



Nutritional status of lactating mothers: a study among the Ahom women of Lakhimpur District, Assam

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KEYWORDS

Health, Nutrition, Lactation, Ahom women, Assam.

ABSTRACT

Women are generally susceptible to under-nutrition, especially during pregnancy and lactation period. Effective pregnancy and lactation require changes in the body for the proper functioning of various physiological systems. As such, the nutrient requirement of the body increases during these periods. Poor health and nutritional insufficiency in mothers' during these periods will lead to poor secretion of nutrients in the breast milk, and this may have long-term detrimental impact on the child's health. During the lactation period, the nutritional and health status of the newborn child depends on the mother. Hence, health and nutritional status of the mother during this period becomes all the more essential. In the present study, an attempt has been made to assess the health and nutritional status among the Ahom lactating women of Lakhimpur District, Assam.

Introduction

The pregnant and lactating women form one of the most nutritionally vulnerable segments of the population. Their nutritional status affects not only the mother, but also her offspring. Effective pregnancy and lactation require changes in the body for the proper functioning of various physiological systems; therefore, the requirement of nutrients in the body increases during this time. It places high demands on maternal stores of energy, protein, and other nutrients. Virtually all mothers, unless extremely malnourished, can produce adequate amounts of breast milk. The energy, protein, and other nutrients in breast milk come from a mother's diet or her own body stores. Therefore, a lactating mother requires high nutritious food to accumulate calories for the production of adequate quantity of milk without deteriorating her health (Raman et al. 2001:110-13; Picciano 2003:133). Yet, women in developing countries often fail to consume additional food and supplements required to meet the demands during pregnancy and lactation (Aikawa et al. 2006:443-48; Baig-Ansari et al. 2008:132-39; Kotecha 2009:584-89).

In India, the food consumed by many pregnant women and lactating mothers is poor and lacks in many essential nutrients. Several studies (Jood et al. 2002:121-31; Pathak et al. 2004:1007-14; Saxena 2008:5-7; Singh et al. 2009:624-29; Kumar et al. 2013:134-39; Ghosh-Jerath et al. 2015:20; Bairwa et al. 2017:927-34) have shown that the nutrient and dietary intake by pregnant and lactating women are very low in comparison to the Recommended Dietary Allowances (RDA) as suggested by ICMR (2010:01-255). The lack of sufficient calories, of the macro and micro-nutrients, can lead to deficiencies of building materials for the healthy growth and development of the child. Therefore, a diet that meets

all the nutritional needs is required so that the wellbeing of the mother is ensured with the birth of a healthy child (Udipi et al. 2002:548-57).

Despite the existence of several policies and programs, like National Nutrition Policy (1993), National Nutrition Plan of Action (1995), National Nutrition Mission (2001), Integrated Child Development Scheme (ICDS), the Targeted Public Distribution System (TPDS), Food for Work, the National Programme of Mid Day Meal in Schools (1995), popularly known as Mid-Day Meal Scheme (now renamed as PM POSHAN or *Pradhan Mantri Poshan Shakti Nirman*), Micronutrient (Iron folate; Vitamin A; Iodized salt) Schemes, etc., malnutrition among pregnant and lactating women continues to be a serious public health issue in India. Over the years, the problem has not received the requisite attention in public health policies, programmes and initiatives of the government. Keeping these facts in mind, the present study was undertaken to understand the health and nutritional status among the lactating Ahom women of Lakhimpur District, Assam.

Lakhimpur district is one of the largest administrative districts of Upper Assam in North East (NE) India. The district is situated between 26.48' and 27.53' North latitude and between 93.42' and 94.20' East longitude and occupies an area of 2,277 sq. km. The district is inhabited by a number of tribal and non-tribal ethnic groups like Tai-Ahom, Koch Rajbongshi, Kalita, Chutia, Brahmins, Kaibartta, Bodo, Mishings, Sonowal Kachari, Rabha, Deori, Tai-Khamti, Muslims, etc.

Ahom is a Tai Mongoloid population of Assam. Presently, they are composed of the admixed descendants of the Tai/Shan people who migrated to the Brahmaputra valley of Assam in 1228 from Yunnan Province, China and the local indigenous people who joined them over the course of history. They predominantly inhabit the Upper Assam districts viz. Lakhimpur, Sivasagar, Dibrugarh, Jorhat, Tinsukia, Dhemaji, Golaghat and Sonitpur, and sporadically distributed in the districts of Nagaon, Morigaon, Kamrup and Karbi Anglong.

Materials and methods

Study area and subject

The present study is a community based cross-sectional study carried out among the lactating Ahom women in two localities – (i) Village Bantow No. I, a typical rural village homogeneously populated by the Ahom community, in Dhakuakhana Sub-Division and (ii) Lilabari, a semi-urban area densely populated by the Ahom community, in North Lakhimpur Sub-Division, in Lakhimpur District, Assam. The sample size consists of 101 lactating women. The purposive sampling method was used to collect the data. The women having child below six months of age and continuing with breastfeeding were considered as respondents for the present study. The data have been collected only from those women who willingly volunteered to participate as respondents for the study.

Socio-demographic information

A pre-designed survey schedule was used to collect the socio-demographic data like age, occupation, family income, educational status, family type, religion and self-reported morbidity. The monthly family income (in Indian rupees) of the respondents has been categorized into – up to Rs. 5,000.00, Rs. 5,000.00 to 10,000.00 and Rs. 10,000.00 and above. The self reported morbidities of last one year from the date of the interview was taken and categorized as acute illness - an illness which is only present for a few days like diarrhea/dysentery, all types of fever, etc. and chronic illness - an illness that is based on

symptoms pertaining to a particular sickness persisting for more than one month and also in respect of illness where it was diagnosed.

Anthropometry

The anthropometric characteristics viz. height, weight and upper arm circumference were measured for nutritional assessment following the standard anthropometric methods (Singh & Bhasin 2004:149-204). The Body Mass Index (BMI) was calculated by weight in kilograms, divided by height in meter squared and classified the indices according to WHO, Asian- BMI classification (WHO Expert Consultation 2004: 157-63) as underweight; <18.5, normal range; 18.5-22.9, overweight; 23–24.9, obese I; 25-29.9, obese II; >30. The cut-off of Mid Upper Arm Circumference (MUAC) was adopted with an internationally accepted standard (James et al. 1994:883-94) as underweight; <22.0, and normal >22.0.

Haemoglobin concentration

Haemoglobin concentration was examined with haemoglobin colour scale method approved by WHO, and the concentration of haemoglobin was categorized according to the classification of WHO (2011:03) as Non- anaemic; Hb>12 g/dl, Mild anaemia; Hb 11-11.9 g/dl, Moderate anaemia; Hb 8-10.9 g/dl, and Severe anaemia; Hb< 8 g/dl.

Dietary assessment

The dietary information was collected through two standard methods viz. Food Frequency Questionnaire Method and 24-Hour Dietary Recall Method.

In the Food Frequency Questionnaire Method, the respondents were presented with a list of food items and were required to say how often each item is consumed, in broad terms and categorized into six grade scales viz. every day, once, twice, frequently, occasionally and never per week.

In the 24-Hour Dietary Recall Method, the subjects as well as the person who prepares food in the household was asked to recall a day's food intake in terms of simple household measures for three days. At the time of the interview, food models and reference standard measuring cups and spoons were shown to the subjects so that they could give the amount accurately. Values of household measures, e.g. cups, spoons were converted into raw equivalents and the nutrient intakes were calculated using the food composition table prepared by Gopalan et al. (2009:8-94).

Statistical analysis

The statistical analysis of the collected data was calculated using Microsoft Excel 2007 and SPSS 21.0 version. The data are presented by mean, standard deviation, standard error, and simple per centage.

Results

Socio-demographic characteristics

In the present study, most of the lactating women (60.4%) belong to the age group of 21 to 29 years. Women having child (below six months) in higher age (≥ 40 years) accounts for only 1 (1.0%) respondent and in ≤ 20 years it is 7.9%. In terms of educational attainment, only 1 (1.0%) respondent

is found without any institutional education. The larger section (75.2%) is found to be educated with matriculation and above. All the lactating Ahom women are Hindus by religion. The majority of the lactating women (93.1%) remain engaged with their daily chores of household activities. Government service holders accounts for only 6.9%. More than half (51.5%) of the women live in nuclear families and 48.5% live in joint families. As for family income, 23.8% respondents mainly depends on daily wage earning and their monthly family income is not more than Rs. 5,000.00; followed by 30.7% who belong to monthly family income range of Rs. 5,000.00-10,000.00 and 45.5% belong to the monthly family income of Rs. 10,000.00 and above. (Table-1)

Physiological parameters

Among the respondents i.e. the Ahom lactating women, the prevalence of anaemia is very remarkable. A total of 77.2% of the respondents were anaemic with the grades viz. mild anaemic (56.4%), moderate anaemic (19.8%) and severely anaemic (1.0%). Only 22.8% were found to be non-anaemic.

The anthropometric health index BMI shows that 45.5% of the Ahom lactating women were well nourished i.e. the BMI range between 18.5-22.9. The prevalence of underweight is 9.9% among them; and the prevalence of overweight (16.8%) and obesity (27.7%) is comparatively higher. Among the obese lactating women, 17.8% belongs to obese grade I and 9.9% belongs to obese grade II. The MUAC also shows less prevalence of underweight; only 15.84% fall in the underweight category.

The distributions of self-reported morbidities among the respondents reveal that there are 25.7% women suffering from different acute illnesses and 34.7% from chronic illness. Out of the different type of acute illness, fever is the most common. The prevalence of cough and cold is also quite common. The other incidences of acute morbidity are headache, body pain, back pain, toothache, etc. In case of chronic ailment, the incidence of gastric problem is very common. Gynaecological issues were also reported as chronic morbidity among them. A few incidences of body pain, muscle pain, problem of allergy, etc. were also reported. (Table- 2)

Dietary habit

The dietary habits of the lactating Ahom women reveal that all the women (100%) are non-vegetarian. Rice is the staple food among them. They take their regular meal three times a day viz. in the morning, in the afternoon and at night. With the morning tea they commonly take different types of homemade rice cakes (*Pithas*), biscuits, chapatti, bread, etc. Therefore, consumption of grain foods (cereals) is common among them as 100% of them consume it every day. Regarding the consumption of pulses like red gram, green gram, lentil, etc. it was observed that its consumption was also common among them as 51.5% took it regularly and 44.60% took it frequently. Only 2% of them had taken twice, as well as only 2% had never taken during the week.

The animal products like meat, fish and egg were largely used by the lactating women. Among them, 60.4% are taking fish frequently in their regular diet. It was informed by the respondents that fishes of different varieties are locally available in the river, ponds and also in the markets. Meat like pork, chicken and mutton are also easily available in the study area. But, consumption of meat is comparatively less in comparison to fish. Only 2% of them took meat frequently during the week prior to the date of the interview. Most women ate meat only once during the period of study. Intake of egg, milk and milk products were very deficient among the lactating women. Egg and milk and its products were never taken by 68.3% and 73.3% respondents respectively during the study period.

Consumption of green leafy vegetables was very common among the respondents. Varieties of green leafy vegetables are very easily available in their surroundings. Most households cultivate different seasonal green leafy vegetables in their kitchen garden. Among them 72.2% of the respondents are found to consume green leafy vegetables of different kinds frequently and 8.9% every day in their regular meal. Consumption of other vegetables like bottle gourd, ash gourd, pumpkin, French beans, long beans, cucumber, cauliflower, brinjal, ladies finger, etc. is unavoidable in their regular diet as 100% of them take these vegetables regularly.

It was observed that all the women took fruits and sugar and jaggery frequently, as well as fats and oil every day. (Table-3)

Food intake

The food intake of the lactating Ahom women (Table-4) reflects an imbalance diet. The comparative analysis of food intake of the lactating Ahom women and RDA reveals that except cereals and flesh food, in all other food groups the adequacy percentage is below the RDA. The adequacy percentage is more than hundred (136.06%) in cereals and more than two hundred per cent (218.53%) in flesh foods. The intake of milk and milk products (8.71%), leafy vegetable (16.23%) and fruits (27.39%) were very inadequate. The intake of pulses is also found below fifty per cent (47.52%) adequacy. In case of roots and tubers that include potatoes, onions, carrots, radish, colocasia bulbs, beetroots, etc. and other vegetables, the adequacy is 66.37% and 66.64% respectively. The consumption of sugar and jaggery (83.3%) is found to be little lower than the RDA.

Discussion

From conception to exclusive breastfeeding (up to six months) the baby completely depends on the mothers' nutritional status. All the nutrients that requires in the first six months entirely depends on the breast milk of mothers. Hence, eating healthy food in the lactating period helps the baby to develop and grow normally, and also keep the mother fit. If the mother is consuming a balanced diet comprising of various food groups, she gets the benefit of various nutrients that are necessary during lactation. In general, most women who are breastfeeding need about 500 calories more than a woman who is non-pregnant and non-lactating. However, a number of research studies documented that the lactating women from developing countries are nutritionally in vulnerable groups. In India as well, it is observed that diets of women are inadequate and in the lower socio-economic groups diet is essentially similar during pre-pregnant, pregnant and lactating period. In Indian societies, the food habits of pregnant and lactating women are greatly influenced by different social notions, beliefs, thoughts, traditions and taboos. Apart from these socio-cultural barriers, religion, education and economic factors also influence their food patterns. Consequently, there is widespread maternal malnutrition during these crucial periods.

The findings of the present study confirm a serious nutritional deficiency in the dietary intake of the lactating Ahom women of Assam. It reveals that except food groups' viz. cereals and flesh food, other foods were inadequate and was below the RDA of ICMR. Milk and its products provide rich protein and important minerals like calcium. Calcium is essential, both during pregnancy and lactation, for proper formation of bones and teeth of the offspring. It is also essential for secretion of breast milk and to prevent osteoporosis in the mother. But, the adequacy percentage of intake of milk and its products was only 8.71% among the Ahom lactating women. Food items with the highest nutritional worth like egg, milk and milk-based products were never taken by 68.3% and 73.3% Ahom lactating women respectively.

Vegetables and fruits are known as protective foods which are the richest source of vitamins and minerals. The vegetables are grouped into roots and tubers, green leafy vegetables and other vegetables. The root and tuber vegetables contain rich amounts of energy, carbohydrate, vitamins and minerals. The green leafy vegetables are rich sources of pro-vitamin A as well as iron and calcium. The other vegetables are also a good source of minerals, vitamins and fibers. The present findings reveals that the intake of vegetables and fruits were grossly deficient among the Ahom lactation women. The intake of leafy vegetables fulfil only 16.23% requirement and fruits fulfil 27.39% of the requirements. In the case of roots and tubers adequacy percentage was 66.37% and in other vegetables it was 66.64%.

Non-vegetarian food items such as meat, fish and egg are good source of protein. In the present study, it is important to note that among the Ahom lactating women, the intake of these non-vegetarian foods (flesh food) is remarkably higher than the RDA. The adequacy percentage was more than two hundred per cent (218.53%) in flesh food. A country wise survey conducted by the National Nutrition Monitoring Bureau (2006:13-24) showed that Indian diets are qualitatively adequate in protein, but notoriously deficient in some micro-nutrients. Thus, the findings of the present study are in line with the NNMB report.

Micro-nutrient deficiencies are widespread and coexist with chronic energy deficiency in pregnant and lactating women. Anaemia is one such micro-nutrient induced health condition and its adverse impact on mother and child has been very well recognized. During the period of lactation, mothers are susceptible to anaemia because of maternal iron depletion and blood loss during childbirth. The present study also reveals higher prevalence of anaemia (77.2%) during the lactating period among the Ahom women of Assam which is higher than the national level. In India, the prevalence of anaemia in lactating women is 58% (NFHS-4 2017a: 334). Different studies reveal that the incidence of anaemia is not only concentrated among the lactating women. Irrespective of age, women are very severely affected by anaemia in India. Siddharam (2011:922-24) state that the prevalence of anaemia among adolescent girl in Karnataka was 99.94% with 40.1% mild anaemia, 54.92% moderate anaemia and 4.92% severe anaemia. Gupta et al. (2011:1020-26) also reveals higher prevalence of anaemia (89.5%) in females (15-30 years) which include 49.8% of mild, 38.2% of moderate and 1.5% of severe anaemia cases. Verma et al. (2012:2422-28) also reported similar findings (70%) in females (20-50 years) that include 48.7% of mild, 19.9% of moderate and 1.5% severe anaemia cases. It is found that in NFHS-4 (2017b:335) the prevalence of anaemia in India is 55.3% with 38.6% having mild anaemia, 15.0% having moderate anaemia and 1.8% having severe anaemia.

In NE India, the Meitei of Manipur (68.89%; Singh & Mangang 2012:47-53) and the Deori of Assam (71.42%; Chatterjee et al. 2011:111-21) also show higher prevalence of anaemia in comparison to other population groups of NE India.

The reasons for the high incidence of anaemia among women are: increase in iron requirements, menstrual blood loss, discrepancy between high iron need for haemoglobin formation and low intake of iron containing foods, erratic eating habits, dislike for foods which are rich in iron like green leafy vegetables, vitamin C rich foods like guava and *amla*, iron absorption inhibitors in food phytates/tannins (Kishore 2006:82-84). Of these reasons, nutritional deficiency primarily due to a lack of bioavailability of dietary iron accounts for the majority of cases (Yip 1996:31-84).

Anthropometric measurements and its indices play a very important role in the field of health studies in the present era. The Body Mass Index (BMI) is considered to be one of the best variables for

anthropometric evaluation of nutritional and general health screening. In the present study, the results of the BMI show serious health problem among the lactating Ahom women of Assam. It reveals that only 45.5% of the lactating women are healthy. The prevalence of underweight is 9.9%. Likewise, the problem of overweight and obesity are also higher among them. The prevalence of overweight (16.8%), obesity-I (17.8%) and obesity- II (9.99%) are too high which has in fact crossed the rate of national prevalence in women in general (i.e. overweight 15.5%, obesity 5.1%; NFHS-4, 2017c:330). According to the NFHS-4 (2017d:333) report the prevalence of underweight is highest in Assam (20.7%) among the states of NE India as well as higher than the rate of prevalence in overall India (20.2%). It is important to note that the prevalence of underweight is comparatively lower in lactating Ahom women (9.9%) than the state as well as the National Level.

Studies reveal that women belonging to middle and higher-income groups seek antenatal care. They are more or less health conscious and are exposed to health education through the mass media. From different sources they hear that pregnant and lactating women should eat more healthy food to meet their own as well as their offspring's nutritional needs. Additional energy rich foods given traditionally to pregnant and lactating women as well as modern "balanced nutritious food" according to RDA are being given to these women by their families and are consumed regularly. They, however, do not really require additional dietary intake and hence tend to gain weight excessively. The problem is often aggravated further by a reduction in physical activity during pregnancy. As a result, these women may have a net weight gain from 5 to 10 kg at the end of one pregnancy and lactation (IGNOU 2017:21-40).

Conclusion

The findings of the present study show the prevalence of serious health and nutritional issues among the lactating Ahom women of Assam. Thus, emphasis should be given to proper scientific planning and intervention programmes related to women's health in general and lactating women in particular. The government and non-government organizations and the academia have to work in concert to improve the coverage of basic and effective nutrition interventions, including effective nutrition education and nutritional supplementation, dietary modification, etc. to pregnant and lactating women that would improve the health and nutritional status of women in the society. In addition, the entire health system needs to be revitalized to overcome the constraints that exist at the levels of policy, governance, and service-delivery, and also for fulfilling the demand by the lactating women at the household level.

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Tables

Table: 1 Socio demographic profile of the Abom lactating women

Variable	Frequency	Per centage
Age (years)		
≤20	08	7.9
21 - 29	61	60.4
30 - 39	31	30.7
≥40	01	1.0
Literacy		
Non educated	01	1.0
Primary school	02	2.0
Middle school	22	21.8
Matriculation and above	76	75.2
Occupation		
Household activities	94	93.1
Govt. service	07	6.9
Family type		
Nuclear	52	51.5
Joint	59	48.5
Family income		
Up to Rs. 5000	24	23.8
Rs. 5000- 10000	31	30.7
Rs. 10000 and above	46	45.5
Religion		
Hindu	101	100

Table: 2 Physiological parameters of the Abom lactation women

Variable	Frequency	Per centage
Haemoglobin level		
Severe anaemic	01	1.0
Moderately anaemic	20	19.8
Mild anaemic	57	56.4
Non anaemic	23	22.8
Body Mass Index (BMI)		
Under weight	10	9.9
Normal range	46	45.5
Overweight	17	16.8
Obese I	18	17.8
Obese II	10	9.99

Mid Upper Arm Circumference (MUAC)		
Underweight	16	15.84
Normal	85	84.16
Acute illness		
Yes	26	25.7
No	75	74.3
Chronic illness		
Yes	35	34.7
No	66	65.3

Table 3: Distribution of the lactation Abom women according to their frequency of consumption of different food stuff

Food items	Never	Once	Twice	Three time	Frequently	Everyday
Cereals	-	-	-	-	-	101 (100)
Pulses	2 (2.0)	-	2 (2.0)	-	45 (44.60)	52 (51.5)
Meat	16 (15.8)	46 (45.5)	36 (35.6)	1 (1.0)	2 (2.0)	-
Fish	2 (2.0)	15 (14.9)	23 (22.8)	-	61 (60.4)	-
Egg	69 (68.3)	23 (22.8)	6 (5.9)	3 (3.0)	-	-
Milk and its products	74 (73.3)	3 (3.0)	-	-	-	24 (23.8)
Leafy vegetable	-	13 (12.9)	1 (1.0)	-	78 (77.2)	9 (8.9)
Other vegetable	-	-	-	-	-	101 (100)
Fruits	-	-	-	-	101 (100)	-
Sugar and Jiggery	-	-	-	-	101 (100)	-
Fats and oil	-	-	-	-	-	101 (100)

Table 4 Distribution of the lactation Abom women according to their dietary intake

Food groups	Mean intake ± SE	RDA (non vegetarian lactating women)	Per cent adequacy
Cereals	449.01±2.2	330	136.06
Pulses	28.51±1.42	60	47.52
Flesh food	65.56±3.38	30	218.53
Milk and its products	43.56±8.16	500	8.71
Roots and tubes	79.65±0.97	120	66.37
Leafy vegetable	56.8±1.92	350	16.23
Other vegetable	86.63±5.61	130	66.64
Fruits	54.79±1.95	200	27.39
Sugar and Jiggery	16.66±0.61	20	83.3
Fats and oil	20.00±0.52	30	66.66