

# Factors Influencing Nutritional Status among Pregnant Women and Lactating Mothers Inrural Community Settings in Odisha State, India

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**Abstract:** ***Introduction:** Malnutrition adversely affects physical function, impeding growth, work, and disease resistance. In rural Tigriria, the underdeveloped socio - economic status, compounded by factors like low economic conditions and poor hygiene, is associated with malnutrition. Maternal nutritional status significantly influences pregnancy outcomes and newborn health, requiring specialized care. Healthcare providers must address unique nutritional needs during pregnancy and lactation. Sustainable solutions are necessary to tackle malnutrition in pregnant and pregnant lactating women (PLW). In rural Tigriria, targeted interventions and education for PLW are crucial due to insufficient awareness. **Methods:** A household survey at 10 Anganwadi Centres (AWC) identified Pregnant Women (PW) and Recently Delivered Women (RDW). Assessments included socio - economic/demographic profiles, ANC components, dietary intake, and nutritional outcomes. Logistic regression compared characteristics, nutrient intake, and nutritional status between ANC - utilizing and non - utilizing groups. **Results:** All women received inadequate ANC packages, with non - utilization linked to poverty, literacy, migration, and duration of stay. Nutrition counseling was reported by a quarter of the population. Suboptimal protein and micronutrient intake prevailed, with no difference in ANC impact on nutrient intake or anemia prevalence. Enhanced nutrition counseling within ANC/PNC is crucial for improving poor nutritional status. **Conclusion:** Empowering community - based health workers is vital given the burden on the public health system. Mandatory institutionalized nutrition services, discussed in Gram Sabhas, can contribute to lasting solutions.*

**Keywords:** Malnutrition, Pregnant lactating women, Anganwadi Centres, Delivered Women

## 1. Introduction

The United Nations (UN) has included "good health and well - being for all" as one of the 17 sustainable development goals (SDGs) aimed at global achievement by 2030 [1]. This goal reflects a more comprehensive understanding of health compared to past approaches, acknowledging the growing demand for healthcare on the international stage. Despite the establishment of this objective, maternal and child health outcomes continue to be a significant global challenge.

Maternal and child undernutrition, which encompasses issues like stunting, wasting, and deficiencies in essential vitamins and minerals, is a widespread concern with far - reaching implications. These consequences extend to survival rates, the prevalence of acute and chronic diseases, healthy development, and economic productivity [2-4]. In many developing countries, numerous women grapple with undernutrition, yet this problem has not received adequate attention as a crucial factor influencing poor maternal, newborn, and child health (MNCH) outcomes [5].

It is imperative not to overlook maternal undernutrition, as it plays a pivotal role in contributing to developmental deficits in children and adversely impacting the health of both the child and the mother [2, 4, 6, 7]. Addressing these challenges is vital in the pursuit of the UN's SDG for good health and well - being for all by 2030.

Maternal undernutrition poses a significant threat to maternal health and is a leading cause of maternal mortality. Additionally, the health status and behaviors of mothers can

greatly impact the well - being of newborns and the overall mortality rates of children. Recognizing the seriousness of these issues. [8]Malnutrition is among the four leading causes of child mortality around the globe. In 2013, the World Health Organization (WHO) reported malnutrition was linked to 45% of all childhood deaths. Malnutrition is a contributing factor in the deaths of 60.7% of children diagnosed with diarrheal diseases, 57.3% of deaths associated with malaria, 52.3% deaths associated with pneumonia, and 44.8% of deaths from measles.22 The UN Standing Committee on Nutrition estimated 26.5% of children in developing countries were stunted in 2005, 5 and one year later, the United Nations Children's Fund (UNICEF) reported South Asia had a 46% prevalence of stunting in children under five [9].

In response to the issue of malnutrition deficiencyamong pregnant and lactating mothers in Ethiopia, the government has implemented various measures. Capacity building programs have been conducted for Health Extension Workers and health task forces to equip them with the necessary knowledge and skills to address malnutrition in vulnerable women. Additionally, the Female Development Army plays a crucial role in raising awareness, particularly among pregnant and lactating mothers, about the importance of proper nutrition. As part of the current approach, pregnant and lactating mothers undergo monthly screenings for Chronic Energy Deficiency during their antenatal and postnatal care visits. This regular screening enables timely support and intervention to be provided when required. Despite these efforts, malnutrition remains a significant health challenge for pregnant and lactating mothers in Ethiopia, contributing to the country's second - highest rate of malnutrition in Sub - Saharan Africa. A cross - sectional

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study conducted in Nekemte, Oromia regional state, Ethiopia in 2015 found a prevalence of malnutrition or Chronic Energy Deficiency among lactating women to be 27%. [10]

Maternal malnutrition is caused by complex interaction of a multitude of factors. Severe illness, breastfeeding and having several children below 2 years of age are negatively associated with maternal nutritional status, while higher maternal age and socio - economic status, and household food security have positive effect. In addition, social factors, such as marital status, education, and income also have influence [11]

Undernutrition in the mother has direct effects on maternal mortality and children's healthy development and health status. It is especially important to ensure that lactating women maintain a good nutritional status, as it is directly linked to the developing child's health. This study aims to evaluate the extent of nutritional status among pregnant women and lactating mothers in rural Tigiria, Odisha, India. Additionally, the research aims to identify the factors that influence the nutritional status of these women in the same region. Furthermore, the impact of nutritional counseling, taking into account factors like access to food, socioeconomic status, race - ethnicity, and cultural food choices, will be investigated. By examining these aspects, the study intends to contribute valuable insights into addressing malnutrition and improving the well - being of pregnant and lactating women in this region.

## 2. Methods

### Study population and Study design

The study was conducted in Tigiria Block of Cuttack district, Odisha state, India. The study was conducted covering 10 Anganwadi Centre (AWC) to identify pregnant woman (PW) and recently delivered woman (RDW) during a period February 2021 to March 2022. The quantitative study involved administering structured questionnaires to lactating women, while the qualitative study involved conducting semi structured interviews face - to - face with seven stakeholders. Socio - economic and demographic profile, various components of ANC received including nutrition counselling, dietary intake and nutritional outcomes based on anthropometric tables and anemias status were assessed. Descriptive summary for services and counselling received; dietary and nutrient intake during ANC/ PNC were presented. We used purposive sampling for

this research covering ten Anganwadi center (AWC) for identified pregnant women and Lactating mothers. Total no of 270 pregnant women and lactating mothers were selected from Rural Tigiria in Cuttack district, Odisha.

### Ethical Consideration

Ethical approval and a permission letter to conduct the research were obtained from the state health department of Odisha and Indian Council of Medical research, New Delhi. Participants agreed to participate in the study based on their willingness and capacity to provide informed consent, and they also guaranteed that disagreements with the study's findings and withdrawal from it would not have an impact on the services to be rendered. After obtaining each participant's signed informed consent, the interviews were conducted.

### Data collection procedure

Recruitment of the research team was carried out in collaboration with local frontline health workers. Experienced individuals who had conducted similar interviews were engaged for the purpose. The investigator lead checked the activities of each member daily. Three investigators coordinated the overall data collection process. A total of 10 Anganwadi workers (AWWs) facilitated the data collection work. Face - to - face interviews were held using a structured and field - tested questionnaire to collect data on sociodemographic and economic characteristics of the women and their households and exploring malnutrition issues. The researcher took prior consent of the pregnant women and lactating mothers before data collection. The guidelines for assessing nutrition-related knowledge, attitudes, and practices provided by the Food and Agriculture Organization of the United Nations were used to assess participants' nutrition-and health-related knowledge, attitudes, and practices [12].

## 3. Results

A total of 123 PW and 147 lactating mothers were interviewed during the study. Detailed analysis of the socio - demographics characteristics of the respondents indicated that (87%) were in the 20-30 - year age group.7% of the mothers were <20 years of age. Regarding educational status most of them are educated and having the capacity of understanding. Majority of the respondents were housewife (96%), 91 % respondent were Hindu and 9 % were Muslim. As opined by the respondent 58 % were using unprotected drinking water and 42% were using piped water.

**Table 1:** Sociodemographic characteristics of pregnant women and lactating mothers in Rural Tigiria (N= 270)

Respondents	Frequency	Percentage (%)	
Pregnant women	123	45.55	
Lactating mothers	147	54.44	
Characteristic	Categories	Frequency	Percentage%
Residence	Rural	270	100
	<20	18	6.66
Age (years)	20 - 30	234	86.66
	31 - 40	17	6.29
	41 - 49	1	.37
Educational status	Primary	0	
	Lower Primary	12	4.44
	Upper Primary	55	20.37
	High School	115	42.59

	Higher Secondary	45	16.66
	Bachelor's degree	42	15.55
	Master's degree	1	.37
	Master's above	0	
Religion	Hindu	246	91.11
	Muslim	24	8.89
	Christian	0	
Employment	Private Job	7	2.59
	Govt. Job	3	1.11
	Self employed	0	
	Daily Laborer	0	
	House wife	260	96.29
Household income (annual)	< 1 Lakh	92	34.07
	1lakhs – 2 lakhs	98	36.29
	2lakhs - 4 lakhs	45	35.18
	4 lakhs – 6 lakhs	19	7.30
	6 lakhs – 8 lakhs	14	5.18
	8 lakhs - 10 lakhs	2	.74
	10 lakhs above	0	
Latrine use	Yes	169	62.60
	No	101	37.40
Source of drinking water	Piped water	114	42.22
	Un protected drinking water	156	57.78

The sociodemographic profile of the sample is presented in Table 1. Pregnant women were less than lactating mothers 45.56% vs 54.44%. All the subject are lived in rural areas, and education status of all the subjects in percentage are primary 0%, lower primary 4.44% upper primary 20.37%, higher school 42.59%, higher secondary school 16.66%, bachelor degree 15.55% and master degree.37%. The majority of employment are house wife and her family annual income are in percentage bellow 1 lakh 34.07%, 1 - 2 lakhs 36.29%, 2 - 4 lakhs 35.18%, 4 - 6 lakhs 7.3%, 6 - 8 lakhs 5.18%, and 10 lakhs to above 74%. Additionally, more than half drank unprotected water and almost half of them had access to a toilet.

**Table 2:** Height and Weight measurements of pregnant women and lactating mothers in Rural Tigriria (N= 270)

Measurements PW	No	Range	Percentage
Weight (kg)	49	37 - 50	39.83
	74	51 - 74	60.17
Height (m)	67	1.21 - 1.52	54.47
	56	1.55 - 1.67	45.53
Measurements LM	No	Range	Percentage
Weight (kg)	64	36 - 50	43.54
	83	51 - 82	56.46
Height (m)	83	1.21 - 1.52	56.46
	64	1.55 - 1.76	43.54

This table - 2 shows the height and weight measurements of pregnant women and lactating mothers involved in the study. According to the results, most of the women have a normal BMI while 39.83% PW and 43.54 % LM are underweight

**Table 3:** Nutritional status of the pregnant women and lactating mothers in Rural Tigriria (N= 270)

Variables	Category	Frequency	Percentage (%)
Knowledge of nutritional status	Yes	95	35
	No	175	65
Dietary style	Vegetarian	2	0.74
	Both (Veg and non - veg)	268	99.25
	Diary Product	183	67.78
	Diary Product (Not consuming)	87	32.22
Using iodized salt to cook main meal	Yes	246	91.11
	No	24	8.88
Habit of consuming fresh citrus fruits/ juices	Yes	100	37.03
	No	170	62.96
Eating fruits and vegetables	Yes	241	89.25
	No	29	10.74
Iron supplements	Yes	244	90.37
	No	26	9.62
Frequency of more than usual meals per day	Yes	228	84.44
	No	42	15.55
Habit of eating more carbohydrates	Yes	194	71.85
	No	76	28.14
Eating protein, e. g. meat, milk and milk products daily	Yes	212	78.51
	No	58	21.48

Table 3 presents the nutritional status of the pregnant women and lactating mothers that participated in the study. The majority (96.29%) of the women have knowledge regarding their nutritional status while, 74% are vegetarian and 99.26% eat meat and dairy products use 67.78% and not consuming 32.22%. Using iodized salt to cook main meal 91.11%. Habit for consuming fresh fruit juices is in percentage YES 37.03% and NO 62.96%. Eating fruit and vegetable in percentage is YES 89.25% and NO 10.75%, do not use iron supplements during pregnancy or lactating period 9.62%. subject is frequently more than using meal per day in percentage is YES 84.44% and No 15.55% and they do consume carbohydrates in parentage are YES 71.85% and NO 28.14%. Eating protein like milk and milk products daily in percentage is YES 78.51, and NO 21.48%.

**Table 4:** Healthcare practices of pregnant women and lactating mothers in Tigriria (N= 270)

Variables	Categories	Frequency	Percentage (%)
Often visits the health centre	Yes	263	97.40
	No	7	2.59
Family planning utilization	Yes	105	38.88
	No	165	61.11
Methods of family planning	Yes	98	36.29
	No	172	63.70
Care of pregnant women and lactating mothers by family	Yes	240	88.88
	No	30	11.11
Care of pregnant women and lactating mothers by service provider	Yes	245	90.74
	No	25	9.25
Use of additional food for pregnant women/lactating mothers	Yes	183	67.77
	No	87	32.22

Table 4 presents the health practices of pregnant women and lactating mothers who participated in the study. As shown, most of them visit the health center often 97.2%, utilization of family planning in percentage is YES 38.88% and NO 61.11. Adopted methods of family planning in percentage is YES 36.29% and NO 63.70%. Take proper care for pregnant women and lactating mothers by family in percentage is YES 88.88% and NO 11.11%. The majority of the participants reported that they received good care (90.74%), although 67.77% do not use additional food while pregnant/lactating.

#### 4. Discussion

This study examines the prevalence of malnutrition among pregnant women and lactating mothers in Rural Tigriria block, Cuttack, Odisha, and explores the relationship between sociodemographic characteristics and nutritional status.

In the current study, when categorizing participants based on their nutritional knowledge scores, we observed that 35.0% had low knowledge scores, 10% had medium scores, and 33.3% had high knowledge scores. This distribution contrasts with the findings of Perumal et al. [14] in a study involving pregnant women in Kenya, East Africa. In their study, 33.9% had low knowledge scores, 44.6% had medium scores, and 21.5% had high knowledge scores; a similar pattern was noted for Kenyan youths [15]. Notably, our

study revealed a significantly higher percentage of lactating women with high knowledge scores compared to those with medium knowledge scores. This disparity may be attributed to variations in participants' educational levels, exposure to nutritional education, and regional selection.

Regarding nutritional attitudes, our study showed that the majority of subjects held medium or high attitude scores, aligning with findings from numerous studies conducted in developing countries [13, 14, 15]. However, in terms of nutritional practices, a substantial proportion of participants (85.9%) exhibited medium or low scores. This differs from the results reported by Perumal et al. [14], where 85.7% of participants reported medium practice scores. The prevalence of low practice scores in our study seems to directly correlate with the poor nutrition status observed among lactating women. This raises questions about the actual impact of nutritional knowledge and attitude on practical behaviors. Okunaiya et al. [15] demonstrated that sufficient nutritional knowledge and positive attitudes have a significant impact on practical nutritional behaviors. In contrast, Masuku and Lan [16], in their study involving pregnant and lactating women in Swaziland, found that having nutritional knowledge and a positive attitude did not necessarily lead to improved nutritional practices. In a study focusing on youths, Kigaru et al. [14] discovered that while nutritional knowledge alone did not influence nutritional practices, attitude emerged as a crucial factor affecting these practices. It is important to note the difficulty in directly comparing their findings with those of our study, as they measured attitude in a simplified manner—whether individuals cared about their eating habits or not. Therefore, the analysis of factors influencing nutritional practices should carefully consider regional and target population characteristics, as well as the specific content of the assessment instrument being utilized.

Our findings revealed a positive correlation between the education levels of both the household head and the participants themselves with nutritional practices. Additionally, participants in the 5th income quintile demonstrated significantly higher practice scores compared to those in the 1st, 2nd, and 3rd quintiles. Previous research has suggested that this phenomenon is attributed to women with higher economic statuses and education levels being more likely to have daughters who receive quality education. This education is identified as the most effective means of mitigating poverty and undernutrition [17, 18]. It has been established that the nutritional and anemia status of children varies two to three times based on the mother's educational level and the wealth quintile [13]. In essence, both income and education level are directly linked to breaking the cycle of poverty.

The factors influencing nutritional practices were identified as having an education level beyond primary school and belonging to the 5th income quintile. These findings align with previous research [14, 16, 19], emphasizing that nutritional knowledge and attitudes do not exhibit a direct correlation with actual practices. Instead, economic barriers and educational attainment emerge as robust influencing factors. Ambadekar and Zodepy [20], as well as Lloyd [21], have underscored the significance of economic status in



determining undernutrition. Consequently, future nutritional initiatives should incorporate components that focus on promoting community - based economic activities, aiming to enhance the economic independence of participants.

The hindrances to improving maternal and child nutrition status encompass insufficient nutritional programs, an incomplete national policy on nutrition, a lack of general interest in addressing undernutrition, an inadequate economic environment, and the absence of partnerships to generate sustainable solutions. Overcoming these challenges requires a reinforcement of public relations concerning nutrition issues and the development of a comprehensive nutrition education program that takes economic factors into account while fostering partnerships among families, communities, and the government. Recognizing that promoting nutritional practices can have a more direct impact on maternal nutrition status compared to simply enhancing nutritional knowledge, our identification of the factors associated with nutritional practices holds significance for the effective implementation of future nutrition projects.

## 5. Conclusion

The critical findings of this study are as follows: Firstly, education and income levels have a stronger impact on nutritional practices compared to nutritional knowledge and attitudes among pregnant women and lactating mothers. Factors influencing their nutritional practices were identified. Secondly, there is a need to identify the barriers that hinder improvements in maternal and child nutrition. However, the study has certain limitations that should be addressed in future research. The participants were recruited through purposive sampling only in the rural Tigiria area, which is relevant given the prevalence of nutrition deficiency among pregnant women and lactating mothers. Additionally, the study's cross - sectional nature limits the ability to establish causal relationships among variables. Therefore, future studies should consider employing longitudinal study designs for analyzing causal relationships.

The study underscores the importance of pregnant women and lactating mothers receiving increased care and family support during their current condition. They also require social support, a healthy environment, and positive surroundings. Proper care for both the women and their children is crucial. However, the study indicates that many participants lack knowledge about preparing nutritious food and maintaining a balanced diet during pregnancy and lactation. Moreover, they are generally unaware of the self - care practices they should adopt.

Based on the study results, the following recommendations are suggested for the authorities: Appoint a family counselor at rural health centers to offer counseling services to pregnant women and lactating mothers. Organize awareness programs related to nutrition specifically tailored for pregnant women and lactating mothers. Implementing these recommendations can contribute to improving the nutritional status and well - being of pregnant and lactating women, thereby benefiting both them and their children.

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