**Section:** Community Medicine

**Original Research Article**

# NUTRITIONAL STATUS ASSESSMENT AMONG LACTATING WOMEN IN DIBRUGARH DISTRICT, ASSAM

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## ABSTRACT

**Background:** Nutritional requirement are much higher during lactation than in any other stage of reproductive life in Women. As per various studies in the other developing countries malnutrition still continues to be major public health problem. The aim is to assess the nutritional status of the lactating mothers and its factor associated with the poor nutritional status. **Materials and Methods:** The study was conducted among 354 Lactating women in Dibrugarh District, Assam for a period one year from June 2015 to May 2016 through a Community based Cross-Sectional study to assess their nutritional status. The study population was described by using proportion, mean and standard deviation. To analyze the data various statistical scales were used like Chi-square test. **Result:** Age group, educational qualification, caste, rural areas, socio economic status and better health care utilization were found to be statistically significant with the nutritional status of the study participants. **Conclusion:** Nutrition education is one of the key interventions for the women in the reproductive age groups starting from adolescent and continuing though pregnancy and after birth. Platform like Village Health Nutrition Days (VHND) and Village Health Nutrition & Sanitation committees (VHSNC) should be utilized by the Health Care Workers to impart the nutrition education. In the Health Facilities, Nutrition counselors should play a key role to provide the nutrition intervention. Locally available nutritious foods should be promoted in various platforms.

## INTRODUCTION

Lactation is the process of synthesizing and secreting milk from the breast to feed young ones.[1] It is an integral part in the physiologic completion of the reproductive cycle of mammals including humans.[1] Nutritional requirement is considerably elevated during lactation than in any other stage of women's reproductive life.[2] Women who are breast-feeding should increase their energy and nutrient intake to levels above those of non-pregnant, non-lactating.[2]

Diets consumed by many lactating mothers in our country are poor and lack in many nutrients.[3] Thus, special attention should be given to the diet of mother during lactation. The diets of the lactating mothers vary from place to place.[3] Malnutrition continues to be a major public health problem throughout the developing world, particularly in southern Asia and sub-Saharan Africa. Worldwide, an estimated 852 million people were undernourished in 2000–2002, with most (815 million) living in developing countries.[4] Underweight in India seems to be a problem which cuts across all social and economic categories, whereas, the overweight or obesity seems to be more of a problem of the wealthier, urban women.[5] More than one third (36%) of women aged 15-49 years have a BMI below 18.5 Kg/m2.[5] The proportion of ever-married women who are thin (33%) has declined slightly from 36% in NFHS-2. NFHS-3 reported that the overweight/obesity has affected almost 15% of women, which are most common in urban areas, in wealthier households and among older adults.[5]

Studies on the nutritional status among the lactating women are very few in number so this present study


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has been undertaken to assess the nutritional status to further improve various intervention by Govt, and other stake holders.

## MATERIALS AND METHODS

This community based cross sectional study undertaken for period of one year from June 2015 to May 2016 to assess the nutritional status among lactating women aged 15-49 years living in Dibrugarh district, Assam. The study was conducted under the guidance of the Department of Community Medicine, Assam Medical College and Hospital, Dibrugarh.

**Sample Size:** The sample size (n) was calculated by using the formula, n = Z2pq/d2 (Where z = 1.96 ≈ 2 for 95% Confidence Interval, p = positive character (anticipated prevalence), q = 1-p and d is the allowable error). Considering the prevalence of body mass index below normal (< 18.5 Kg/m2) as 33% in ever-married women (NFHS-3) and taking 5% absolute error, the sample size was calculated to be 354.

**Sampling design:** The study participants were selected by the following procedure:

Step1: One Health Block was selected from the existing six Health Blocks of Dibrugarh District by using the lottery method of simple random sampling. The Lahoal Block was selected.

Step 2: Next the number of subcentre required for achieving the sample size was found out. There are a total of 32 subcentres under Lahoal block.The list of the subcentres with their estimated number of infants was collected from the District Immunization Office.

Step3: The total of subcenters required was determined by dividing the sample size by sub centre having least number of infants (Telpani Sub Centre had least number of infants). Now the total subcentres required was found out to be 24. Out of total 32 sub centers, 24 were elected by simple random sampling.

Step 4: Number of lactating women included from each selected subcentre was determined by using proportional allocation. In each of the subcentre the first house was selected randomly, thereafter consecutive houses were visited until the required number of study subjects in each subcentre was obtained. The same procedure was repeated in all the subcentre until the required sample size was achieved.

**Data collection technique:** Prior to the commencement of the field work, consents were taken from the study participants and a pre-designed and pre-tested proforma was used. The study participants having infant and in the age group of 15-49 years were included for the study. The study participants who were sick and were not breast feeding their baby during the visit were excluded from the study.

Anthropometric parameters like weight and height were measure for calculating the Body Mass Index.

**Statistical analysis:** The data was collected and compiled in the Microsoft excel. The scales like proportion, mean etc were used to describe the study population. The statistical association was done by using the Chi-Square test.

**Ethical Clearance:** Ethical clearance was obtained from the Institutional Ethics Committee (H) of Assam Medical College and Hospital, Dibrugarh.

Written informed consent was obtained from the study participants prior to the onset of the study.

## RESULTS

Among 354 study participants, majority (56.50%) were in the age group of 20-24 years followed by 26.55% of the study participants in the age group of 25-29 years. The mean age of the study participants was 23.34 ± 3.8 years. Majority (82.77%) of the study participants were Hindu, followed by the Muslim which were 14.97% of the study participants. Out of 354 study participants, 49.44% belonged to other backward Caste and 35.59% belonged to general caste. Among study participants, 22.88 % of the study participants were educated to high school followed by 16.67% in both middle and primary school while 27.97% were illiterate. Majority (76.84%) of the study participants were from rural area and 23.16 % of the study participants from urban area.

Majority (66.67%) of the study participants belonged to the joint Family and 33.33% of the study participants belonged to the nuclear Family. Among 354 study participants, 35.88% belonged to socio-economic class III followed by 29.94% of the study participants in socio-economic class IV. 45.19% of the study participants consumed betel nut/betel leaf, where as 18.64% had the history of tobacco chewing. [Table 1]

Majority (95.76%) had availed the antenatal care facility. Among study participants, 66.38% of the study participants had≥four Visit. Majority (89.83%) of the study participants had the history of completed tetanus toxoid immunization. Out of the 354 study participants, 50.85 % of the study participants had consumed≥ 100 iron and folic acid tablets. Majority (85.59%) of the study participants had delivered in hospital [Table 2]

Among 354 study participants, 25.99% , 15.54% and 1.41 % were belonged to underweight, overweight and obese category respectively whereas 57.06% were to normal body mass Index. [Figure 1].The mean weight of the study participants was observed to be 45.75 ±8.66 Kgs. The mean height of the study participants was observed to be 147.79 ± 5.93 cms. The mean body mass index of the study participants was found to be 20.98 ± 3.82 kg/m2. [Figure 1 & Table 3]

Age group, educational qualification, caste, rural areas, socio economic status and health care


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utilisation were found to be statistically significant with the nutritional status of the study participants.[Table 4 & Table 5]

**Table 1: Socio-Demographic profile of the study participants**

| Characteristics | Number | Percentages |
|---|---|---|
| Age of the participants (in completed years) | | |
| 15-19 | 31 | 8.76 |
| 20-24 | 200 | 56.50 |
| 25-29 | 94 | 26.55 |
| 30-34 | 22 | 6.21 |
| 35-39 | 7 | 1.98 |
| Religion | | |
| Hindu | 293 | 82.77 |
| Muslim | 53 | 14.97 |
| Christian | 8 | 2.26 |
| Caste | | |
| Schedule Tribe | 15 | 4.24 |
| Schedule Caste | 38 | 10.73 |
| Other Backward Class | 175 | 49.44 |
| General | 126 | 35.59 |
| Educational qualification of the study participants | | |
| Illiterate | 99 | 27.97 |
| Literate but below primary | 10 | 2.82 |
| Primary School | 59 | 16.67 |
| Middle School | 59 | 16.67 |
| High (or secondary) school | 81 | 22.88 |
| Higher Secondary | 39 | 11.02 |
| Graduate | 7 | 1.97 |
| Place of residence | | |
| Rural | 272 | 76.84 |
| Urban | 82 | 23.16 |
| Type of Family | | |
| Joint | 236 | 66.67 |
| Nuclear | 118 | 33.33 |
| Socio-Economic status | | |
| Class I | 28 | 7.91 |
| Class II | 43 | 12.15 |
| Class III | 127 | 35.88 |
| Class IV | 106 | 29.94 |
| Class V | 50 | 14.12 |

**Table 2: Distribution of study participants according to health care utilization.**

| Antenatal care availed | Number | Percentage |
|---|---|---|
| Yes | 339 | 95.76 |
| No | 15 | 4.24 |
| Number of antenatal care | | |
| No Visit | 15 | 4.24 |
| 1 to 3 Visit | 104 | 29.38 |
| ≥ 4 visit | 235 | 66.38 |
| Tetanus toxoid immunization | | |
| Complete | 318 | 89.83 |
| Incomplete | 36 | 10.17 |
| Number of iron and folic acid consumed | | |
| < 100 | 174 | 49.15 |
| ≥ 100 | 180 | 50.85 |
| Place of delivery | | |
| Hospital | 303 | 85.59 |
| Home | 51 | 14.41 |

**Table 3: Mean weight, Mean height and Mean body mass index of the study participants.**

| Variable | Mean ± S.D |
|---|---|
| Mean weight | 45.75 ± 8.66 kgs |
| Mean height | 147.79 ± 5.93 cms |
| Mean body mass index | 20.98 ± 3.82 kg/m2 |

**Table 4: Distribution of body mass index according to socio-.demographic profile**

| Characteristics | UnderweightNo. (%)n = 92 | NormalNo. (%)n = 202 | Overweight & Obese No. (%)N = 60 | Total | p-value |
|---|---|---|---|---|---|
| Age Group | | | | | |
| 15-19 | 10 (32.26) | 21(67.74) | 0 (0.00) | 31 | 0.001 |
| 20-29 | 74 (25.17) | 171 (58.16) | 49 (16.67) | 294 | |
| 30-39 | 8 (27.59) | 10 (34.48) | 11 (37.93) | 29 | |


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| | | | | | |
|---|---|---|---|---|---|
| Educational Qualification | | | | | |
| Below Primary | 49 (44.95) | 52 (47.71) | 8 (7.34) | 109 | 0.000 |
| Primary& middle School | 26 (22.03) | 72 (61.02) | 20 (16.95) | 118 | |
| High school | 12 (14.82) | 51 (62.96) | 18 (22.22) | 81 | |
| Higher secondary and above | 5 (10.87) | 27 (58.70) | 14 (30.43) | 46 | |
| Religion | | | | | |
| Hindu | 74 (25.26) | 176 (60.07) | 43 ( 14.67) | 293 | 0.011 |
| Muslim | 14 (26.42) | 25 (47.17) | 14 (26.41) | 53 | |
| Christian | 4 (50.00) | 1 (12.50) | 3 (37.50) | 8 | |
| Caste | | | | | |
| General | 23 (18.25) | 67 (53.17) | 36 (28.58) | 126 | 0.000 |
| Other Caste | 69 (30.26) | 135 (59.21) | 24 (10.53) | 228 | |
| Place of residence | | | | | |
| Rural | 88 (32.35) | 140 (51.47) | 44 (16.18) | 272 | 0.000 |
| Urban | 4 (4.88) | 62 (75.61) | 16 (19.51) | 82 | |
| Type of Family | | | | | |
| Nuclear Family | 34 (28.81) | 70(59.32) | 14 (11.87) | 118 | 0.184 |
| Joint Family | 58 (24.58) | 132(55.93) | 46 (19.49) | 236 | |
| Socio Economic Status | | | | | |
| Class I | 1 (3.57) | 18 (64.29) | 9 (32.14) | 28 | 0.000 |
| Class II | 5 (11.63) | 21 (48.84) | 17 (39.53) | 43 | |
| Class III | 36 (28.35) | 80 (62.99) | 11 (8.66) | 127 | |
| Class IV | 35 (33.02) | 59 (55.66) | 12 (11.32) | 106 | |
| Class V | 15 (30.00) | 24 (48.00) | 11(22.00) | 50 | |

*Percentages are calculated row-wise.

**Table 5: Body mass index of the study participantsaccording to their health care utilization.**

| Characteristics | UnderweightNo. (%)n = 92 | NormalNo. (%)n = 202 | Overweight & ObeseNo. (%)n = 60 | Total | p-value |
|---|---|---|---|---|---|
| ANC care availed | | | | | |
| Yes | 80 (23.60) | 199(58.70) | 60 (17.70) | 339 | 0.000 |
| No | 12 (80.00) | 3 (20.00) | 0 (0.00) | 15 | |
| Number of ANC Visit | | | | | |
| < 4 | 51 (42.86) | 56 (47.06) | 12 (10.08) | 119 | 0.000 |
| ≥4 | 41 (17.45) | 146 (62.13) | 48 (20.42) | 235 | |
| Number of IFA tablet consumed | | | | | |
| 0-100 | 65 (37.36) | 92 (52.87) | 17 (9.77) | 174 | 0.000 |
| ≥ 100 | 27 (15.00) | 110 (61.11) | 43 ( 23.89) | 180 | |
| Place of delivery | | | | | |
| Hospital | 71 (23.43) | 179 (59.08) | 53 ( 17.49) | 303 | 0.028 |
| Home | 21 (41.18) | 23 (45.10) | 7 (13.72) | 51 | |

*Percentages are calculated row-wise.

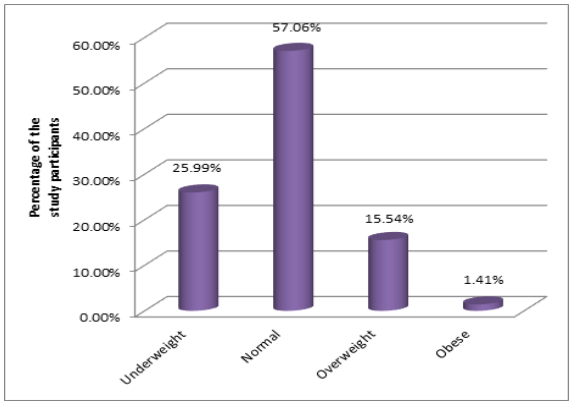


**Figure 1: Distribution Of study participants according to Body Mass Index**

## DISCUSSION

In our present study, lactating mothers in the age group of 15-19 years had higher (32.26%) prevalence of underweight than those of other age groups. In a similar study conducted by Alemayehu M, Argaw A and Mariam AG,[6] (2015) on lactating mothers in Ethiopia observed that the prevalence of underweight in the different age groups were 15-24 years (40.2%), 25-34 (41.4%) and 35-49 (40.5%). In a study conducted by Haileslassie K, Mudugeta A and Girma M.[7] (2013) on lactating mothers in Ethiopia observed that the prevalence of underweight was higher in the age group of 17-30 years (17.6%) as compared to 31-45 (7.9%). In our present study, the body mass index of the study participants was found to be significantly associated with age of the study participants which is different from the findings reported by Alemayehu M. Argaw A and Mariam AG,[6] (2015) and Haileslassie K, Mudugeta A and Girma M,[7] (2013) which is probably due to different study settings.

In our present study, the prevalence of underweight decreases with the improvement in the educational qualification. Alemayehu M, Argaw A and Mariam AG,[6] (2015) in their conducted on lactating mothers in Ethiopia observed that the prevalence of underweight was more in lactating women who cannot read (43%)and write as compared to the lactating women that can read and write (37.3%). In a similar study conducted by Haileslassie K, Mudugeta A and Girma M (7) (2013) it was


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observed that the prevalence of malnutrition was more in iliterate (14.2%)as compared to the literate (11.2%).In the present study the body mass index of the study participants was significantly associated with educational qualification of the study participants which is dissimilar to the study conducted by Alemayehu M, Argaw A and Mariam AG,[6] (2015)andHaileslassie K, Mudugeta A and Girma M,[7] (2013) which is probably due to different study settings.

In our present study, prevalence of underweight was more in rural areas (32.35%) as compared to the study participants residing in urban areas (4.88%). In a similar study conducted by Haileslassie K, Mudugeta A and Girma M,[7] (2013) it was observed that the prevalence of underweight was more in rural areas (13.2%) compared to the urban areas (12.2%). In the present study the body mass index of the study participants was significantly associated with the place of residence which is different from the study conducted by Haileslassie K, Mudugeta A and Girma M,[7] (2013) which is probably due to different study settings.

In our present study, the prevalence was more in the study participants belonging to nuclear family (28.81%) as compared to joint family (24.58%). However, there was no significant association observed. Hundera TD, Gemede HF and Wirtu D,[8] (2015)in their study observed that the prevalence of undernutrition was more in the family having > 7 family members (38.3%) as compared to lower family sizes. Haileslassie K, Mudugeta A and Girma M (7) (2013) in their study observed that the prevalence of underweight was more prevalent in the family having > 5 family members (14.5%) as compared to family having 2-4 family members (10.9%). However, no significant association was observed with body mass index.

In our present study, the prevalence of underweight was highest in the socio-economic class IV (33.02%) followed by socio-economic class V (30.00%).Hundera TD, Gemede HF and Wirtu D,[8] (2015) in their study observed that the prevalence of underweight decreases with the increase in the family income. In our present study, the body mass index of the study participats was significantly associated with socio-economic class which is similar to the study conducted by Hundera TD, Gemede HF and Wirtu D,[8](2015)In our present study, the prevalence of underweight was less among the study participants who had ≥ 4 visit (17.45%) as compared to < 4 visit (42.86%).In a similar study conducted by Alemayehu M, Argaw A and Mariam AG,[6] (2015) observed that the prevalence was more in the study participants who had < 4 ANC visit (45.8%) as compared to the study participants ≥ 4 ANC visit (40.00%). Haileslassie K, Mudugeta A and Girma M,[7] (2013) in their study observed that the prevalence of underweight was almost comparable in study participants having < 3 ANC visit (12.5%) with study participants having ≥ 3 ANC visit (12.2%). In our present study the body mass index was significantly associated with number of antenatal care visit which is dissimilar to the study conducted by Alemayehu M, Argaw A and Mariam AG,[6](2015) and similar to the study conducted by Haileslassie K, Mudugeta A and Girma M,[7] (2013) in their study conducted on lactating women in SamreWoreds, Ethiopia.

## CONCLUSION

The present findings uncovered information on the nutritional status and associated factors among lactating women in Dibrugarh district. From the findings of this present study, it is concluded that the adolescent group, lower educational qualification and lower socio-economic class had the highest rates of underweight. And, also religion, caste and health care utilization had significant influence on the mother's nutritional status.

There is a definite need to focus on the periodical and regular health check-up with concerted efforts toward the nutrition of adolescent mother's. Importance of delaying of age at 1st pregnancy should be conveyed through ASHA, AWW and ANM. Nutrition education is one of the key interventions for the women in the reproductive age groups starting from adolescent and continuing though pregnancy and after birth. Platform like Village Health Nutrition Days (VHND) and Village Health Nutrition & Sanitation committees (VHSNC) should be utilized by the Health Care Workers to impart the nutrition education. In the Health Facilities, Nutrition counselors should play a key role to provide the nutrition intervention. Locally available nutritious foods should be promoted in various platforms.

**Limitations**

The study could not be compared with any study in the similar settings as there was no study conducted with the similar study populations.

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