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The Effect of Physiological State on the Nutritional Status of Women

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The effect of the physiological state such as pregnancy, lactation or NPL state on the nutritional status of women is evaluated. The study comprised of 726 Andhra women from low to middle income groups. The nutritional status of women was studied by anthropometry, dietary and clinical methods. The results indicate that the women in state of lactation are too burdened during which their body measurements showed lower values, the dietary intakes were only 50% adequate and the incidence of nutritional deficiencies is also high as indicated by high mean nutritional deficiency scores. Among lactating women the women experiencing amenorrhoea are worse as indicated by all these parameters. There is an urgent felt need to improve the dietary intakes of lactating women through proper nutritional counselling.

The nutritional status of an individual is the end result of many factors, which operate in any situation, because all the factors inevitably influence the food consumption, which is the basic necessity of life and thereby effect the nutritional status.

The physiological condition of women influence the nutritional status, because most Indian mothers are pregnant too frequently, malnourished, anaemic and dying of causes which could have been easily prevented. In addition, in our society, the cultural norms and practices and socio-economic situation determine the nutritional status of a family and the women. The present paper is attempted to assess the effect of physiological state on the nutritional status of women, and to identify the factors that influence nutritional status through physiological state.

Material and Methods

The sample consisted of 726 Andhra women aged 15 to 45 years, married and having living children.The sample representing the low to middle income groups of Visakhapatnam city were chosen by stratified random sampling (Busi, 1989)[3]. The

women thus selected were classified according to their physiological state into pregnant, lactating and non-pregnant non-lactating (NPNL) women.

The anthropometric, dietary and clinical assessment of nutritional deficiency diseases were the various indicators used to assess the nutritional status. Besides, the cultural practices which were observed to be affecting the nutritional status were elicited. Four anthropometric measurements namely height, weight, arm circumference and triceps skinfold were taken (Weiner and Lowrie, 1969)[14], individual dietary intake was evaluated based on the 24- hour recall method of diet survey (Thimmayamma and Parvathi Rau, 1983)[12] and the checklist proposed by Jelliffe (1966)[4] for assessing the nutritional status by clinical method was followed. To study the cultural practices, the food habits such as special foods taken and food avoidances or restrictions during pregnancy and lactation were noted.

Results

It can be seen from Table I, which the height of women in general ranges from 149 to 151 cm. The weight of the women by different physiological state showed that lactating women had lower weights than the pregnant and NPNL women. The weight of NPNL women was high and equal to that of pregnant women. The differences between pregnant and NPNL women was statistically significant for arm circumference and TSF only, whereas differences between NPNL and lactating women was significant for all the measurements. Among the lactating women the women who are in the amenorrhoeal state showed lower values than those not experiencing amenorrhoea, however the differences are not statistically significant. A negative correlation, which was highly significant, was observed between lactational amenorrhoea and body weight as shown in Table II.

Table I.: Mean and S.D. of body measurements by physiological status (PS)

	Height (cm)	**Weight (kg)**	**Arm Circ (cm)**	**Triceps Skinfold (mm)**
PS				
a) Pregnant (37)	149 ± 5.90	48.4 ± 7.75	22.2 ± 2.21	10.9 ± 3.85
b) Lactating (183)	149.1 ± 5.81	41.9 ± 6.41	21.5 ± 2.17	10.1 ± 4.19
c) NPNL (505)	150.7 ± 5.59	48.5 ± 10.37	23.6 ± 3.22	14.1 ± 6.09

Intergroup (a&b)	0.10	5.43 **	1.78	1.07
Variation (t) a & c	1.78	0.06	2.60**	3.15**
b & c	3.29 **	8.09 **	8.19*	8.23*
LACTATING				
a) Amenorrhoeal (77)	149.4 ± 6.06	41.8 ± 5.61	21.3 ± 1.66	9.5 ± 3.11
b) Non- amenorrhoeal 106	148.9 ± 5.64	42.0 ± 6.94	21.6 ± 2.36	10.6 ± 4.78
Intergroup variation (t) a&b	0.57	0.21	0.93	1.77

** $p < 0.01$

Table II.: Correlation coefficient of lactational amenorrhoea with weight

Variable	**'r'(n=77)**	**s.e**	**t**
Lactational amenorrhoea vs weight	-0.442	0.1	4.27**

** ($p > 0.01$)

It can be seen from Table III the nutrient intake of lactating women was less than that of pregnant and NPNL women, except for energy and Vitamin C intakes. The energy intake of lactating and NPNL women was nearly similar and higher than that of the pregnant women. However the dietary intakes of all nutrients by the women in all physiological states was less than the recommended. The calcium intake was particularly low among pregnant and lactating women. The differences in calcium intake alone were significant between the three groups. By amenorrhoreal status also, it was observed that the women in amenorrhoea had lower dietary intakes thanthose not experiencing amenorrhoea Table IV

TableIII.: Nutrient intake (Mean ± S.E) by physiological status

Nutrients	Physiological Status			
	Pregnant (25)	**Lactating (126)**	**Non-pregnant,Non-lactating (243)**	**"F" ratio (2/391)**
Energy (K.cal)	1396.0 ± 76.6	1447.0 ± 36.5	1445.0 ± 27.0	0.15
Protein (g)	39.1 ± 3.4	35.1 ± 1.1	36.6 ± 1.0	1.01
Calcium (mg)	277.9 ± 49.2	274.7 ± 17.1	364.6 ± 15.8	6.84**
Iron (mg)	14.0 ± 1.5	13.0 ± 0.4	14.1 ± 0.5	1.19
Retinol (ug)	357.8 ± 145.2	203.6 ± 29.5	318.3 ± 39.4	2.02
Thiamine (mg)	0.4 ± 0.05	0.4 ± 0.02	0.5 ± 0.02	0.42
Riboflavin (mg)	0.5 ± 0.1	0.5 ± 0.02	0.6 ± 0.02	0.46
Niacin (mg)	7.7 ± 0.6	7.7 ± 0.3	7.4 ± 0.2	0.08
Vit. C (mg)	25.8 ± 7.6	31. 6 ± 4.2	38.9 ± 3.0	1.79

** $p < 0.01$

TableIV.: Comparison of dietary intakes (Mean ± S.E.) of women categorised by amenorrhoeal status

	Amenorrhoeal (55)	**Non-amenorrhoeal**	**T-value (127)**
Energy (K.cal)	1443.0 ± 68.09	1502.0 ± 52.82	0.69
Protein (g)	33.6 ± 1.60	36.7 ± 1.61	1.35
Calcium (mg)	262.5 ± 26.73	297.6 ± 24.75	0.95
Iron (mg)	12. 1 ± 0.55	13.8 ± 0.64	1.92
Retinol (ug)	181.9 ± 37.23	221.6 ± 41.89	0.68
Thiamine (mg)	0.39 ± 0.02	0.44 ± 0.02	1.18
Riboflavin (mg)	0.44 ± 0.03	0.49 ± 0.03	1.72
Niacin (mg)	7.5 ± 0.39	7.8 ± 0.42	0.57

Vit. C (mg)	2.82 ± 3.96	35.7 ± 6.56	0.90

The mean adequacies of energy and protein showed TableV that the diets of lactating women were about 50% adequate for both energy and proteins. The intakes of pregnant and NPNL women were more adequate

TableV.: Mean adequacy (%) and S.E. of energy and protein

Physiological state	**Energy**	**Protein**
Pregnant (25)	56.0 ± 3.0	65.0 ± 5.6
Lactating (126)	55.0 ± 1.3	50.0 ± 1.6
NPNL (243)	66.0 ± 1.2	81.0 ± 2.1
'F' (2/391)	0.43	0.67

The adequacy calculated on the basis of a cut - off level based on mean S.D of RDA showed that the inadequacy of both energy and protein was prevalent in higher percent of lactating women and the adequacy of only energy was seen in small percent of lactating women. In general the adequacy of both the nutrients was high in NPNL women (Fig. 1 is missing).

An evaluation of nutrition deficiency symptoms showed a higher incidence of anaemia (81%) and angular stomatitis (6%) in the women of all physiological states. The presence of nutritional deficiency symptoms were even weightage and mean scores were estimated TableVI. The lactating women had higher mean scores (0.99) and NPNL women the lowest (0.84). The mean scores of women in amenorrhoeal period was higher than those without amenorrhoea.

TableVI.: Mean nutritional deficiency scores

Condition	**Mean score**
Pregnant	0.97

Lactating	0.99
Non-pregnant Non-lactating (NPNL)	0.84
Amenorrhoeal	1.06
Non-amenorrhoeal	0.94

To understand the various factors that operate in degrading the nutritional status of women, especially the pregnant and lactating women, the cultural practices were studied. The food habits of women during pregnancy and lactation not only affect their nutritional status, but also throw a light on the cultural beliefs and practices and indicate the level of ignorance prevalent in these women. About 15% of women took special foods during pregnancy while 7% took during lactation. However food restrictions were followed by 75% only during lactation as shown in TableVII.

It can be seen fromTableVIII that food practices during pregnancy and lactation also influence the phenomenon of post partum amenorrhoea in lactating women. The women with lactational amenorrhoea took special diets during pregnancy and lactation in lower percent while the food restrictions in the latter group was high.

TableVII.: Dietary during pregnancy and lactation

Category	**Pregnancy (%)**	**Lactation (%)**
Special foods taken	15.7	6.8
Foods avoided	-	74.6

TableVIII.: Post partum amenorrhoea and dietary habits

	Special diet taken during		**Food avoidances during lactation**
	Pregnancy	**Lactation**	
Amenorrhoea (%)	14.3	10.4	79.2
No amenorrhoea	22.6	10.4	73.6

Discussion

The better nutritional status observed by NPNL women is attributed, the lesser physical stress and strain faced in the state. The lower values of body measurements shown by lactating women indicate the strain borne by these women both physically and physiologically is high, while their diet intakes are lower than that of NPNL women. Several studies reported low values of body weights for lactating women (Prema et al.,1981 and Adair1992)[8 ,1] reported a BMI value lower than 1.85 for Filipino women at 24 months post partum indicating chronic energy deficiency. It is normally the lactating women who has to bear the brunt of the ill-effects of the strain during pregnancy coupled with daily household chores (Sai Leela, 1992)[10] along with the enormous energy expenditure demanded by lactation (Venkatachalam and Rebello, 1983)[13].

So due to the higher energy expenditure and lower dietary intakes, there may be a greater loss of body muscle mass and fat resulting in lower values of the body measurements.

The poor nutritional status of lactating women observed from anthropometric and dietary evaluation is also indicated in the higher nutritional deficiency scores. Prema (1989)[7] reported an increase in B-complex deficiency in pregnant women with increasing gestational period and in lactating women with increasing period in lactation and vice-versa.

Among the lactating women, those experiencing amenorrhoea were observed to be worse than those who resumed menstrual cycle, as has been observed by all the parameters. The differences, however, are not significant between the two groups which may be due to the wide range of the period of amenorrhoea observed in the present sample. The lower body measurements, lower dietary intakes and higher mean deficiency scores in amenorrhoeal women clearly indicate the state of post-partum amenorrhoea as a function of poor nutritional status of women. Prema et al.(1981)[9] in a study of low-income lactating women observed the effect of maternal nutritional status on duration of lactational amenorrhoea.

Of the various factors, which influenced the nutritional status of women, the dietary habits especially during the two crucial periods of life, pregnancy and lactation are important. The women, who felt the need for special foods to maintain good health, took extra care, in the diet during pregnancy.

The special foods that were taken include fruits, milk, etc rich in vitamins and proteins and other foods such as horlicks, breads, etc. The higher use of special foods during pregnancy than during lactation is an indication that the women attached much importance to the period of pregnancy than during lactation. Several studies such as one from Hyderabad (Surekha, 1984)[11], rural Rajasthan (Pendse and Giri, 1989)[6], confirm these findings. Ignorance of women, poverty, non-availability of foods and wrong beliefs determined the dietary practices. The food taboos included many nutritious foods such as fish, chicken, mutton, eggs, potato, ridge gourd, dhal, brinjal, drumstick, coconut, ash gourd, bottle gourd, etc. This practice has been so deep-rooted that some of the mothers who could not perform breast-feeding were also following it. However no such avoidances were observed during pregnancy.

The special dietary habits during pregnancy and lactation were observed to lower the incidence of lactational amenorrhoea. The cultural practices in the form of food avoidances and the low dietary intakes are observed to have a strong influence on this post-partum phenomenon in women. However a study from Zaire (Aunger, 1991)[2] reported no maladaptive nutritional effects of food taboos. Studying the relationship between the cultural practices and the incidence of post-partum amenorrhoea is relatively new and the results are quiet encouraging. Further research need to be carried out in this direction where there appears to be a lacuna as pointed out by the National Academy of Sciences (1983)[5] that little "solid research addresses the impact of cultural food restrictions or dietary changes in general on the health and nutritional status of lactating women."

Summary and Conclusion

It can be inferred from the results that the nutritional status of women is influenced by their physiological status. Among the various physiological states the period of lactation seem to be the most burdening and hence affecting the nutritional status, as observed by all parameters. Among lactating women those experiencing post-partum amenorrhoea are the worst affected. The dietary habits during pregnancy and lactation are observed to exert a profound influence on the incidence and length of post-partum amenorrhoea.

There is an urgent need to overcome the cultural practices that are traditionally affecting the nutritional and health status of women. The higher use of cheap and easy sources of energy should be advocated to improve the dietary energy intake of lactating women.

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