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A study on malnutrition in 7-9 years of school going children in the Lohardaga district of Jharkhand

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Abstract
Introduction: Jharkhand is among the top five states with malnourished – including stunted, wasted, and underweight children, according to an analysis of data from the ministry of health and family welfare's National Family Health Survey, 2015-16 (NFHS-4).
Objectives: To find out the prevalence of malnutrition in 7-9 years old school going children in the Lohardaga district of Jharkhand.
Methodology: The present study was conducted at two blocks that is Bhandra and Kairo in the Lohardaga district of Jharkhand. The study was carried out between 2018-2019 through personal interviews using a pre-tested schedule. The total sample consists of 200 school going children of rural area of the selected district. Children's height and weight were taken to find out the prevalence of malnutrition.
Result and Conclusion: According to Waterlow's classification, based on height for age (stunting), the maximum of 200 respondents, 55.5 percent of boys and girls had mild malnutrition, a minimum14 percent had moderate malnutrition and 30.5 percent of children were normal. Similarly, based on weight for height (wasting) maximum of 200 respondents, 45 percent of boys and girls had moderate malnutrition, 32.5 percent had severe malnutrition, 16.5 percent had mild malnutrition, and 6 percent of children were normal.
Health, Nutrition, and personal hygiene education may be made as a part of the school curriculum apart from the regular educational activities in the School.

Keywords: Malnutrition, school going children, Jharkhand

Introduction
As seen from the national figures, under-nutrition is a prime concern in almost all states; however, it is more prominent in some of the Empowered Action Group (EAG) states viz. Bihar, Jharkhand, Uttar Pradesh, Madhya Pradesh, and Rajasthan. In this regard, the paper attempts to investigate the nutritional pattern of children in Jharkhand. The state of Jharkhand has remained under the scanner since its inception in 2000, the earlier part of Bihar, for reasons like poor governance, high poverty levels, high mortality rates, low income, etc.
The National Family Health Survey report indicates Jharkhand is one amongst the other EAG states which has high infant mortality rates and undernutrition rates. Despite the vast prevalence of under-nutrition in the state, the literature on the factors and determinates of under-nutrition is rather scant. Therefore, the present study is an attempt to understand the prevalence of malnutrition across age.
Jharkhand is among the top five states with malnourished – including stunted, wasted, and underweight – children, according to an India Spend analysis of data from the ministry of health and family welfare's National Family Health Survey, 2015-16 (NFHS-4). Jharkhand is known for its unique heritage and culture as well as natural resources. The state is largely inhabited by persons belonging to scheduled tribes and scheduled caste consisting of 40% of the total population. Above 80% of its population is rural and subsistence farming in their way of life. These tribal are desperately poor, backward, malnourished generally uneducated, and lead a hard and miserable life. As a result of poverty, the intake of various essential constituents of food is inadequate among tribal (DGHS 1996, NFHS-3, 2005).

Objectives
To find out the prevalence rate of malnutrition in 7-9 years old school going children

Research Methodology
The study was carried out between 2018-2019 through personal interviews using a pre-tested schedule. The interview schedule includes a General Profile of children and Anthropometric measurements which includes height and weight of children. Each section of the schedule was asked from children. Anthropometric measurements were taken for the school going children between the 7-9 years of the age.

Area of Study
The present study was conducted at two blocks that is Bhandra and Kairo in the Lohardaga district of Jharkhand

Age of the Children
The age of the children under study was 7-9 years.

Sample Size and Method
The total sample consisted of 200 school going children of the rural areas of Jharkhand. All children were selected by systematic random sampling.

Research Design
1. Construction of interview schedule for the collection of information
2. Selection of sample
3. Collection of data
4. Statistical analysis of the data

Data were entered into SPSS and analysed. Two Indices were taken for measurement of nutritional status i.e. height for age (Stunted) and weight for age (wasted), concerning NCHS standards of growth and development. The data was then compared and correlated with the NCHS (National Centre for Health Statistics) Standards and the standards given by ICMR (Indian Council of Medical Research). Anthropometric measurements were taken including height (cm.) and weight (kg.) of all the 200 respondents.
The data was collected by interviewing the children. Weight was measured using a weighing scale and height was recorded nearest to 10 cms and recorded as per the standard procedure.

Degree of Malnutrition
Water low's classification is used to know the degree of malnutrition in school going children 7-9 years. Because it is based on weight and height retardation. The formula is given below:

Weight/height (%) =weight of the child/weight of a normal child of same height *100
Height/age (%) = height of the child/height of a normal child of same age *100

Nutrition status	(% of height/age)	(% of weight/height)
Normal	> 95	> 90
Mildly impaired	87.5 – 95	80 – 90
Moderately impaired	80 – 87.5	70 – 80
Severely impaired	< 80	< 70

Srilakshmi (2007)

Result and Discussion
This table describes the distribution of respondents according to their age group.

Table 1: Age of the respondents

Sl. N.	Age (In years)	Total no of Girls	Percentage of girls	Total no of Boys	Percentage of boys	Total no of Children	Percentage of Total
	7	50	42.74	28	33.73	78	39
2	8	52	44.44	37	44.58	89	44.5
3	9	15	12.82	18	21.69	33	16.5
	Total	117	100	83	100	200	100

From the table 1, it shows that the maximum respondents, 44.44 percent of girls and 44.58 percent of boys respondents belonged to 8 years of age group, minimum respondents, 12.82 percent of girls and 21.69 percent of boys belonged to 9 years of age group and 42.74 percent of girls and 33.73 percent of boys respondents were belonged to 7 years of age group.
This table describes the distribution of the respondents according to their class in which they studied.

Table 2: Class of respondents

Sl. N.	Class	Total no of girls	Percentage of girls	Total no of boys	Percentage of boys	Total no of children	Percentage of Total
1	1st	22	18.8	10	12.05	32	16
2	2nd	32	27.35	18	21.69	50	25
3	3rd	31	26.5	30	36.14	61	30.5
4	4th	25	21.37	22	26.51	47	23.5
5	5th	7	5.98	3	3.61	10	5
	Total	117	100	83	100	200	100

From the table 2, it shows that the maximum girl respondents 27.35 percent were from 2nd class followed by 26.50 percent from 3rd class, 21.37 from 4th class, 18.80 percent from 1st class and minimum girls respondents 5.98 percent from 5th class respectively, and maximum boys respondents, 36.14 percent were also from 3rd class followed by 26.51 percent from class 4th, 21.69 percent from class 2nd, 12.05 percent from 1st class and minimum boys 3.61 percent from 5th class respectively.

Table 3: Comparison of Mean Height (cm.) of girls and boys (7-9 years) with NCHS Standard

Age (years)	No of respondents	Mean ±SE	NCHS Standard	Differences	t calculated Value	t Table Value (5%level)	t table Value (1% level)
Girls							
7	50	114.03±0.75	123.5	-9.47	12.6267**	2	2.66
8	52	120.80±0.89	129.3	-8.5	9.5506**	2	2.66
9	15	122.23±1.41	135.2	-12.97	9.1986**	2.131	2.947
Boys							
7	28	116.83±0.98	124.4	-7.57	7.7245**	2.048	2.763
8	37	121.21±1.15	129.6	-8.39	7.2957**	2.021	2.704
9	18	122.23±1.41	135.2	-12.97	9.1986**	2.101	2.878

Table 3 describes the observed mean height (cm.) of girls (7-9 years) in comparison with the NCHS standard at the 50th percentile. The observed mean height of 7 to 9 years of girl's respondents was less than the NCHS standard values such as in 7 years of girl's respondents (114.03±0.75), 8 years of girl's respondents (120.80±0.89), and in 9 years of girl's respondents (122.23±1.41). Similarly,the observed mean height of 7 to 9 years of boy's respondents were less than the NCHS standard values such as in 7 years of boy respondents (116.83±0.98), 8 years of boy respondents (121.21±1.15) and in 9 years of boy respondents (122.23±1.41) respectively.

Since the calculated value of t is greater than the table value of t Therefore, it can be concluded from the above data that there was a significant more difference at 1 or 5 percent level of significance between observed height and standard height. The data were categorized into three age groups that are 7years, 8years, and 9years. The observed height is significantly less than the NCHS standard value in all age groups.

Table 4: Comparison of Mean Weight (kg.) of girls and boys (7-9 years) with NCHS Standard

Age (Years)	No of respondents	Mean ±SE	NCHS Standard	Differences	t calculated Value	t Table Value (5%level)	t Table Value (1% level)
Girls							
7	50	17.12±0.29	23.3	-6.18	21.3103**	2	2.66
8	52	19.77±0.39	26.6	-6.83	17.5128**	2	2.66
9	15	20.58±0.68	30.5	-9.92	14.5882**	2.131	2.947
Boys							
7	28	18.40±0.36	24	-5.6	15.5556**	2.048	2.763
8	37	20.07±0.44	26.7	-6.63	15.0682**	2.021	2.704
9	18	20.97±0.49	29.7	-8.73	17.8163**	2.101	2.878

Table 4 described that the observed mean weight (kg.) of girl school children in comparison with the NCHS standard at the 50th percentile. The observed mean weight of 7 to 9 years of girl respondents was less than the NCHS standard values such as in 7 years of girls respondents (17.12±0.29), 8 years of girls respondents (19.77±0.39), and in 9 years of girls respondents (20.58±0.68). Similarly, the observed mean weight of 7 to 9 years of boys respondents were less than the NCHS standard values such as in 7 years of boys respondents (18.40±0.36), 8 years of boys respondents (20.07±0.44) and in 9 years of boys respondents (20.97±0.49) respectively.

Since the calculated value of t is greater than the table value of t. Therefore, it can be concluded from the above data that there was a significantly more difference at 1 or 5 percent level of significance between observed weight and standard weight. The data were categorized into three age groups that are 7-year, 8 years, and 9 years. It was also observed that observed weight is significantly less than the NCHS standard value in all age groups.

Table 5: Distribution of children according to their Degree of Malnutrition based on stunting i.e. height for age

Sl. N.	Degree of Malnutrition (Stunting)	7 years N=78			8 years N=89			9 years N=33		
		Girls n=50 (%)	Boys n=28 (%)	Total N=78 (%)	Girls n=52 (%)	Boys n=37 (%)	Total n=89 (%)	Girls n=15 (%)	Boys n=18 (%)	Total n=33 (%)
1	Normal	11(22)	13(46.43)	24(30.77)	17(32.69)	15(40.54)	32(35.96)	2(13.33)	3(16.67)	5(15.15)
2	Mild	34(68)	13(46.43)	47(60.26)	28(53.85)	15(40.54)	43(48.31)	9(60)	12(66.67)	21(63.64)
3	Moderate	5(10)	2(7.14)	7(8.97)	7(13.46)	7(18.92)	14(15.73)	4(26.67)	3(16.67)	7(21.21)
4	Severe	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)

Table 5 shows that the maximum girl respondents (68%) and boy respondents (46.43%) of 7 years of age group had mild malnutrition and the minimum girls respondents (10%) and boys respondents (7.14%) of this age group had moderate malnutrition whereas only 22% of girls and 46.43% of boys of 7 years of age group were normal. No girl and boy respondents were suffering from severe malnutrition.

The above table also shows that in the age group of 8 years of the school-going children maximum girl respondents (53.85%) and (40.54%) had mild malnutrition and boy respondents (40.54) and 32.69 percent of girl respondents were normal and minimum girl respondents (13.46) and boy respondents (18.92) had moderate malnutrition. No girl and boy respondents were having severe malnutrition in this age group.

From the above table, it also shows that maximum girl respondents (60.00%) and boy respondents (66.67%) belonging to 9 years of age had mild malnutrition, 26.67% of girls and 16.67% of boys had moderate malnutrition, and minimum girls respondents (13.33%) and boys respondents (16.67%) were normal. No girl and boy respondents had severe malnutrition of the 9 years of age group.

Table 6: Distribution of respondents according to their Degree of Malnutrition based on wasting (weight for height)

Sl. N.	Degree of Malnutrition (Wasting)	7 years N=78			8 years N=89			9 years N=33		
		Girls n=50 (%)	Boys n=28 (%)	Total n=78 (%)	Girls n=52 (%)	Boys n=37 (%)	Total n=89 (%)	Girls n=15 (%)	Boys n=18 (%)	Total n=33 (%)
1	Normal	3(6)	1(3.57)	4(5.13)	5(9.62)	3(8.11)	8(8.99)	0(0)	0(0)	0(0)
2	Mild	5(10)	6(21.43)	11(14.1)	11(21.15)	9(24.32)	20(22.47)	1(6.67)	1(5.56)	2(6.06)
3	Moderate	24(48)	17(60.71)	41(52.56)	20(38.46)	14(37.84)	34(38.2)	5(33.33)	10(55.56)	15(45.45)
4	Severe	18(36)	4(14.29)	22(28.21)	16(30.77)	11(29.73)	27(30.34)	9(60)	7(38.89)	16(48.48)

From the table 6, it shows that the maximum girl respondents (48.00%) and boys respondents (60.71%) belonging to the 7 years of age came into the category of moderate malnutrition and in this age group, minimum girls respondents (6.00%) and minimum boys respondents (3.57%) were Normal. 36% of girls and 14.29 percent of boys came in the category of severe malnutrition whereas 10 percent of girl respondents and 21.43 percent of boy respondents had mild malnutrition in terms of wasting.

From the table, it also shows that in the age group of 8 years of children maximum girl respondents (38.46%) and boy respondents (37.84%) also had moderate malnutrition. The minimum girl respondents (9.62%) and minimum boy respondents (8.11%) came into the normal category. 30.77 percent of girls and 29.73 percent of boy respondents had severe malnutrition whereas 21.15 percent of girl respondents and 24.32 percent of boy respondents came in the category of mild malnutrition.

The maximum girl respondents (60.00%) belonging to 9 years of age had severe malnutrition and boy respondents (55.56%) belonging to 9 years of age had moderate malnutrition and minimum girl respondents (6.67%) and boy respondents (5.56%) had mild malnutrition. No respondents came under the normal category in this age group.

Table 7: Distribution of Stunting (N=200)

Stunting	7 years	8 years	9 years	Total	Percentage of Total
Normal	24	32	5	61	30.5
Mild	47	43	21	111	55.5
Moderate	7	14	7	28	14
Severe	0	0	0	0	0

Table 8: Distribution of Wasting (N=200)

Wasting	7 years	8 years	9 years	Total	Percentage of Total
Normal	4	8	0	12	6
Mild	11	20	2	33	16.5
Moderate	41	34	15	90	45
Severe	22	27	16	65	32.5

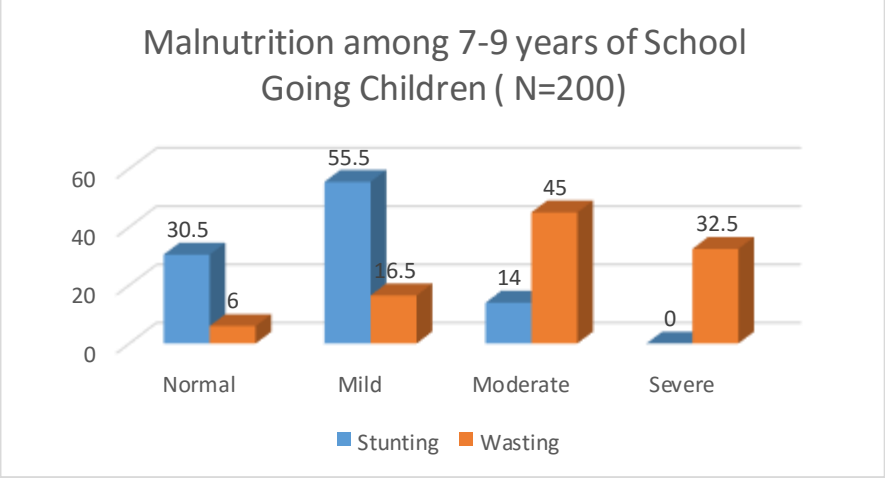

Fig 1: Distribution of Malnutrition (Stunting and Wasting) among 7-9 years of School Going Children

From the Table 7&8 and Figure 1 Data indicate that the maximum respondents were suffering from Mild and Moderate Malnutrition in terms of stunting and maximum respondents were suffering from Moderate and Severe Malnutrition in terms of wasting as per Waterlow's classification.

Conclusion

- According to Waterlow's classification (height /age) results indicate based on height for age (stunting) that the maximum of 200 respondents, 55.5 percent of boys and girls had mild malnutrition, 30.5 percent were normal, and 14 percent had moderate malnutrition.
- Based on weight for height (wasting) that the maximum of 200 respondents, 45 percent of boys and girls had moderate malnutrition, 32.5 percent had severe malnutrition, 16.5 percent had mild malnutrition, and 6 percent were normal.

Suggestion

- Health, Nutrition, and personal hygiene education could also be made as a part of the school curriculum apart from the regular educational activities in the School. A comprehensive school health programme must be implemented in the schools.

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