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Original Research Article

SOCIO-DEMOGRAPHIC PROFILE AND PREVALENCE OF MALNUTRITION AMONG UNDER-FIVE YEARS CHILDREN IN RURAL JALAUN, UTTAR PRADESH: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: In India, under-five child malnutrition is still a serious public health issue, particularly in rural areas where there is a high prevalence of poverty, poor dietary habits, and insufficient health facilities. The aim of the current study was to determine the prevalence of malnutrition and sociodemographic profile of study subjects in rural District Jalaun, Uttar Pradesh.

Materials and Methods: In a community-based cross-sectional study that took place between June 2023 and November 2024, 370 children between the ages of 0 and 5 were chosen using multistage random sampling. Anthropometric measurements in accordance with WHO guidelines and a pre-tested semi-structured questionnaire were used to gather data. WHO Z-scores and the Composite Index of Anthropometric Failure (CIAF) were used to evaluate nutritional status.

Results: The findings showed that 40.54% of the 370 children were stunted, 34.05% were underweight, 17.57% were wasted, and 0.54% were overweight. 54.3% of children experienced one or more types of malnutrition, according to the CIAF. The most prevalent types were stunting alone (16.8%) and stunting plus underweight (15.4%). According to a sociodemographic analysis, the majority of children (47.84%) came from joint families, had a low socioeconomic status (52.16% in the upper lower class), and 38.1% of their mothers were illiterate. The majority of maternal age at pregnancy (55.1%) were older than 24 years.

Conclusion: In rural Jalaun, malnutrition is still very common among children under five. In order to address the complex causes of childhood malnutrition, the results highlight the necessity of community-based nutritional interventions, maternal education, and enhanced socioeconomic support.

Keywords: Malnutrition, Underweight, Stunting, Wasting, Under-five children, Socio-demographic factors, Rural India

INTRODUCTION

Malnutrition remains a significant public health challenge, particularly in developing countries like India, where it affects millions of children under the age of five. Malnutrition encompasses both undernutrition and overnutrition, but undernutrition—manifesting as underweight, stunting, and wasting—continues to be the dominant concern in rural populations. According to the World Health Organization (WHO), underweight reflects both acute and chronic nutritional deficits, stunting indicates long-term growth failure due to persistent undernutrition, and wasting is a marker of acute malnutrition often linked to recent illnesses or inadequate food intake.[1]

India bears a significant portion of the worldwide burden of undernutrition in children. In India, 32.1% of children under five are underweight, 35.5% are stunted, and 19.3% are wasted, according to the National Family Health Survey (NFHS-5, 2019–2021). The most populated state in India, Uttar Pradesh, has even greater rates, especially for stunting (39.7%). Sadly, the frequency is higher in District Jalaun, where 19.5% of people are wasted, 45.1% are stunted, and 36.1% are underweight. These factors show how urgently localised study is needed to understand and resolve this persistent problem. [2,3]

Early childhood undernutrition raises the risk of morbidity and death and has a negative impact on growth and cognitive development.[4] Inadequate infant and young child feeding practices, including delayed initiation of complementary feeding and poor dietary diversity, are major contributors to childhood malnutrition.[5] Research conducted in India has demonstrated that low socioeconomic status and improper feeding practices have a major impact on the nutritional status of children under five.[6,7] In order to create focused interventions, it is essential to evaluate the prevalence and contributing factors of malnutrition in rural areas.

Socio-demographic factors such as parental education, family income, caste, and housing conditions significantly influence a child's nutritional status. Understanding the relationship between these variables and malnutrition is essential for developing targeted, evidence-based interventions.

This study aims to examine the socio-demographic profile of under-five children in rural areas of District Jalaun and estimate the prevalence of malnutrition in this study population.

Aims and Objectives

Aim: To assess the socio-demographic profile and prevalence of malnutrition among under-five years children in rural areas of District Jalaun, Uttar Pradesh.

Objectives:

1. To estimate the socio-demographic profile of under-five years children in the study area.
2. To estimate the prevalence of different forms of malnutrition (underweight, stunting, wasting, and overweight) using WHO criteria and the Composite Index of Anthropometric Failure (CIAF).

MATERIALS AND METHODS

Study Design and Setting: A community-based cross-sectional study was conducted in rural areas of District Jalaun, Uttar Pradesh, to assess the prevalence of malnutrition and socio-demographic factors among children under five years.

Study Population and Sampling: Children aged 0–5 years residing in the area for at least six months were included after obtaining parental consent.

Using the formula $N = (1.96)^2 PQ / L^2$ with confidence interval of 95%.[8]

where; P is the prevalence of underweight in under-five children (32.1% as per NFHS-5 India data)

- Q is 100 - P (67.9%)
- L is the absolute error (5%)

Applying the formula, the calculated sample size was 335.

Taking 10% non-response rate, the final sample size was set at 370 children.

A multi-stage simple random sampling technique was applied:

- One block (Kadaura) was selected randomly from nine blocks in district Jalaun.
- One village (Ata) was randomly selected from the block Kadaura.
- Households were chosen starting from a randomly identified point using a bottle-spin method, following a systematic left-turn approach until the sample size was met.

Data Collection

Data were collected using:

- Pre-tested Semi-structured Questionnaire: Covered socio-demographic profiles, maternal and child health, and dietary habits.
- Anthropometry: Weight, height/length, MUAC, head and chest circumference were measured using standard WHO techniques. [1,9]

Nutritional Assessment: The Composite Index of Anthropometric Failure (CIAF) was used to classify malnutrition:[10]

- Group A: No failure
- Group B: Wasting only
- Group C: Wasting and underweight
- Group D: Wasting, stunting, and underweight
- Group E: Stunting and underweight
- Group F: Stunting only
- Group Y: Underweight only

Additionally, WHO Z-score classifications were applied to determine malnutrition severity:

- Underweight: Weight-for-age Z-score < -2 SD
- Stunting: Height-for-age Z-score < -2 SD
- Wasting: Weight-for-height Z-score < -2 SD
- Overweight: Weight-for-height Z-score > +2 SD

Ethical Approval: Ethical clearance was obtained from the Institutional Ethics Committee, GMC Jalaun (Ref. No. 07/IEC/RMC/2023, dated 01/08/2023). Written informed consent was obtained from parents/guardians.

Data Analysis: Data were entered in MS Excel and analyzed using SPSS software. Descriptive statistics were used for baseline characteristics. A p-value <0.05 was considered statistically significant.[11]

RESULTS

A total of 370 children under five years of age were included in the study. The age distribution was evenly distributed, with the 37–48 months age group having the largest percentage (21.08%). The sample was composed of 48.11% females and 51.89% males.

Hindus made up the great majority of participants (97.03%). In terms of family structure, 17.03% of children were from three-generational families, 35.14% were from nuclear families, and 47.84% were from joint families. Families with more than five individuals made up more than half (54.86%). According to the Modified BG Prasad scale (2024).[12] which measures the socioeconomic status, 52.16% of the population were in the upper lower class and 36.22% were in the lower middle class. 38.1% mothers were illiterate. The maternal age at pregnancy was predominantly over 24 years (55.1%), followed by 42.9% in the 19–24 years group, and only 2% were below 19 years. [Table 1]

Table 1: Sociodemographic Profile of Study Subjects (N = 370)

Variable	Category	Frequency (n)	Percentage (%)
Age Group (months)	0–12	77	20.81
	13–24	64	17.29
	25–36	77	20.81
	37–48	78	21.08
	49–60	74	20.00
Sex	Male	192	51.89
	Female	178	48.11
Religion	Hindu	359	97.03
	Muslim	11	2.97
Type of Family	Joint	177	47.84
	Nuclear	130	35.14
	Three Generation	63	17.03
Family Size	≤5 members	167	45.14
	>5 members	203	54.86
Socioeconomic Class (Modified BG Prasad)	Upper middle (II)	32	8.65
	Lower middle (III)	134	36.22
	Upper lower (IV)	193	52.16
	Lower (V)	11	2.97
Mother's Education	Literate	229	61.90
	Illiterate	141	38.10
Maternal Age at Pregnancy (years)	<19	7	2.00
	19–24	159	42.90
	>24	204	55.10

Among the study population, the overall prevalence of stunting was the highest at 40.54%, followed by underweight at 34.05%, wasting at 17.57% and overweight 0.54%. [Table 2]

Table 2: Prevalence of Malnutrition Among Study Subjects (N = 370)

Type of Malnutrition	Number of Children Affected	Prevalence (%)
Underweight	126	34.05%
Wasting	65	17.57%
Stunting	150	40.54%
Overweight	2	0.54%

The Composite Index of Anthropometric Failure (CIAF) revealed that 54.3% of children suffered from one or more forms of malnutrition. Stunting alone was the most prevalent (16.8%), followed by combined underweight and stunting (15.4%), and the most severe combination of underweight, stunting, and wasting (8.4%). Only 45.7% of children showed no signs of anthropometric failure, indicating a high overall malnutrition burden in the study population. [Table 3]

Table 3: Combination of various forms of malnourishment group (Composite Index of Anthropometric Failure CIAF)

Category	Group Name	N (%)
A	No failure	169 (45.7%)
B	Wasting only	13 (3.5%)
C	Underweight + Wasting	21 (5.7%)
D	Underweight + Stunting + Wasting	31 (8.4%)
E	Underweight + Stunting	57 (15.4%)
F	Stunting only	62 (16.8%)
Y	Underweight only	17 (4.6%)
	CIAF	201 (54.3%)
	Total	370 (100.0%)

DISCUSSION

The sociodemographic characteristics and prevalence of malnutrition among children under five in rural area of Jalaun, Uttar Pradesh, were evaluated in this study. According to the Composite Index of Anthropometric Failure (CIAF), 54.3% of children had one or more types of anthropometric failure, and 40.54% of children were stunted, 34.05% underweight, and 17.57% wasted. These results showed a high prevalence of malnutrition.

Our study's stunting prevalence (40.54%) was greater than both the state average of 39.7% for Uttar Pradesh and the national average of 35.5% (NFHS-5,

2019–21).[2] This implies that chronic undernutrition is still a problem in rural Jalaun. A study by Gupta et al. (2019) conducted in rural Haryana reported stunting in 41.3% of children, which closely aligns with our findings, reinforcing the notion that chronic malnutrition remains across rural regions of India.[13] This study's underweight prevalence of 34.05% is similar to the 32.1% national average for the NFHS-5. In research carried out in rural Hyderabad, by Afreen et al. (2024) found that 33% of children under five were underweight.[14] These results suggest that long-term dietary deficiencies and socioeconomic disadvantage are linked to a persistent public health concern.

The wasting prevalence in the population we studied was 17.57%, which was somewhat lower than the national average (19.3%) and the state average (19.5%) as per NFHS-5. According to a study by Murakar S et al. (2020), 17.1% of children under five in rural Maharashtra and urban slums were wasted, suggesting that acute malnutrition trends are similar in different rural areas of India.[15] Wasting indicates the existence of continuous health or food difficulties in the population and is frequently linked to recent illnesses or insufficient food intake.

in our study the use of CIAF showed a 54.3% malnutrition burden, which is far greater than estimates based only on individual markers. Nandy et al. (2005), who developed the CIAF concept and showed that it more accurately represents the overall burden of malnutrition, especially in populations with multiple forms of anthropometric failure, also discovered this pattern.[10] Our finding that only 45.7% of children were free from any anthropometric failure underscores the need for comprehensive assessment tools and interventions.

According to sociodemographic patterns, the majority of children in our study were from low socioeconomic groups, were part of joint households (47.84%), family size more than 5 (54.86%) and had illiterate mothers (38.1%%). More than 40% of children under five suffer from undernutrition, according to Ishwarji MI et al. (2019), and this condition is strongly correlated with maternal illiteracy, socioeconomic status, and sanitation.[16]

When taken as a whole, these results show that poverty, family structure, maternal education, and living conditions are some of the larger sociodemographic characteristics that affect malnutrition in children under five. Despite numerous government initiatives like POSHAN Abhiyaan and ICDS, the prevalence of malnutrition in rural Jalaun continues to persists, highlighting the need for multi-sectoral, community-based, and locally focused interventions that tackle the underlying causes of undernutrition.

CONCLUSION

According to this study, under-five children in rural Jalaun, Uttar Pradesh, suffer from a significant burden of malnutrition. Anthropometric failure was identified in more than half (54.3%) of the children, with stunting being the most common (40.54%), followed by underweight (34.05%) and wasting (17.57%). Nutritional results were significantly influenced by sociodemographic characteristics, including family type, mother education, and socioeconomic level. In order to address undernutrition and enhance child health in rural areas, these findings highlight the critical need for focused nutritional interventions and multi-sectoral initiatives centred on maternal education, family welfare, and poverty alleviation.

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