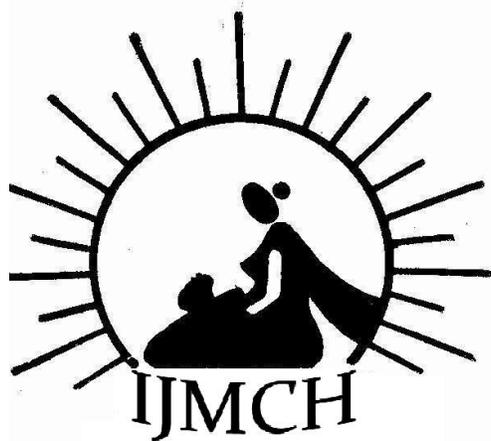


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Nutritional Status among Lactating Women and predictors for infant weight gain in Rural Area of Wardha

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Abstract:

Research Question: To find out the nutritional status of lactating women in rural area of Wardha and predictors for infant weight gain. *Setting:* Present study was carried out in 54 randomly selected villages of 27 PHCs in Wardha district. *Study design:* Present longitudinal study was carried out from Dec.2010 to march 2011. *Participants:* All lactating women with successful outcome and willing to participate were enrolled. *Methodology:* we randomly selected two villages from 27 PHCs of Wardha district. Then all lactating women with successful outcome were enrolled and followed for 4 months. Predesigned pretested questionnaire was administered to the Lactating women. Monthly anthropometric measurement was done and Haemoglobin level was checked. *Results:* Chronic energy deficiency was seen in nearly 38.5% of women and nutritional anemia was found to be 70.3% among the participants which is higher than pregnant and adolescent age group.

Introduction:

Dietary practices of lactating women may have a significant effect on the well being of mothers and infants. In fact, the proportion of ingested nutrients partitioned for milk biosynthesis may depend on maternal nutrient stores. These stores may be mobilized to contribute to the nutrient availability for milk biosynthesis and it is likely that the extent of nutrient mobilization is conditioned upon dietary intake¹.

Consideration should be given to the fact that two of the major factors that contribute to the nutritional status of the exclusively breastfed infant are nutrient stores, especially those accumulated in utero, and the amount and bio-availability of nutrients supplied by human milk². A mature milk flow of 850ml represent a net energy loss of about 600kcal daily which must be balanced by the energy intake or subsidized from the body stores. And if the energy requirements during lactation are not met women loses her weight³. Nutritional recommendations state that women who are breastfeeding should increase their energy and nutrient intakes to levels above those of non pregnant, non lactating women⁴⁻⁶.

NFHS 3(05-06) showed the prevalence of anemia among lactating mothers about 63.2% as compared to pregnant women and other women as 58.7% and 53.2% respectively⁷. Similarly Agrawal et al in the nationwide study including seven EAG states has showed alarmingly high prevalence of Anemia of 92.2% among lactating women and 84% among pregnant women⁸.

Maternal nutrition during pregnancy and lactation plays an important role on the overall health of the infant and in the adulthood. These figures show that the condition is much severe in lactating women as compare to pregnant women, even when she has to nurture

the child. There are scanty evidences showing the nutritional status of lactating women. Hence present study was planned with following objectives.

Objectives:

1. To find out the nutritional status of lactating women in rural area of Wardha.
2. To identify the predictors of infant weight gain.

Material and Methods:

Present longitudinal study was carried out in the rural area of Wardha district (Zillah). From 27 Primary Health centers in the Districts we randomly selected 2 villages from the each PHC. The list of Lactating women (15-49) years was obtained from the local ANM (Auxillary Nurse Midwife) and AWW (Anganwadi Worker). Written informed consent was obtained from pregnant women after being ready for being part of the study and follow up. Institutional ethical committee clearance was obtained before start of the study. Participants were followed regularly upto 4 Months from Dec.2010 to March 2011. Predesigned pretested questionnaire was administered to the Lactating women. Questionnaire included socio-demographic characteristics; economic status was assessed by the ration card issued by the government PDS system. Obstetric history and delivery details were obtained. Those mothers having any pregnancy loss viz. abortions, still births were not included in the analysis.

Monthly weight and height of all mothers was measured along with laboratory investigation for hemoglobin level. Infant weight was also measured in each visit and screened for any danger signs. Any child found to be suffering from sickness was referred to primary health center. During each visit health education was given regarding dietary practices, breastfeeding, infant care and family planning. Weight was measured using bathroom scale with minimum clothing after correcting zero error. The weight was recorded to the nearest 0.1kg. The height was measured keeping the women standing on level ground, without footwear, against a wall, by using measuring tape to the nearest of 0.5 cm. BMI of the participant was calculated and classified as per the classification for Asians⁹. Hemoglobin estimation was done by Salhi's¹⁰ method. Anemia was classified for lactating women as per WHO criteria¹¹. Infant weight recorded within 24 hours of the delivery was taken as Birth weight in the study.

Statistical Analysis:

Data collected and entered Epi Info software and analyzed. Descriptive analysis was done with the help of Univariate analysis to compute frequencies, mean and standard deviation. After verifying normality assumptions, a forward purposeful selection method was used to build a multiple linear regression model containing all significant predictors of infant weight gain as continuous variable. Specifically, variables were added to model in order of p-value significant and their continued statistical significance evaluated using F-test.

Results:

After careful evaluation 289 complete records were analyzed. Mean age of pregnancy was found to be 23.8 Years (± 2.8). Age wise distribution showed 58.5% of the women were in the age group of 20-24 years followed by 25-29 years. Chronic energy deficiency was seen in nearly 38.5% of women out of which 3.5 % had chronic energy deficiency grade III. Anemia was found to be 70.3% (Table 1).

Table I: Characteristics of the Study Participants

Variables		Frequencies (%)
Age-Wise Distribution	<20 Years	01(0.3%)
	20-24	169(58.5%)
	25-29	111(38.4%)
	30-35	08(2.8%)
Total Live Births	1	67 (23.2%)
	2-3	216(74.7%)
	>4	06(2.1%)
Birth Interval	<18 Months	34(15.1%)
	18-24 Months	42(18.9%)
	25-36 Months	88(39.6%)
Place of delivery	Home	13(4.5%)
	Institutional	276(95.5%)
Type of delivery	Vaginal	248(85.8%)
	Cesarean	38(13.1%)
	Vaccum/ Forceps Assisted	03(1.0%)
Ratio Card	>36 Months	52(26.4%)
	BPL	76(26.3%)
	APL	163(56.4%)
	Don't Have	40(13.8%)
BMI Classification	>16.0 (CED III)	11(3.8%)
	16.00-16.99 (CED(II))	40(13.9%)
	17.0-18.49(CEDI)	60(20.8%)
	18.5-22.99	155(53.8%)
	>23.00	22(7.6%)
Hemoglobin	<7gm% (Severe)	1(0.3%)
	7-10.9 gm% (Mild- Moderate)	211(73.0%)
	>11.0 gm%	77(26.6%)

74.7% of the mothers already had at least one live birth. Mean time interval since last pregnancy was 11.9 (± 19.6) and nearly 15.1% of them had pregnancy within last 16 months. 9.3 % of the pregnancies were associated with at least one high risk factor. Out of all deliveries 2.1% had complication during pregnancy and 1.7% had excessive bleeding during delivery. Birth weight less than 2500 grams was found among 10% of all live births (Table I) Mean birth weight among children was found to be 2.699 (± 0.31) which doubled at the age of 3-4 months.

Linear regression model was prepared keeping baby weight gain as dependent variable (Table II). Age of pregnancy, baby birth weight, BMI of mother and Hb status were positively correlated with the baby weight gain where age at pregnancy was found to be significant variable. Whereas total births and time interval since last birth was found to be negatively correlated and total no of births was found to be significant ($p < 0.05$).

Table II: Linear Regression Model showing Correlation with Infant Weight Gain

Variable	Unstandardized Coefficient		Standardized Coefficients	t	p value
	B	Std Error			
Age of Mother	0.43	0.33	0.084	1.312	0.191
Total Live Births	-.240	0.084	-.195	-2.86	0.005
Time Interval	-.006	0.005	-.090	-1.23	0.217
Birth Weight	0.586	0.241	0.144	2.431	0.016
Hb Status of Mother	0.010	0.080	0.007	0.128	0.899
BMI of Mother	0.018	0.030	0.035	0.585	0.599

Discussion:

Infant survival depends on the birth weight and subsequent weight gain after the birth. In present study lactating women were followed for the 4 months after the child birth. We assessed nutritional status of mother, identified the high risk factors associated during pregnancy, complications during pregnancy and prevalence of low birth weight. We also tried to develop the linear correlation model for prediction of baby weight gain after birth. In present study the mean age at the pregnancy was found to be 23.8 years (± 2.4) and majorities (58%) of the women were in the age group of 20-24 years. Khoushabi et al identified the same distribution in his study where mean age of the pregnant women were 24 years (± 4.2) and majority of them were in the age group of 21-23 years¹². Overall chronic energy deficiency was found to be 38.5% which is similar to the Rao et al finding from rural part of nine states of the country¹³. Prevalence of iron deficiency was seen in 73.3% of lactating mothers which is comparable to NNMB findings where they observed highest prevalence of anemia among lactating women (78%) followed by pregnant and adolescents¹⁴.

Present study showed the incidence of high risk factor during pregnancy was associated with 9.3% of the pregnancies which is comparable with Samiya et al (15%)¹⁵. We observed nearly 15.1% children were born within 18 months of the last births which is similar to the NFHS-3 Findings for Maharashtra where 15% had birth interval less than 18 months. (NFHS-3)

This study observed that 10% of the infants were having birth weight less than 2500 grams which is lower than NFHS-3(05-06) observations for Maharashtra. This might be because of the reporting percentage of birth weight in the NFHS-3 at national level was less than 30% and along with much of the awareness brought by health functionaries over period of 5 years after the survey in the study area⁷.

While study we also observed the doubling time of birth weight was in between 3-4 months which is similar to observations produced by Neumann et al¹⁶.

In our study we found the positive correlation of mean weight gain among infants with the age, BMI, Hb status of mother and birth weight of the baby. Out of which it was significantly

correlated with birth weight. Ebina et al while studying the infant weight gain in first few months of life found correlation with infant gender, birth weight, birth height, and maternal age¹⁷. Present study also found infant weight gain negatively correlated with the total no of live births and time Interval since last Pregnancy out of which found to be significantly associated with total no of live births a mother having in her reproductive age group.

Conclusion:

Maternal Nutrition is still in the grave condition with high level of chronic energy deficiency and anemia. Present study demands impetus on the family level nutritional educational intervention. We observed small family size as a predictor for infant weight gain hence there is need of focus over family size containment and fulfilling unmet need of contraception.

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