

Dietary Pattern and Nutritional Status among Lactating Mothers in Slums of Bhubaneswar, Odisha

Rashmita Behera¹, Suryamani Patro^{2*} and Somila Das³

¹Ph.D. Scholar, Department of Home Science,
Rama Devi Women's University, Bhubaneswar (Odisha), India.

²Associate Professor, Department of Home Science
Rama Devi Women's University, Bhubaneswar (Odisha), India.

³Lecturer, Department of Home Science,
Maharshi Women's Degree College, Bhubaneswar (Odisha), India.

(Corresponding author: Suryamani Patro*)

(Received: 27 April 2023; Revised: 18 May 2023; Accepted: 25 May 2023; Published: 15 June 2023)

(Published by Research Trend)

ABSTRACT: Maternal health and nutrition significantly impact the well-being of mothers and their children, influenced by lifestyle and dietary factors. This cross-sectional study aimed to evaluate the lifestyle behaviors, dietary practices, food consumption pattern and nutritional status of mothers living in the slums of Bhubaneswar, Odisha. The data were collected by conducting interview of the respondents using semi-structured questionnaire. Anthropometric measurements like height and weight were taken using standard procedures. The findings revealed a diet dominated by staple foods, with limited consumption of nutrient-dense items. Most mothers adhered to a three-meal pattern, but low physical activity (less than 5% exercised regularly) and suboptimal sleep duration (5–7 hours) were noted. About 60 % underweight mothers were identified. These results highlight the need for targeted interventions promoting dietary diversity, increased physical activity, and improved sleep habits while addressing socio-economic disparities to enhance maternal health outcomes.

Keywords: Dietary practices, food consumption pattern, lifestyle behavior, Nutritional status, Anthropometry.

INTRODUCTION

Maternal nutrition plays a critical role in influencing the health of both mother and the child (Di Maso *et al.*, 2021; Gila-Díaz *et al.*, 2021). Adequate nutrition and healthy lifestyle habits are crucial for reducing the risk of malnutrition and associated health issues. During pregnancy and lactation nutritional requirement becomes high, an adequate nutrition during these periods is critical for optimum physical growth as well as cognitive development of children (FAO, 2016).

Several studies have reported that nutritious and diverse diet, especially during pregnancy and lactation is crucial for optimal physical and mental growth of child (Schwarzenberg *et al.*, 2018). Dietary intake of mother has a strong association with nutritional outcome of both mother and child (Corsi *et al.*, 2016; Kim *et al.*, 2017). In addition to the unhealthy diet, the WHO identifies other important behavioural factors, such as physical inactivity, smoking and increased alcohol consumption as common risk factors for chronic diseases (World Health Organization, 2014; 2017).

In lower economic settings, socio-economic challenges, cultural practices, and limited awareness contribute to suboptimal dietary and lifestyle behaviors leading to poor nutritional outcome in mother and child. The role of optimal nutrition during reproductive years of

women life has received a little attention of researchers, but become a focus of discussion and workshop (Harrison, 2020).

Keeping in view the significance of maternal health and nutrition and the limited research particularly among the slum dwelling mothers of Odisha, the present study was undertaken in slums of Bhubaneswar aimed to assess the dietary practices, food consumption pattern, lifestyle behaviour, and nutritional status of lactating mothers. Particular focus was placed on the frequency of food consumption, meal patterns, physical activity, and sleep duration to identify key factors influencing maternal health. Understanding these patterns is essential for designing effective health and nutrition programs tailored to the unique needs of the population.

METHODOLOGY

A. Study Design

This study adopted a cross-sectional research design to assess the lifestyle behavior, dietary pattern and household food security among slum dwellers in Bhubaneswar, Odisha. The study was conducted across selected slums within the Bhubaneswar, the capital city of Odisha.

B. Sampling Method

Based on population size and geographic distribution of slums of Bhubaneswar city, 15 number of slums were randomly selected randomly. Two hundred lactating mothers with at least one child of 0 to 1 year age were selected by Simple random sampling technique.

C. Data Collection Tools

Data related to life style behaviour and dietary pattern were collected through semi structured interviews using a pre-tested questionnaire. Frequency of consumption of different food stuffs were recorded through dietary recall method. Anthropometric measurements including height and weight were taken using standard procedures.

The questionnaire was divided into three sections:

1. Life style behaviour: Sleep pattern, Exercise pattern, smoking and alcoholic habit.

2. Dietary practices and food consumption pattern: Food habit, meal pattern, habit of tea and coffee consumption, frequency of consumption of different foodstuffs.

3. Anthropometric assessment: Height and weight

D. Data Analysis

BMI of the respondents were calculated and were classified into different nutritional groups as per WHO recommendation.

$BMI = \text{Weight (Kg)} / \text{Height (m}^2\text{)}$

WHO classification as per BMI:

Under weight: BMI less than 18.5

Normal weight: BMI 18.5 to 24.9

Over weight: BMI 25 to 29.9

Obesity: BMI is 30 or more

The collected data were entered into Microsoft Excel and analyzed using Statistical Package for Social Sciences (SPSS) version 20. Descriptive statistics, including frequencies, percentages and mean were used to describe life style behavior, dietary pattern and food consumption pattern of respondents. Inferential statistics, such as Chi-square tests was employed to establish association between nutritional status of the mother with socioeconomic status. A p-value of less than 0.05 was considered statistically significant.

RESULT AND DISCUSSION

A. Dietary practices and Life style profile

The lifestyle patterns observed among the respondents provide key insights into their dietary habits, sleep duration, and physical activity levels, all of which play a critical role in determining overall health and nutritional outcomes.

The dietary practice and life style profile of lactating mothers were presented in Table 1.

A good practice of the predominance of a non-vegetarian diet and adherence to a three-meal pattern was observed among the respondents, which may contribute to meeting basic nutritional needs. However, the widespread habit of consuming tea or coffee, typically 2 hours before or after meals, could influence nutrient absorption.

The average sleep duration of 5–7 hours, may be insufficient for optimal health, particularly for mothers with high physical and mental demands. Chronic sleep deprivation can negatively impact metabolism, immunity, and overall well-being, which are essential for maintaining good nutritional status.

A positive observation is the negligible prevalence of alcohol and drug consumption among respondents was observed which may contribute to better physical and mental health.

However, the low engagement in physical activity is concerning, as less than 5% of mothers reported participating in any form of exercise. Regular physical activity is vital for maintaining a healthy weight, improving cardiovascular health, and preventing lifestyle-related diseases such as diabetes and hypertension. The lack of exercise may also compound the nutritional challenges already present, potentially leading to poor health outcomes over time.

Gila-Díaz *et al.* (2021) reported that during the first month postpartum, breastfeeding women exhibited several nutritional imbalances and poor physical activity negatively influencing anthropometric parameters.

Food consumption Pattern. The food consumption frequency of the respondents has been depicted in Table 2.

Table 1: Distribution of respondents according to Dietary practices and Life style profile.

Variable	Category	Frequency	%
Food habit	Vegetarian	49	24.50
	Non vegetarian	151	75.50
Meal pattern	Two meal (L+D)	64	32.00
	Three meal	110	55.00
	Four or more meal	26	13.00
Meal Skipped	Yes	33	16.50
	No	167	83.50
Consumption of tea or coffee	Yes	179	89.50
	No	21	10.50
Time tea or coffee taken	During meals	0	0.00
	< 2 hour before/after meal	74	37.00
Duration of sleep	8-10 hours	9	4.50
	5-7 hours	191	95.50
	Any other	0	0.00
Exercise	Yes	9	4.50
	No	191	95.50
Smoking	Yes	0	0.00
	No	200	100.00
Alcohol	Yes	0	0.00
	No	200	100.00

Table 2: Distribution of respondents by Food consumption frequency.

Food Groups/frequency	4-6 times/week	2-4 times/week	1-2 times/week	Occasionally	Never
Cereals	200	0	0	0	0
Pulses	0	37	152	11	0
Milk and milk products	0	0	37	163	0
GLVs	0	127	73	0	0
Roots and tubers	170	30	0	0	0
Fruits and vegetable	0	0	0	200	0
Egg	0	35	105	11	49
Meat and meat products	0	1	50	101	48
Fat and oils	200	0	0	0	0
Sugar and Jaggery	89	24	34	52	0

The dietary pattern observed among the respondents reflects a diet heavily reliant on staple foods, with limited diversity in the consumption of nutrient-dense foods. Nearly all mothers reported frequent consumption of cereals, fats, and oils (4–6 times per week), indicating these are the primary energy sources in their diet. Similarly, the high consumption frequency of roots, tubers, and sugar/jaggery (more than 80% consuming 4–6 times per week) suggests that carbohydrate-rich foods form a significant portion of their diet.

However, the relatively low frequency of green leafy vegetable intake (more than 60% consuming only 2–4 times per week) points to a gap in the regular inclusion of essential micronutrient-rich foods. Pulses, an important protein source, were consumed only 1–2 times a week by 76% of respondents, highlighting a potential inadequacy in protein intake. Furthermore, while eggs were consumed by more than half of the respondents 1–2 times a week, the occasional consumption of fruits, vegetables, and milk/milk products by a majority (>80%) raises concerns about insufficient intake of vitamins, minerals, and calcium.

The occasional consumption of meat and meat products by nearly half of the respondents indicates limited access to or preference for animal-based protein sources. This dietary pattern may result in deficiencies in critical nutrients such as iron, zinc, and vitamin B12, which are primarily sourced from animal-based foods.

Overall, these findings suggest a diet that lacks diversity and is dominated by energy-dense, nutrient-poor foods. This could have significant implications for the health and nutritional status of the mothers, potentially contributing to malnutrition, micronutrient deficiencies, and associated health risks.

Wang *et al.* (2021) in their study among lactating women of European cohort, compared dietary intake of lactating women with European dietary reference values (DRVs) and found that women in all clusters had inadequate intakes of energy, pantothenic acid, folate, vitamin C, vitamin A, vitamin D, zinc, iodine, potassium and linoleic acid. Adequate intake for fibre and α -linolenic acid was only achieved in the 'vegetables' cluster. Overall, fat intake was above DRVs.

Nutritional status. The anthropometric parameters among lactating mothers have been displayed in Table 3.

Table 3: Distribution of respondents according to BMI and nut status.

Variables	Mean	Number	%
BMI (kg/m ²)	20.109±3.664		
Nutritional status			
Underweight	-	119	59.5
Normal	-	72	36.0
Overweight	-	4	2.0
Obesity	-	5	2.5

It is evident from the table that the mean BMI of the respondents was approximately 20.0 kg/m². About 60% of the respondents were classified as underweight, less than 5% were categorized as overweight, and 36% were within the normal BMI range.

The findings highlight significant nutritional challenges among the respondents, as evidenced by the mean BMI of approximately 20, which falls at the lower end of the normal BMI range.

Alarming, a majority (60%) of the respondents were underweight, reflecting widespread nutritional inadequacies among the respondents, which underscores the need for targeted interventions aimed at improving dietary diversity and ensuring access to nutrient-rich foods.

In contrast, only a small proportion (less than 5%) of respondents were overweight, indicating that over nutrition is not a widespread concern within this population. The proportion of respondents with a normal BMI (36%) suggests that nearly one-third of the population achieves adequate nutritional status.

Mardani *et al.* (2020) from their study among lactating Women in the Urban and Rural Areas of Southwestern Iran observed that the mean age and body mass index (BMI) of the mothers were 29.78±6.24 years and 26.11±3.70 kg/m².

Association between BMI and SES. The BMI status of lactating mothers with reference to socio economic status has been depicted in Table 4.

Table 4: Association between BMI and SES of respondents.

Socio demographic variables	Categories	BMI				P Value
		Under weight	Normal	Over weight	Obesity	
Size of family	3 or less	54	39	2	3	0.705
	4 – 6	54	30	1	2	
	6 or more	10	4	1	0	
Type of family	Nuclear	82	56	2	4	0.514
	Joint	36	17	2	1	
Educational level of mother	Illiterate	13	10	0	0	0.961
	Up to high school	56	34	3	2	
	Intermediate	34	20	1	2	
	Graduate	15	9	0	1	
Educational level of father	Illiterate	7	4	1	0	0.597
	Up to high school	20	18	1	0	
	Intermediate	46	26	2	2	
	Graduate	25	17	0	1	
	Post Graduate	20	8	0	2	
Socio Economic Class	Lower	6	3	1	0	0.036
	Upper lower	85	62	2	2	
	Lower middle	27	8	1	3	
	Upper middle	0	0	0	0	
	Upper					
HH Food Security Level	Food secure	8	3	1	1	0.128
	Mild food insecure	71	37	1	4	
	Moderate food insecure	39	33	2	0	
	Severe food insecure	0	0	0	0	

The analysis revealed that socio-economic class was the only variable showing a statistically significant association with the nutritional status of mothers ($p < 0.05$). This finding underscores the critical role of socio-economic factors in determining maternal nutrition. Families with higher socio-economic status often have better access to diverse and nutrient-rich foods, improved healthcare, and overall better living conditions, which collectively contribute to better nutritional outcomes.

Interestingly, other variables such as family size, type of family, educational qualification of parents, and household food security did not exhibit statistically significant associations with maternal nutritional status. Verma and Gupta (2021) studying among women in Yamuna area of Prayagraj District, observed that factors like lack of history of illness, a poor diet's nutritional diversity, a lack of nutritional knowledge base, poor dietary practice, low self-efficacy perception and poor hygiene practices enhances the likelihood of under nutrition.

CONCLUSION

The study highlights several critical areas requiring attention to improve the nutritional and overall health status of mothers. While a structured meal pattern and the avoidance of alcohol and drugs were positive findings, the diet lacked diversity, with infrequent consumption of fruits, vegetables, and protein-rich foods. The widespread consumption of tea and coffee, coupled with low physical activity levels, presents additional concerns. Interventions aimed at promoting dietary diversity, encouraging physical activity, and raising awareness about the impacts of tea and coffee on nutrient absorption are urgently needed.

Additionally, strategies to improve sleep duration and quality could further enhance maternal health. Community-based programs that integrate nutrition education, physical activity promotion, and socio-economic support can create a holistic approach to addressing these challenges.

FUTURE SCOPE

This study highlights critical areas for improving maternal health and nutrition, offering several directions for future research and interventions. Further research can also examine the impact of cultural and traditional food practices on maternal health to develop context-specific solutions. Expanding this study to include diverse urban and rural settings would provide a broader understanding of maternal health determinants in various socio-economic contexts.

Conflicts of Interest. None.

REFERENCES

- Corsi, D. J., Mejía-Guevara, I., & Subramanian, S. V. (2016). Improving household-level nutrition-specific and nutrition-sensitive conditions key to reducing child undernutrition in India. *Social science & medicine*, 157, 189-192.
- Di Maso, M., Eussen, S. R., Bravi, F., Moro, G. E., Agostoni, C., Tonetto, P., & Ferraroni, M. (2021). Dietary intake of breastfeeding mothers in developed countries: a systematic review and results of the MEDIDIET study. *The Journal of Nutrition*, 151(11), 3459-3482.
- FAO (2016). FANTA Minimum dietary diversity for women: a guide for measurement. Rome: FAO. 2016, 82.
- Gila-Díaz, A., Díaz-Rullo Alcantara, N., Herranz Carrillo, G., Singh, P., Arribas, S. M., & Ramiro-Cortijo, D. (2021). Multidimensional approach to assess nutrition

- and lifestyle in breastfeeding women during the first month of lactation. *Nutrients*, 13(6), 1766.
- Kim, R., Mejía-Guevara, I., Corsi, D. J., Aguayo, V. M., & Subramanian, S. V. (2017). Relative importance of 13 correlates of child stunting in South Asia: Insights from nationally representative data from Afghanistan, Bangladesh, India, Nepal, and Pakistan. *Social Science & Medicine*, 187, 144-154.
- Mardani, M., Abbasnezhad, A., Ebrahimzadeh, F., Roosta, S., Rezapour, M., & Choghakhori, R. (2020). Assessment of nutritional status and related factors of lactating women in the urban and rural areas of southwestern Iran: a population-based cross-sectional study. *International journal of community based nursing and midwifery*, 8(1), 73-83.
- National Academies of Sciences, Engineering, and Medicine, Health and Medicine Division, Food and Nutrition Board In: Harrison M, ed. Nutrition during pregnancy and lactation: exploring new evidence: proceedings of a workshop. Washington, DC: National Academies Press; 2020.
- Schwarzenberg, S. J., Georgieff, M. K., Daniels, S., Corkins, M., Golden, N. H., Kim, J. H., & Magge, S. N. (2018). Advocacy for improving nutrition in the first 1000 days to support childhood development and adult health. *Pediatrics*, 141(2).
- Verma, T. and Gupta, A. (2021). Prevalence and Associated Factors of Maternal Malnutrition Among Women in Yamuna Area of Prayagraj District. *Biological Forum – An International Journal*, 13(3a), 781-788.
- Wang, D., Thielecke, F., Fleith, M., Afeiche, M. C., De Castro, C. A., Martínez-Costa, C., & Samuel, T. M. (2021). Analysis of dietary patterns and nutritional adequacy in lactating women: a multicentre European cohort (ATLAS study). *Journal of Nutritional Science*, 10, e17.
- World Health Organization (2014) Global Status report on non-communicable diseases 2014. Geneva, Switzerland: WHO. <https://www.who.int/nmh/publications/ncd-status-report-2014/en/> (accessed November 2019).
- World Health Organization (2017) Non communicable Diseases Progress Monitor. Geneva: World Health Organization 2017. License: CC BY-NC-SA 3.0 (accessed October 2019).

How to cite this article: Rashmita Behera, Suryamani Patro and Somila Das (2023). Dietary Pattern and Nutritional Status among Lactating Mothers in Slums of Bhubaneswar, Odisha. *Biological Forum – An International Journal*, 15(6): 972-976.