30 (75)	2 (5)	24.19*	Normal	37	10 (27.02)	26 (70.27)	1 (2.70)	18.921*
2	Mild	10	1 (10)	2 (20)	7 (70)		Mild	13	1 (7.69)	5 (38.46)	7 (53.84)	
Total		50 (10	9	32	9				11	31	8	

Figure in parenthesis indicate percentage

*Significant at 5% level

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