

Anthropometric Profile of the Children Admitted to Tertiary Healthcare Centre and its Association with Maternal Education and Occupation: A Retrospective Observational Study

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ABSTRACT

Introduction: In the recently published National Family Health Survey (NFHS)-5 data, Anand district's performance was not promising in terms of nutrition of mother and child; and being the only tertiary care teaching hospital in the district, there is a need to generate the study data.

Aim: To evaluate the anthropometric profile of paediatric patients across different age groups at a Tertiary Care Centre, and to study its association with maternal education and occupation. Also, to compare the anthropometry indicators of NFHS-5 of Anand district with anthropometry of hospitalised children.

Materials and Methods: The present retrospective observational study was conducted at the Department of Paediatrics of Pramukhswami Medical College and Shree Krishna Hospital in Anand district in Gujarat state between January 2023 to December 2023. A total of 1099 patients admitted under the Paediatric Department between the age groups of one month to 18 years in the Paediatric Ward and Paediatric Intensive Care Unit were included. All pertinent baseline details and their anthropometry were measured and plotted on World Health Organisation (WHO) and Indian Academy of Paediatrics (IAP)

growth charts. Expected age values were calculated, and Z-scores were determined for classification. Mothers were also surveyed about their education and employment status. The Chi-square test was used to study the association between maternal education and occupation, and the Z-test for proportion compared results with NFHS 5 data.

Results: A total of 1099 paediatric patients were admitted during the study period. The median (Q1,Q3) age of study cohort was 67(21,137) months and males were 651(59.24%). Among all patients, 70% were stunted and 85% were underweight. Data for children under 5 significantly differed from NFHS-5 data ($p<0.001$), with higher rates of stunting (69.5% vs. 38.4%), underweight (84.8% vs. 46.6%), wasting (77.8% vs. 28.6%), and severe wasting (29.6% vs.10.9%). Maternal education and occupation were linked to child growth, with stunting associated with maternal education and underweight linked to maternal occupation in older children.

Conclusion: The study revealed higher prevalence rates of stunting, wasting, and underweight among indoor paediatric patients compared to NFHS-5 data for the Anand district.

Keywords: Malnutrition, Maternal health, Prevalence, Stunting, Wasting

INTRODUCTION

Anthropometry, the measurement of human body dimensions, plays a crucial role in the assessment of the health and nutritional status of children. According to the World Health Organisation (WHO) in 2022, globally, an estimated 149 million children under 5 were stunted, 45 million wasted, and 37 million were overweight or obese [1]. In India, as per the NFHS-5, the prevalence of stunting and wasting is 35.5% and 19.3%, respectively, among children under 5 years. Recent estimates suggest that India is home to approximately one-third of the world's malnourished children, with significant rates of stunting, wasting, and underweight prevalence [2].

Anthropometric measurements such as height, weight, Mid-upper Arm Circumference (MUAC), and head circumference provide critical data for evaluating a child's nutritional status and growth trajectory. These measurements, when compared to standardised growth charts and reference data, enable healthcare professionals to identify deviations from normal growth patterns and detect potential health issues earlier [3]. The WHO has established global growth standards based on data from healthy, breastfed infants and young children from diverse ethnic backgrounds. These standards serve as a benchmark for assessing child growth and nutritional status worldwide, allowing for consistent evaluation and comparison across different populations [4]. In India, the use of both WHO standards

and country-specific growth charts developed by the IAP provides a comprehensive approach to growth monitoring and nutritional assessment [5]. Anthropometry not only aids in individual patient care but also contributes significantly to public health surveillance and policy formulation. Population-level anthropometric data help identify trends in child growth and nutrition, inform resource allocation, and evaluate the effectiveness of nutrition interventions and health programs [6].

In recent years, there has been growing recognition of the complex interplay between various factors influencing child growth and nutrition. Maternal education and occupation have emerged as key determinants of child health outcomes, profoundly affecting nutritional status, growth, and overall well-being [7]. Understanding these relationships is essential for developing comprehensive approaches to improve child health and nutrition. As per the literature, mothers with higher education tend to adopt healthier practices, like initiating breastfeeding soon after birth and exclusively breastfeeding [7]. NFHS-4 data indicate that these mothers are more inclined to initiate breastfeeding within an hour of birth and exclusively breastfeed for the recommended six months [2]. A mother's occupation reflects the household's socioeconomic status and impacts access to crucial resources for child health [1-3]. Children whose mothers are employed in formal jobs typically have

improved access to healthcare, nutrition, and education compared to those with mothers in informal or unstable employment [8]. NFHS-4 findings reveal discrepancies in child nutritional status depending on maternal occupation [2]. Children whose mothers are formally employed tend to have lower rates of stunting, wasting, and underweight prevalence compared to those with mothers in informal or unskilled occupations [9]. Working mothers may find it challenging to offer optimal care, potentially affecting child nutrition, growth, and development.

Hence, the present study was undertaken to determine the prevalence of malnutrition at the Tertiary Care Centre, to compare data from NFHS 5 in the Anand district, Gujarat, India, and to determine if any relationship exists between maternal education and employment with anthropometric data.

MATERIALS AND METHODS

The present retrospective observational study was conducted at the Department of Paediatrics of Pramukhswami Medical College and Shree Krishna Hospital of Anand District in Gujarat, India. Study included records of all cases after the approval from the Ethical Committee (IEC Approval no- (IEC/BU/141/Faculty/12/157/2022 dated 28th November 2022). The case records included from 1st January 2023 to 31st December 2023 with an additional three months of data management, data cleaning, and analysis completed by April 2024.

Inclusion criteria: All the patients admitted under the Paediatric Department in the Paediatric Ward and Paediatric Intensive Care unit between one month to 18 years, irrespective of their gender, co-morbid condition, or severity of illness was included.

Exclusion criteria: Missing complete record or information for any reason was excluded.

Sample size: All the patient admitted to the paediatric intensive care unit and paediatric ward within the study duration were enrolled in the study.

Study and data collection tools: Case record files and/or Solace record (Solace means Indigenous Electronic Health record System of Shree Krishna Hospital) were the main source of information and collected retrospectively. The anthropometric parameters of these patients were measured and compared to the standard WHO growth charts for age under 5 years and IAP growth charts for age 5-18 years [4,5]. A comparison was made with data from NHFS-5 for the Anand district [2]. Mother's education and occupation were compared to the anthropometric parameters of each patient according to age category. The operational definitions and their appropriate cut-off values are as per [Table/Fig-1] [10]. Mother was described as educated if gone to school and was able to read and write, whereas uneducated means she was not able to read. An

Age group	Interpretation of anthropometry parameters	Cut-offs of anthropometry parameters
Under-5 years (Based on height for age or weight for height)	Mild Stunting	< -1 SD to -2 SD
	Moderate Stunting	< -2 SD to -3 SD
	Severe Stunting	< -3 SD
	Mild Wasted	<-1 SD to -2 SD
	Moderate Wasted	<-2 SD to -3 SD
	Severe Wasted	< -3 SD
5 years to 18 years (Based on weight for age or body mass index)	Mild Underweight	<-1 SD to -2 SD
	Moderate Underweight	<-2 SD to -3 SD
	Severe Underweight	< -3 SD
	Obesity	> 2 SD
	Overweight	> 1 SD to 2 SD
	Thinness	<-2 SD to -3 SD
	Severe thinness	< -3 SD

[Table/Fig-1]: Operational definition of anthropometry parameters [10].

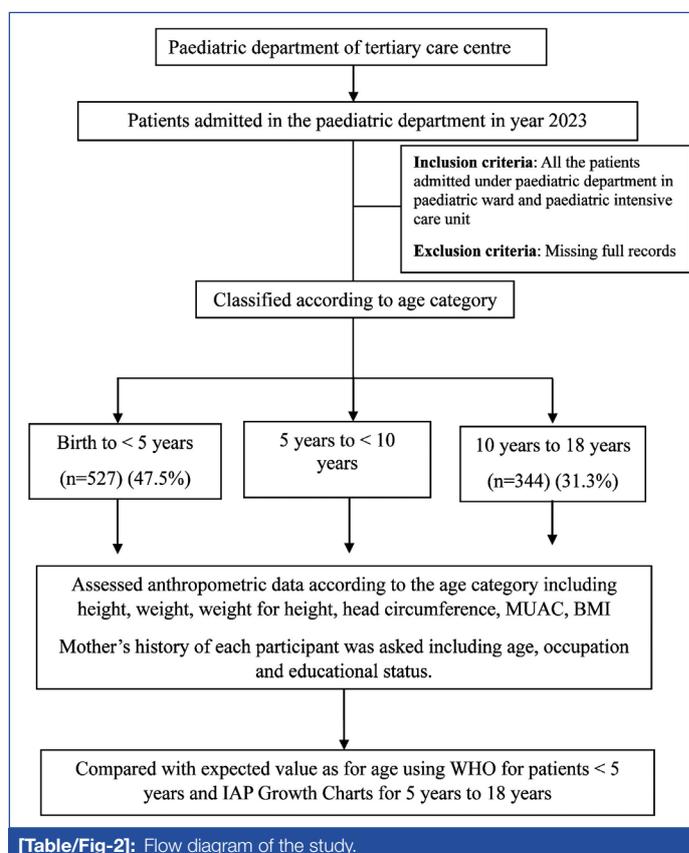
employed mother is described as a working mother outside the home, irrespective of the nature of work, whereas housewives are taken as unemployed mothers.

STATISTICAL ANALYSIS

As per the predesigned performa, all demographic details and pertinent history and examination with special emphasis on anthropometry were filled & entered into a Microsoft Excel sheet and then analysed by using STATA 14.2. The Chi-square and Fisher's-exact test were performed to determine the relationship between categorical variables (maternal education and maternal occupation). The Z-test for proportions is used to compare the results with the NFHS-5 data.

RESULTS

The present study included a total of 1099 paediatric patients (1 month to 18 years). [Table/Fig-2] shows the flow chart of study participants. It shows that there is nearly equal distribution of patients between 5-18 years of age and under-5 age.



[Table/Fig-2]: Flow diagram of the study.

The baseline details of age, gender, mother's education and occupation, and anthropometry status are shown in [Table/Fig-3]. So, the current study had male predominance (59.26%, n=651/1099) and nearly half of patients were infants and young children (47.95%, n=527/1099). The median (Q1, Q3) age of study cohort was 67 (21, 137) months and males were 651 (59.24%).

Age-group-wise distribution of important anthropometry parameters is shown in detail in [Table/Fig-4]. Out of the total 1099 paediatric patients, nearly one-third were normal but rest all have some degree of stunting where almost one-fourth had severe stunting. The weight for age is a combined indicator for both acute and chronic malnutrition. Out of a total of 1099 paediatric patients, only 167 (15.2%) were normal, while the majority of them were underweight. Almost 410 (77.8%) patients out of a total of 527 in the under-5 category had wasting of any severity. Among all patients, 70% were stunted and 85% were underweight.

The anthropometric parameters were then compared to maternal education and occupation using Chi-square testing [Table/Fig-5,6].

Category	Subcategory	Total n=1099 (%)
Gender	Male	651(59.24)
	Female	448(40.76)
Age-group	1 month to 5 years	527 (47.95)
	>5 years to 10 years	228 (20.75)
	>10 years to 18 years	344 (31.30)
Maternal education	Educated*	494 (44.95)
	Uneducated	605 (55.05)
Maternal occupation**	Employed	396 (37.58)
	Unemployed	652 (62.42)
Anthropometry status	Height for age (stunted)	764 (69.5)
	Weight for age (underweight)	932(84.8)
	Weight for height (wasted)	410(37.3)
	Weight for height (severely wasted)	156(14.2)

[Table/Fig-3]: Baseline details of study participants.
*Illiterate plus primary school only, **Missing data in 51 records

there was no association between anthropometric parameters and maternal education or maternal occupation.

[Table/Fig-7] shows a comparison of the present study data with NFHS-5 data of Anand district and Gujarat state data. It shows that 764/1099(69.5%) were stunted as per height for age, 932/1099(84.8%) were underweight as per weight for age, 410/527(77.8%) wasted and 156/527 (29.6%) severely wasted as per weight for height criteria in appropriate age -categories in present study which were significantly higher than Anand district and Gujarat state NFHS-5.

DISCUSSION

This study aimed to assess the anthropometric profile of paediatric patients admitted to a Tertiary Care Centre and explore its relationship with maternal education and occupation. The findings reveal high prevalence rates of stunting, wasting, and underweight among the studied population, with significant associations observed between maternal factors and certain anthropometric parameters.

Anthropometry parameter	Interpretation	Age group			Total n=1099 (%)
		Under-5 years n=527 (%)	5-10 years n=228 (%)	>10-18 years n=344 (%)	
Height for age	Normal	128 (24.3)	89 (39)	118 (34.3)	335 (30.4)
	Mild stunting	13 (2.5)	55 (24.1)	81 (23.6)	149 (13.6)
	Moderate stunting	188 (35.6)	64 (28.1)	92 (26.7)	344 (31.3)
	Severe stunting	198 (37.6)	20 (8.8)	53 (15.4)	271 (24.7)
Weight for age	Normal	70 (13.3)	28 (12.3)	69 (20.1)	167 (15.2)
	Mild underweight	5 (0.9)	50 (21.9)	62 (18)	117 (10.6)
	Moderate underweight	163 (31)	91 (39.9)	136 (39.5)	390 (35.5)
	Severe Underweight	289 (54.8)	59 (25.9)	77 (22.4)	425 (38.7)
Weight for height	Normal	117 (22.2)	-	-	-
	Mild wasting	65 (12.3)	-	-	-
	Moderate wasting	189 (35.9)	-	-	-
	Severe wasting	156 (29.6)	-	-	-

[Table/Fig-4]: Age-group-wise arthrometry parameters of study participants.

Age category	Anthropometry status	Educated n=494 (%)	Uneducated* n=605 (%)	Total, n=1099 (%)	p-value**
Stunted	1 month to 5 years	157/221 (71.04)	242/306 (79.08)	399/527 (75.71)	0.034
	>5 years to 10 years	73/113 (64.60)	70/115 (60.87)	143/228 (62.72)	0.560
	>10 years to 18 years	97/160 (60.62)	125/184 (67.93)	222/344 (64.53)	0.158
Wasting/ Underweight	1 month to 5 years	189/221 (85.52)	268 /306 (87.58)	457/527 (86.72)	0.491
	>5 years to 10 years	96/113 (84.96)	104/115 (90.43)	200/228 (87.72)	0.208
	>10 years to 18 years	131/160 (81.88)	144/184 (78.26)	275 /344 (79.94)	0.404

[Table/Fig-5]: Association of stunting and wasting/underweight with maternal education.
*Illiterate plus primary school only, **p-value derived by the Chi-square test

Age category	Anthropometry Status	Employed n=396 (%)	Unemployed n=652 (%)	Total* n=1048 (%)	p-value**
Stunted	1 month to 5 years	154/196 (78.57)	245/331 (74.02)	399/527 (75.71)	0.211
	>5 years to 10 years	60/90 (66.67)	83/138 (60.14)	143/228 (62.72)	0.320
	>10 years to 18 years	66/110 (60.00)	156/183 (66.67)	222 /293 (64.53)	0.228
Wasting/ Underweight	1 month to 5 years	171/196 (87.25)	285/331 (86.10)	456/527 (86.52)	0.504
	>5 years to 10 years	82/90 (91.11)	118/138 (85.51)	200/228 (87.72)	0.208
	>10 years to 18 years	80/110 (72.73)	144/183 (78.69)	224 /293 (76.45)	0.022

[Table/Fig-6]: Association of stunting and wasting/underweight with maternal occupation.
*Missing data in 51 records, **p-value derived by Chi-square test

Age category from one month to five years of age showed that children of uneducated mothers were more stunted than those of educated mothers. There is statistical significance between mothers' education and height for age ($p=0.034$). Similarly, in weight-for-age for patients between 10-18 years, it was shown that children of unemployed mothers were more underweight as compared to employed mothers ($p=0.022$). In the rest of the age category,

The present study found alarmingly high rates of malnutrition among the paediatric patients admitted to the Tertiary Care Centre. Overall, 70% of children were stunted, 85% were underweight, and 78% of children under 5 years were wasted. These rates are substantially higher than those reported in the NFHS-5 data for the Anand district, which showed stunting at 38.4%, underweight at 46.6%, and wasting at 28.6% for children under 5 years. This

Anthropometry status	Shree Krishna Hospital, Karamsad n=(%)	Anand District (as per NFHS 5) %	Gujarat State (as per NFHS 5) %
Height for age (stunted)	764/1099 (69.5)	38.4	39
Weight for age (underweight)	932/1099 (84.8)	46.6	39.7
Weight for height (wasted)	410/527 (77.8)	28.6	25.1
Weight for height (severely wasted)	156/527 (29.6)	10.9	10.6

[Table/Fig-7]: Comparison of the present study's anthropometric data with district and state data.

large gap between the present study findings and the NFHS-5 data can be attributed to several factors: First and foremost, the reason is selection bias, as the present study was conducted in a Tertiary Care Hospital, where more severe cases are likely to be admitted, potentially overestimating the prevalence of malnutrition compared to community-based surveys. Another reason could be socioeconomic factors because this tertiary care trust hospital serves the population that may have lower socioeconomic status, contributing to higher rates of malnutrition. Also, better health-seeking behaviours in families usually do not require admissions, as most of the issues are taken care of by the outdoor services in the region. The present study was conducted in a referral centre, so this significant deviation.

The present study was compared with other studies conducted in various parts of India, and the comparison data are as follows. Duwarah S et al., conducted a study in a Tertiary Care Hospital in Northeast India, finding prevalence rates of 19.7% for underweight, 35.5% for stunting, and 8.5% for wasting among children under five [11]. These rates were lower than those observed in the present study, which may be attributed to regional differences and varying socioeconomic factors. Another study from West Bengal investigated adolescent nutritional status in rural West Bengal and reported stunting in 54% of adolescents, and 49% were thin [12]. They found significant associations between lower social classes and increased risk of stunting and thinness. The present study similarly identified high rates of stunting and underweight across different age groups. A study from South India, Selvaraj V et al., found prevalence rates of 6% for obesity, 10.9% for overweight, 13% for thinness, 5% for severe thinness, and 19.8% for stunting among school children aged 9-17 years [13]. They also noted significant associations between mothers' education, occupation, and socioeconomic status with both overnutrition and undernutrition. The present study found comparable rates of overweight and obesity in the 5-18 year age group, but higher rates of undernutrition. A study from north India examined anthropometric measures among children under-5 and reported prevalence rates of 9.2% for underweight, 28.6% for stunting, and 6.1% for wasting [14]. They found significant associations between various maternal factors and child nutritional status. The present study observed substantially higher rates of malnutrition, which may be due to the Tertiary Care Hospital setting and potential selection bias.

The present study found that maternal education is associated and it was for height-for-age in children under 5. Children of illiterate mothers were more likely to be stunted compared to those whose mothers were literate. Maternal occupation also impacts on child's anthropometry. The present study found a significant association between maternal occupation and weight-for-age in children aged 10-18 years. Children of unemployed mothers were more likely to be underweight compared to those whose mothers were employed. These findings are consistent with the literature. A study by Sudha G et al., conducted in the Chittoor district of Andhra Pradesh indicated a higher incidence of low birth weight among mothers who were illiterate (25%), while maternal occupation did not exhibit a significant

correlation with low birth weight. Compared to women with higher levels of education, illiterate mothers were found to have a 2.6 times greater likelihood of delivering babies with low birth weight [15]. Thus, it demonstrated the positive impact of maternal education on child health outcomes. Research by Philip RR et al., showed that parents' lower educational attainment was significantly linked to undernutrition in preschool tribal children [16]. Das NK et al., found that mothers' education was inversely related to underweight, stunting, and wasting in children under five [17]. Studies conducted elsewhere have also reported a similar association between mothers' education and the nutritional status of children [18-20].

One comparative study examining the nutritional status of children (aged 3-5 years) from employed and unemployed mothers in selected areas of Mangalore, conducted by Shrestha P et al., it was found that overnutrition was more prevalent among children of employed mothers, whereas undernutrition was more prevalent among children of unemployed mothers [21]. In this thesis by Shrestha P. underscores the importance of educating mothers about the impacts of both undernutrition and overnutrition. In employed mothers, educational status significantly affected height-for-age and weight-for-age ($p=0.019$ and $p=0.015$, respectively), while in unemployed mothers, maternal age had a significant impact on height-for-age ($p=0.013$). Additionally, birth weight in the unemployed group was significantly linked to weight-for-age ($p=0.006$) and weight-for-height ($p=0.009$). However, demographic variables such as religion, family type, duration of maternal employment, and child gender did not show significant associations with children's nutritional status among both employed and unemployed mothers [21]. Olatidoye OP et al., conducted a study on maternal employment on preschoolers' nutritional status in low-income households in Oyo State, Nigeria. They analysed anthropometric data from 702 preschoolers, highlighting maternal education and working hours as influential factors. Maternal time spent with children correlated significantly with employment status. Regarding weight-for-age, 25.8% experienced mild Protein-Energy Malnutrition (PEM), 18.1% were moderately malnourished, and 10.8% were severely malnourished. Using height-for-age parameters, malnutrition levels were 39.2%, 22.8%, and 12.8% for mild, moderate, and severe cases, respectively. Mild PEM wasting was observed in 26.3% of cases, with moderate and severe cases at 14.6% and 8.6%, respectively [22]. This finding adds to the complex body of evidence regarding the impact of maternal employment on child nutritional status.

Limitation(s)

A major limitation of the present study was the hospital indoor setting where the sickest of patients get admitted, and so a quite high proportion of poor parameters. So, there is lack of generalisability and it cannot be compared directly with the community data of NFHS. As the study was retrospective, observation, causality was not established. Also, important confounders were not assessed comprehensively, especially food habits.

CONCLUSION(S)

The study revealed high prevalence rates of stunting, wasting, and underweight among paediatric patients admitted to a Tertiary Care Centre. The rates were significantly higher than those reported in the NFHS-5 data for the Anand district. Maternal education was found to be associated with height-for-age in children under 5 years, while maternal occupation showed a relationship with weight-for-age in children aged 10-18 years. The findings underscore the complex interplay between maternal factors and child nutritional status. There is a need for targeted interventions in the community, and a public-private partnership is recommended. Future research should focus on longitudinal studies to better understand the causal relationships between maternal factors and child anthropometry, as well as on developing effective strategies to address malnutrition in vulnerable populations.

REFERENCES

- [1] World Health Organisation. Levels and trends in child malnutrition. Child malnutrition: UNICEF/WHO/World Bank Group Joint Child Malnutrition Estimates: Key findings of the 2023 edition. World Health Organization; 2023 May 24.
- [2] Bhatia N, Rathi K, Arora C, Choedon T, Rajurkar P, Thakur R, et al. Analysis of key nutrition indicators based on National Family Health Survey, NFHS 4 (2015-16) and NFHS 5 (2019-2021).
- [3] India State-Level Disease Burden Initiative CGF Collaborators. Mapping of variations in child stunting, wasting and underweight within the states of India: The Global Burden of Disease Study 2000–2017. *EClinicalMedicine*. 2020;22:100317.
- [4] De Onis M, Blossner M. WHO global database on child growth and malnutrition. Geneva: World Health Organization; 1997.
- [5] Khadilkar V, Yadav S, Agrawal KK, Tamboli S, Banerjee M, Cherian A, et al. Revised IAP growth charts for height, weight and body mass index for 5-to 18-year-old Indian children. *Indian Pediatrics*. 2015;52:47-55.
- [6] Gupta A. Biochemical Parameters and the Nutritional Status of Children: Novel Tools for Assessment. Boca Raton: CRC Press; 2020.
- [7] Valappil HC, Jayalakshmi R, Sewor C. Intersectional inequalities in exclusive breastfeeding practices in India: Analysis of national family health survey-4. *International Breastfeeding Journal*. 2023;18(1):44.
- [8] Chowdhury AR, Surie A, Bhan G. Breastfeeding knowledge and practices of working mothers in the informal economy in New Delhi: A formative study to explore new intervention pathways towards improved maternal and child health outcomes. *Social Science & Medicine*. 2021;281:114070.
- [9] Oddo VM, Mueller NT, Pollack KM, Surkan PJ, Bleich SN, Jones-Smith JC. Maternal employment and childhood overweight in low-and middle-income countries. *Public Health Nutrition*. 2017;20(14):2523-36.
- [10] De Onis M. World Health Organization Reference Curves. The ECOG's eBook on Child and Adolescent Obesity. 2015:19.
- [11] Duwarah S, Bisai S, Barman H. Prevalence of undernutrition among preschool children of Garo hills, Meghalaya, India. *Indian J Pediatr*. 2015;82(5):445-48.
- [12] Pal A, Pari AK, Sinha A, Dhara PC. Prevalence of undernutrition and associated factors: A cross-sectional study among rural adolescents in West Bengal, India. *Int J Pediatr Adolesc Med*. 2017;4(1):09-18.
- [13] Selvaraj V, Sangareddi S, Velmurugan L, Muniyappan U, Anitha FS. Nutritional status of adolescent school children in a semi-urban area based on anthropometry. *Int J Contemp Pediatr*. 2016;3(2):468-72.
- [14] Singh JP, Gupta SB, Shrotriya VP, Singh PN. Study of nutritional status among under five children attending outpatient department at a primary care rural hospital, Bareilly (UP). *Sch J App Med Sci*. 2013;1(6):769-73.
- [15] Sudha G, Reddy TM, Narasimhulu S, Reddy KK, Reddy KS. Prevalence and correlates of low birth weight in Chittoor District of Andhra Pradesh, India. *Obstet Gynecol Int J*. 2017;7(1):194-98.
- [16] Philip RR, Vijayakumar K, Indu PS, Shrinivasa BM, Sreelal TP, Balaji J. Prevalence of undernutrition among tribal preschool children in Wayanad district of Kerala. *International Journal of Advanced Medical and Health Research*. 2015;2(1):33-38.
- [17] Das NK, Barbhuiya AF, Sarma R. Nutritional status of the rabha tribal children of Udalguri district of Assam, India. *Eur J Mol Clin Med*. 2020;7:4794-802.
- [18] Meshram II, Arlappa N, Balakrishna N, Rao KM, Laxmaiah A, Brahmam GN. Trends in the prevalence of undernutrition, nutrient and food intake and predictors of undernutrition among under five-year tribal children in India. *Asia Pacific Journal of Clinical Nutrition*. 2012;21(4):568-76.
- [19] Yasmin G, Kustiyah L, Dwiriani CM. Risk factors of stunting among school-aged children from eight provinces in Indonesia. *Pak. J. Nutr*. 2014;13(10):557-66.
- [20] Senbanjo IO, Oshikoya KA, Odusanya OO, Njoknma OF. Prevalence of and risk factors for stunting among school children and adolescents in Abeokuta, Southwest Nigeria. *Journal of Health, Population, and Nutrition*. 2011;29(4):364.
- [21] Shrestha P. A comparative study on nutritional status among children (3-5 years) of employed and unemployed mothers in selected areas at Mangalore. Doctoral dissertation submitted at Rajiv Gandhi University of Health Sciences, Bangalore. 2014.
- [22] Olatidoye OP. Effect of maternal employment on nutritional status of pre-school children from low-income households area of Oyo State. *Electronic Journal of Environmental, Agricultural and Food Chemistry (EJEAFCh)*. 2011;10(7):2574-80.

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