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Assessment of nutritional status of lactating women of flood- affected zone in Samastipur district of Bihar, India

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Abstract
Nutrients are transferred from maternal stores, due to which lactating women are more susceptible to nutrient deficiency. The aim of this study was to assess the nutritional status of lactating women (0-2 years) of flood- affected zone in Samastipur district of Bihar. A structured questionnaire was used to collect data on demographic profile, economic status, clinical assessment and dietary pattern. The data on dietary intake was taken by 24 hour recall method. The demographic profile indicated Most of the subjects were in the age group of 21-25 years, the highest level of education was upto matric and almost all women were homemaker. Mean height, weight and BMI of the subjects (Table 2) were 152.85±2.54 cm, 40.15±2.76 kg, and 17.18±0.97 kg/m^2 respectively. The mean daily intake (Table 5) of energy, protein, carbohydrates, ß-carotene, vitamin C, calcium and iron with adequacy of RDA was 1351.35±161.57 kcal (50%), 37.12±3.77 g (53%), 252.50±58.36 g (54%), 1087.54±1816.17 µg (19%), 34.76±6.09 mg (30%), 374±131.28 mg (31%) and 11.56±2.12 mg (50%), respectively. On analysis, women having 3 meals in a day and their dietary intake of all nutrients was less as per the recommended dietary allowances. It was concluded that they were not having proper food to maintain their health and nutritional status.

Keywords: Lactating women, nutritional status, body mass index, dietary intake

Introduction
Glands that helps breast to secrete milk is known as mammary glands. These glands are already present at birth, but only during pregnancy they become completely ready for milk formation. Multiple hormones are the responsible for the progression of mammary gland as well as for the induction and management of lactation process. The pituitary gland in the brain produces the most important of these hormones, prolactin and oxytocin. Prolactin modulates the final growth of the mammary glands during pregnancy, along with other hormones such as oestrogen and progesterone. (Lawrence and Lawrence, 2005) [7]. Breastfeeding interventions do not have to be expensive or complicated to be effective, and a good program can have a significant effect on the well-being of both mothers and their children. (Clark and Bungum, 2003) [2]. Nursing improves sentimental relationship between mother and baby and makes a significant contribution to achieve the optimum short and long-term health outcomes for both. According to statistics, baby who is not breastfed seems to have more demands for health care than a breastfed baby. (Riordan, 1997) [9]. Requirement of energy during lactation is evaluated by the woman's basal metabolic rate (BMI), age, activity, the amount of breast milk, as well as other aspects. Whereas calories are required for milk formation, the mother does not have to eat massively more than she did earlier to pregnancy in terms of maintaining milk formation. (Riordan, 2005) [8]. Nutrients are transferred from maternal stores, due to which lactating women are more susceptible to nutrient deficiency. (Food and Nutrition Board, 1991) [4].

During lactation, diets are deficient in nutrients that are essential for lactating women to maintain their health status can increase the risk of particular nutrient deficiencies. Breast milk output and nutrient content have been linked to high calorie consumption. Calorie deficiency for long term can also have an impact on breast milk production and quality, tends to result in infant malnourishment. (Wang *et al*., 2021) [12]. Inadequate nutrient intake causes lower body weight, poor weight gain during pregnancy, and low birth weight (LBW) infants. (Berhe *et al*., 2021) [1].

According to various studies, the nutritional status of a new-born is mostly influenced by the mother's dietary patterns and dietary intake. Nursing mothers in poor Indian communities, frequently eat *chawal* or *roti* with a few pulses and vegetables. Milk is only added in tea or coffee instead of consuming whole milk (Kumari, 2015) [6].

To minimize nutrient loss and maintenance of health and wellbeing, lactating women should be advised to eat foods high in calcium, vitamin A, vitamin B1 (thiamine), vitamin B2 (riboflavin), vitamin B6, B12, folate, and iodine. (Food and Nutrition Board, 1991) [4]. Quality of maternal diet during pregnancy and lactation is found to be inversely related to relative weight of baby and fat storage in the early postnatal period. (Tahir *et al.*, 2019) [11].

Bihar is one of India's most flood-prone states, residing with the continuous warnings of flood damage. The plains of north Bihar, undergo the most floods in the last thirty years. Bihar experienced severe flooding in 1978, 1987, 1998, 2004, and 2007 (FMISC, Bihar) [3]. That is why usually there is a flood in north Bihar and Samastipur district also comes under these areas and faces general problems due to floods. Therefore, this study was conducted to assess the nutritional profile of lactating women.

Materials and methods

This study was conducted on randomly selected 80 lactating women (0-2 years) from flood- affected zone, Tira village in Jatmalpur panchayat under Kalyanpur block of Samastipur district in Bihar for assessing their nutritional status. Lactating women were monitored for anthropometric measurement, clinical analysis and dietary pattern using 24 hours dietary recall method. The questionnaire covered demographic information of the subjects, these are age, occupation, qualification, economic status, clinical assessment were observed and recorded. Anthropometric parameters included height and weight. The data was then further used to compute body mass index (BMI). Dietary survey was done by 24 hour dietary recall method in which subjects were asked about approximate amount of foods eaten during the previous day at each meal and between meals.

Results

Present study was conducted to assess the nutritional status of lactating women (0-2 years). Most of the subjects (57%) were in the age group of 21-25 years (Table 1). The highest level of education attained by the subjects was upto matric i.e. 40 per cent. Only 3 Per cent subjects was working to earn money and rest of the 97 per cent subjects was homemaker. About half of the subjects (54%) was possessing family's monthly income 'low' and on the other hand, very few of the subjects (4%) was possessing family's monthly income 'High'.

Mean height, weight and BMI of the subjects (Table 2) were 152.85±2.54 cm, 40.15±2.76 kg, and 17.18±0.97 kg/m^2 respectively. Most of the women (Table 3) were having chronic energy deficiency- grade I mild (17.0-18.5) and very few were in the low weigh- normal range of BMI ((18.5-20.0). Most of the women (Table 4) were non-vegetarian. The mean daily intake (Table 5) of energy, protein, carbohydrates, ß-carotene, vitamin C, calcium and iron with adequacy of RDA was 1351.35±161.57kcal (50%), 37.12±3.77 g (53%), 252.50±58.36 g (54%), 1087.54±1816.17 µg (19%), 34.76±6.09 mg (30%), 374±131.28 mg (31%) and 11.56±2.12 mg (50%), respectively.

Table 1: Demographic Information of the subjects

Particularities	Subjects (n=40)	
	Frequency (f)	Percentage (%)
Age		
≤20 years	15	19
21-25 years	46	57
26-30 years	19	24
Qualification		
Illiterate	18	23
Up to primary	16	20
Up to matric	32	40
Up to intermediate	9	11
Graduation	5	6
Religion		
Hindu	76	95
Muslim	4	5
Caste		
General	-	-
OBC	51	64
SC	29	36
Family type		
Joint	45	56
Nuclear	35	44
Family Size		
≤3 members	13	16
4-6 members	42	53
7-9 members	21	26
≥10 members	4	5
Occupation		
Working	2	3
Homemaker	78	97
Family's monthly income		
≤ 10,000 Rs. (Very Low)	34	42
10,000- 20,000 Rs. (Low)	43	54
20,000- 30,000 Rs. (High)	3	4

Table 2: Mean anthropometric measurements of the subjects

Matrices	Subjects (n=80)
Height (cm)	152.85±2.54
Weight (kg)	40.15±2.76
BMI (kg/m^2)	17.18±0.97

Table 3: Body Mass Index (BMI) of the subjects

BMI (kg/m^2) Categories	Subjects (n=80)	
	Frequency (f)	Percentage (%)
Chronic energy deficiency- grade III severe (≤16.0)	5	6
Chronic energy deficiency- grade II moderate (16.0-17.0)	29	36
Chronic energy deficiency- grade I mild (17.0-18.5)	39	49
Low weight-normal (18.5-20.0)	7	9
Normal (20.0-23.0)	-	-
Overweight (>23)	-	-
Obese (>25)	-	-

Source: B. Srilakshmi, 2018) [10].

Table 4: Dietary habits of the subjects

Particularities	Subjects (n=80)	
	Frequency (f)	Percentage (%)
Food habit		
Vegetarian	27	34
Non-vegetarian	53	66
No. of meals having in a day		
2 meals	29	36
3 meals	51	64

Table 5: Mean dietary intake of the subjects

Nutrient	RDA (ICMR-2020) [5]	Subjects (n=80)	
		Mean±SD	% Adequacy
Energy (kcal)	a=2130+600 b=2130+520***	1351.35±161.57	50
Protein (g)	a= 46+17 b= 46+13	37.12±3.77	53
Total Fat (g)	30	20.88±2.19	70
Carbohydrate (g)	70% of TE**	252.50±58.36	54
ß-carotene (µg)	5700	1087.54±1816.17	19
Vitamin C (mg)	115	34.76±6.09	30
Calcium (mg)	1200	374±131.28	31
Iron (mg)	23	11.56±2.12	50
a= 0-6 Months b= 7-12 Months *** a and b values are as per EAR (Estimated Average Requirement) by ICMR- 2020 **based on 70 % of total energy from carbohydrates			

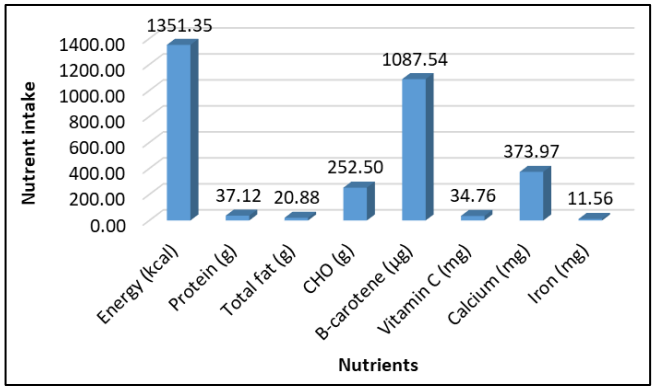

Fig 1: Mean dietary Intake of nutrients of the subjects

Conclusion

To sum up, very less of women received education upto intermediate and graduation. Almost all women was homemaker and very few of them was working women (working to earn money). Most of the women were belonged to joint family, their family's monthly income was also 'low' and 'very low', very few of them were having 'high' family's monthly income. Food habits of the women were non-vegetarian and having 3 meals in a day. Their dietary intake of all nutrients was less as per the recommended dietary allowances because they were not eating food properly.

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