A comparative study on anthropometric measurements of ICDS and Non-ICDS children in selected blocks of Kangra district of Himachal Pradesh

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Abstract

The present study was undertaken with specific objectives to assess the anthropometric measurements of ICDS and non- ICDS children and the factors affecting them. The study was conducted in Bhawarna and Sulah blocks of district Kangra of Himachal Pradesh. A total sample of 150(100 ICDS and 50 Non-ICDS) preschoolers in the age group of 3-6 years was randomly selected. The data were collected through self structured interview schedule. The findings indicated that anthropometric measurements of both ICDS & non- ICDS respondent's were less than the National Center for Health Statistics (NCHS) standards with few exceptions in case of female ICDS respondents where BMI was higher than National Center for Health Statistics (NCHS). In case of female non-ICDS respondents, ratio of chest/head circumference was higher than the National Center for Health Statistics (NCHS). On applying the coefficient of correlation, age and income of the ICDS respondents was significantly correlated with height and weight whereas in case of non-ICDS respondents, age and income was significantly correlated with height and BMI of the respondents.

Introduction

Physical development is the process that starts in human infancy and continues unto late adolescence. Physical development involves developing control over the body, particularly muscles and physical coordination. The peak of physical development happens in childhood and is therefore a crucial time for neurological brain development and body coordination to encourage specific activities such as grasping, writing, crawling, and walking. Growth is the increase in size of the body (and its parts) whereas development is the functional maturation, and acquisition of skills.

Normally, growth and development go hand in hand i.e. the child matures in all aspects of his being; height, weight and growth of organs, acquisition of neuromuscular control, skills, emotional development, adaptation to stress, ability to assume responsibility and achieve freedom of expression. The physical growth to a great extent depends on the hereditary factors. Tonics and medicines have hardly, if any, role to play in increasing the height or to determine the development of a child. However, nutritional factors have a definite role in determining the growth. Infections in the mother, during her conception or ill health during her childhood would have an adverse effect on the growth and

development of her child.

Physical development is important because movement is the main way in which young children explore and learn. Regular physical activity combined with a healthy diet is an essential contributor to children's overall health and well-being. There is also evidence that low income and little education have shown to be strong predictors of a range of physical and mental health problems. High SES families provide conductive environment to grow not only physically but mentally also in terms of nutritious food, play material, healthy parent child relationships etc. Whereas children belonging to lower SES do not have access to the   physical environment, which their counterparts enjoy resulting in nutritional deficiencies like anemia, calcium deficiencies which in turn affect their physical development.

Keeping in view the importance of physical development of the child, the present study was planned with the objective to assess the anthropometric measurements of children   attending ICDS program and those not attending the same.

Materials and Methods

The study was conducted in Bhawarna and Sulah blocks of district Kangra of Himachal Pradesh. Initially a list of seven anganwadis from each selected block were randomly chosen. From the selected seven anganwadis, a sample of 50 children was chosen by employing proportional allocation method. Thus making a total sample of 100 ICDS children from two selected blocks. In the final stage, a complete list of all private schools was prepared and out of that list two private schools from each block were randomly selected. From the selected two private schools in a block, a sample of 25 children was chosen by employing proportional allocation method. Thus making a sample of 50 Non-ICDS children from two selected blocks.

The tools for data collection were self structured interview schedule and standardized scales. Data were collected by survey method on well structured schedule and standardized scales through personal interview method from the respondents. Efforts were made to collect the information under conditions considered congenial for obtaining valid and reliable responses. The purpose of study was well explained and rapport was built with the respondents to extract accurate information to extent possible from the respondents. Anthropometric measurements were calculated for the males as well as for females and were compared with National Center for Health Statistics (NCHS) standards.

After the collection of data the gathered information was tabulated on the master sheet. It was then computed in different forms. The data were analyzed statistically. The correlation test was used for the present study to find out the difference of variables between the male and female respondents and other variables.

Results and Discussion

Data in table 1 have been discussed under various subheads as below and it shows the anthropometric measurements of ICDS respondents:

1. Height: The calculated height of ICDS male and female respondents was found to be below the reference height i.e NCHS in all the age groups i.e from 3 years to 6 years.

2. Weight: Calculated weight of ICDS male and female respondents was less than the standard weight in ICDS respondents with the exemption among 3 years old and 6 years old female respondents whose calculated weight was slightly higher than the reference weight.

3. BMI: Calculated BMI of 4 year & 5 year old male respondents was slightly higher than the reference BMI. Whereas calculated BMI in case of female respondents for all age groups was higher than the reference BMI.

4. Triceps skin fold: Calculated triceps skin fold measurement was less than the reference triceps skin fold in case of both male & female respondents.

5. Mid Arm-circumference: Calculated mid arm

circumference in case of both male and female ICDS respondents was less than the reference mid arm-circumference for all age groups i.e 3-6 years.

6. Head and Chest circumference: Head circumference and chest circumference ratio was greater than or equal to 1.0 in all respondents. Results are supported by Bagyalakashmi and vijaylakshmi (2002) who presented the impact of ICDS services on the children in the age group of 3-4 years of age.

Data in table 2 show the anthropometric measurements of non-ICDS respondents and has been discussed under various subheads:

Height: Calculated height of 4 years old male respondents was higher than the reference height and calculated height of all remaining age groups was less than the reference height in case of non ICDS male respondents. Whereas calculated height of 3 years old and 4 years old female respondents was higher than the reference height and remaining all other age groups' calculated height was less than the

Table 1. Anthropometric measurements of ICDS respondents

Sr. No.	Variables	Age group							
		Boys				Girls			
		3 years	4 years	5 years	6 years	3 years	4 years	5 years	6 years
1	Reference Height/cm	94.9	102.0	109.9	116.1	93.9	101.6	108.4	114.6
	Calculated height/cm	91.84	92.86	98.06	105	90.8	92.4	97.75	103.8
2	Reference weight/kg	14.6	16.7	18.7	20.7	14.1	16.0	17.7	14.5
	Calculated weight/kg	13.34	14.19	16.07	17.0	14.37	14.56	15.91	16.33
3	Reference BMI	17.89	17.55	17.42	17.55	17.56	17.28	17.15	13.34
	Calculated BMI	16.47	17.62	17.54	16.24	18.35	18.53	17.91	15.58
4	Reference Triceps skin fold/cm	>10mm	>10 mm	>10 mm	>10 mm	>10 mm	>10 mm	>10 mm	>10 mm
	Calculated Triceps skin fold/cm	6.7	7.1	7.13	7.6	8.0	7.4	7.2	7.5
5	Reference mid-arm circumference /mm	14	1.2	14	13	14	14	15	14
	Calculated mid-arm circumference/mm	6.7	7.1	7.13	7.6	8.6	8.5	8.0	9.3
6	Calculated head circumference/cm	47.7	50.3	49.5	50.0	47.5	48.4	49.6	50.4
7	Calculated chest circumference/cm	51.15	49.6	50.2	50.5	50.0	48.5	50.2	50.8
8	Reference chest /head circumference	>1.0	>1.0	>1.0	>1.0	>1.0	>1.0	>1.0	>1.0
9	Ratio of chest &head circumference	1.07	0.98	1.01	1.01	1.05	1.00	1.01	1.00

Reference: NCHS standards

Table 2.   Anthropometric Measurements of non ICDS respondents

Sr. No.	Variables	Age group							
		Boys				Girls			
		3 years	4 years	5 years	6 years	3 years	4 years	5 years	6 years
1	Reference Height (cm)	94.9	102.0	109.9	116.1	93.9	101.6	108.4	114.6
	Calculated height (cm)	94.75	104.1	98.28	101.3	94.75	104.1	94.28	101.3
2	Reference weight (kg)	14.6	16.7	18.7	20.7	14.1	16.0	17.7	14.5
	Calculated weight (kg)	14.87	15.9	15.0	13.0	13.25	18.1	13.75	12.5
3	Reference BMI	17.89	17.55	17.42	17.55	17.56	17.28	17.15	13.34
	Calculated BMI	16.36	17.68	15.83	18.9	16.36	17.68	15.83	18.9
4	Reference Triceps skin fold (mm)	>10 mm	>10 mm	>10 mm	>10 mm	>10 mm	>10 mm	>10 mm	>10 mm
	Calculated Triceps skin fold(cm)	7.5	7.2	7.7	7.75	6.5	7.9	6.0	8.0
5	Reference mid-arm	14	1.2	14	13	14	14	15	14
	Calculated mid- arm Circumference(cm)	7.12	6.9	7.91	6.12	7.7	6.7	6.9	8.3
6	Calculated head circumference/cm	48.5	48.12	47.9	48.12	47.5	48.4	49.6	50.4
7	Calculated chest circumference/cm	50.0	49.7	48.7	49.3	50.6	49.3	50.0	50.0
8	Reference chest /head circumference	>1.0	>1.0	>1.0	>1.0	>1.0	>1.0	>1.0	>1.0
9	Ratio of chest &Head circumference	1.03	1.04	1.02	1.03	1.06	1.01	1.00	0.99

reference height National Center for Health Statistics (NCHS).

Weight: The calculated weight of all age group of male respondents was less than the National Center for Health Statistics (NCHS) with only exception among 3 year old whose weight was higher than National Center for Health Statistics (NCHS). In case of female respondents, the calculated weight of 3 year, 5 year and 6 year old respondents was less than National Center for Health Statistics (NCHS). In case of 4 years old female respondents, the calculated weight was higher than the National Center for Health Statistics (NCHS).

BMI: BMI of 4 years old and 6 year old male respondents was higher than the reference BMI. Whereas, BMI in case of 4 year and 6 year old female respondents was higher than the reference BMI.

Triceps skin fold: The calculated triceps skin fold

measurements in case of both male and female non-ICDS respondents were less than the reference standards.

Mid arm-circumference: Similarly calculated mid arm- circumference in case of both male and female non-ICDS respondents was less than the reference mid arm-circumference.

Head circumference and chest circumference : Head circumference and chest circumference ratio were greater than or equal to 1.0 in all respondents except in 6 year old girls. Similar findings have been reported by Biswas *et al.* (2009). Bose *et al.* (2007) also investigated the age and sex variations in height and weight and concluded that more boys were under weight than girls at age 3 years.

A keen examination of the results in table 3 shows that age and income of ICDS respondents had a positive relationship with height and weight at 5% level of significance. Present study results are supported by Biswas *et al.* (2009) who investigated the age and sex variation in ICDS children and also found the sex differences in height, weight and BMI.

A keen observation of results in table 4 shows that height, BMI had significant correlation with age whereas income had positive correlation with BMI at 5% level of significance Sabiha (1999) concluded that the socio-economic, demographic and environmental variables within a household affected the growth patterns of under-five Pakistani children and found that nearly all the socio-demographic, economic and environmental variables were significantly associated with height for age and weight for age.

Table 3. Relationship between age and income with anthropometric measurements of ICDS respondents

Sr. No.	Particulars of measurements	Value of Correlation with age	Value of Correlation with income
1	Height (cm)	0.187*	0.120*
2	Weight (kg)	0.130*	0.167*
3	BMI	-0.03 NS	-0.00 NS
4	Triceps skin fold (mm)	0.07*	-0.01 NS
5	Mid- arm circumference (cm)	0.003 NS	0.07*
6	Chest circumference	0.15*	0.17
7	Head circumference	0.000 NS	0.07

*Significant at 5% level, NS-Non significant

Table 4. Relationship between age and income with anthropometric measurements of non- ICDS respondents

Sr. No.	Particulars of measurements	Value of Correlation with age	Value of Correlation with income
1	Height (cm)	0.16*	0.013 NS
2	Weight (kg)	0.003 NS	-0.04 NS
3	BMI	0.18*	0.16*
4	Triceps skin fold (mm)	-0.005 NS	0.23 NS
5	Mid- arm circumference (cm)	0.03 NS	0.26 NS
6	Chest circumference	0.00	0.07 NS
7	Head circumference	0.19	0.07 NS

*Significant at 5% level, NS-Non significant

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