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## Assessment of nutritional status of pregnant and lactating women attending ICDS Anganwadi centres (AWC) in rural areas of Medak district

**E Jayasheela and Varsha Peram**

### Abstract

ICDS services targeted towards pregnant and lactating women are significantly playing a pivotal role in rural areas to promote the health and nutritional status of Pregnant, lactating women and children (below 5 years). The objective of the study was to assess the nutritional status of Pregnant and Lactating women. A cross sectional community-based survey was conducted in Medak district, data was collected from 16 Anganwadi centres, 1 Primary health Care centre, and Medak Area Hospital. The subjects (n=300; Pregnant (150) and Lactating women (150)) were interviewed with a structured questionnaire. Information regarding age, demographic details, anthropometric measurements, physical activity, nutritional information, nutrition knowledge, utilization of ICDS services, and 24-hour dietary recall was collected. Results reveal that in spite of supplementation with Iron & Folic acid, Haemoglobin levels of a majority of Pregnant women (93%) were found to be moderately anaemic, whereas 7% are mildly anaemic. On application of Pearson's coefficient of correlation, it was found that Iron intake had a weak positive correlation with respect to Haemoglobin, where  $r=0.201$ . The prevalence of Low birth weight infants in rural areas is significantly low (11%). The mean BMI was found to be  $18.51 \pm 3.45 \text{ kg/m}^2$  and  $20.27 \pm 2.88 \text{ kg/m}^2$  in pregnant and lactating women respectively. The mean intake of Energy, Protein, Folate, Iron and Calcium of Pregnant women is  $1268.4 \pm 212.6 \text{ Kcal}$ ,  $46.20 \pm 11.09 \text{ g}$ ,  $230.2 \pm 98.9 \mu\text{g}$ ,  $8.97 \pm 7.72 \text{ mg}$ ,  $514 \pm 208 \text{ mg}$  respectively. The mean intake of energy, protein, folate, iron and calcium of lactating women is  $1374 \pm 192 \text{ Kcal}$ ,  $50.3 \pm 9.7 \text{ g}$ ,  $274 \pm 84.02 \mu\text{g}$ ,  $10.89 \pm 5.19 \text{ mg}$ ,  $611.6 \pm 190 \text{ mg}$  respectively. From the study it can be concluded that the nutrient intake of ICDS beneficiaries was marginally inadequate when compared to RDA. The Supplementary nutrition provided by ICDS Anganwadi centres (AWC) to pregnant and lactating women is directed in fulfilling the deficiencies of Calories, Proteins, Vitamins and minerals. The role of ICDS in imparting nutrition knowledge is found to be beneficial in pregnant and lactating women. It is commendable that ICDS workers are contributing to educate the rural women through Nutrition Health and Education component, but Supplementary Nutrition Program needs to be improved to enhance their nutritional status. Thus, from the study it is evident that rural women are aware of ICDS services and their utilization is found to be significant in both pregnant and lactating women.

**Keywords:** Pregnant and lactating women, ICDS services, nutritional status, Anganwadi centres

### Introduction

Pregnant women form one of the most vulnerable segments of the population from nutritional point of view <sup>[1]</sup>. Nutritional problems have serious public health significance impacting psychological, physical, developmental, behavioural and work performance of pregnant women. Iron deficiency is by far the commonest nutritional cause of anaemia. It may be associated with folate deficiency, especially during pregnancy. Pregnant women form a large high-risk group requiring special care <sup>[2]</sup>. Lactating mothers have been widely recognized as a vulnerable group from health point of view. They need more healthy food than normal person, because secretion of milk, the quality and quantity of which depends upon maternal diet <sup>[3]</sup>. Due to nursing process mothers are subjected to nutritional stresses. Frequent pregnancies followed by lactation increase the health risk of mothers resulting in a high maternal mortality <sup>[4]</sup>.

In a developing country like India, nutritional status is directly related to several factors including; levels of education, standard of living and social status. Thus, it could be said that over nutrition is widely prevalent among high socio-economic status and under nutrition

among low income category [5]. Numerous studies in India and elsewhere have shown that in chronically undernourished women subsisting on unchanged dietary intake in pregnancy and lactation have an adverse effect on maternal nutritional status. Over 75% of pregnant women in India are anaemic and anaemia remains to be a major factor responsible for maternal morbidity, mortality and low birth weight [1].

In the process to improve child and maternal health, especially to provide supplementary nutrition and healthcare to children and their mothers, Indian government initiated the world's largest ICDS through community level Anganwadi centres [6]. ICDS provides health, nutrition, immunization, preschool education, health and nutrition education, and referral services to young children and their mothers. ICDS also empowers mothers to take better care of their children [2]. Supplementary nutrition provided through Anganwadi centres is very helpful to fight against malnutrition and its complications [7]. Failure to meet the nutritional requirements of pregnant women will have a bearing on maternal nutrition as well as on the outcome of pregnancy [8]. The Supplementary Nutrition Programme (SNP), a component of the Integrated Child Development Services (ICDS) scheme of the Government of India, is an agri-food value chain-based public food distribution initiative to ensure that vulnerable groups get the required nutrition. The objective of the programme is to provide essential services to ensure the health and nutrition outcomes of children 0-6 years of age, adolescent girls, pregnant women and lactating mothers [9].

Therefore, in view of ICDS services to Pregnant and Lactating women, the present study was conducted in rural areas of Medak district to assess the nutritional status of ICDS beneficiaries. Specific objectives included were, evaluation of the ICDS services, to determine the prevalence of anaemia in pregnant women, to analyse the knowledge of pregnant and lactating women regarding nutrition, to determine the prevalence of low birth weight in infants residing in rural areas.

### Methodology

A cross sectional community-based survey was conducted using multi stage random sampling technique. The study was comprised of two groups, Pregnant women (n=150) and lactating women (n=150). The criteria for sample collection was Pregnant and Lactating women (0-6months) who resided in rural areas, and who enrolled their name in ICDS Anganwadi centre (AWC). Medak district was selected for collecting the respective sample groups. Samples were collected from 16 Anganwadi centres, 1 Primary Health Care centre, 1 District Area Hospital. The tools for data collection were Interview schedule, Examination of records and Anthropometric measurements. Pregnant and Lactating women were interviewed by using Questionnaire to elicit information such as demographic data, nutritional information, information regarding pregnancy and lactation, Utilization of ICDS services, and 24-hour dietary recall was collected. Anthropometric measurements of Height, weight and BMI were recorded. Each member of the sample group

was interviewed individually for eliciting the information. The data obtained from questionnaire was compiled in the MS Excel software and mean was calculated by using the formula. The data gathered was coded and tabulated accordingly. Categories were made and percentages were drawn. Appropriate statistical technique i.e. Average, Standard Deviation, Pearson's Coefficient of Correlation was applied and conclusions were drawn out. Nutrient adequacy ratio was calculated for 24-hour dietary recall.

### Results & discussion

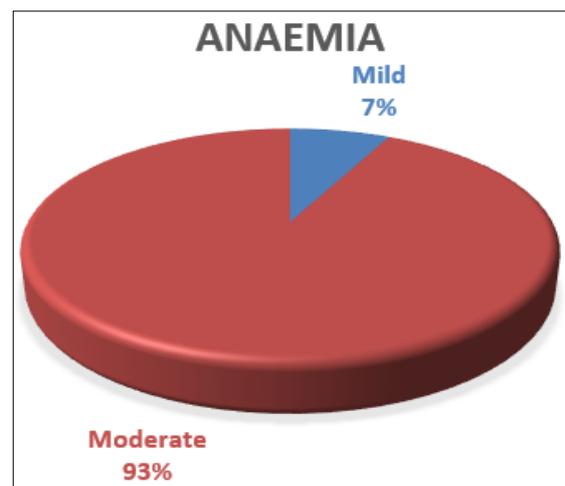
The study was conducted to assess the nutritional status of ICDS beneficiaries and brought the following findings.

**Table 1:** Distribution of ICDS beneficiaries according to BMI category

Category	Pregnant Women (n=150)	Lactating Women (n=150)
Underweight	91 (60.66)	41 (27.3)
Normal	51 (34)	85 (56.6)
Overweight	6 (4)	13 (8.66)
Obese	2 (1.33)	10 (6.66)

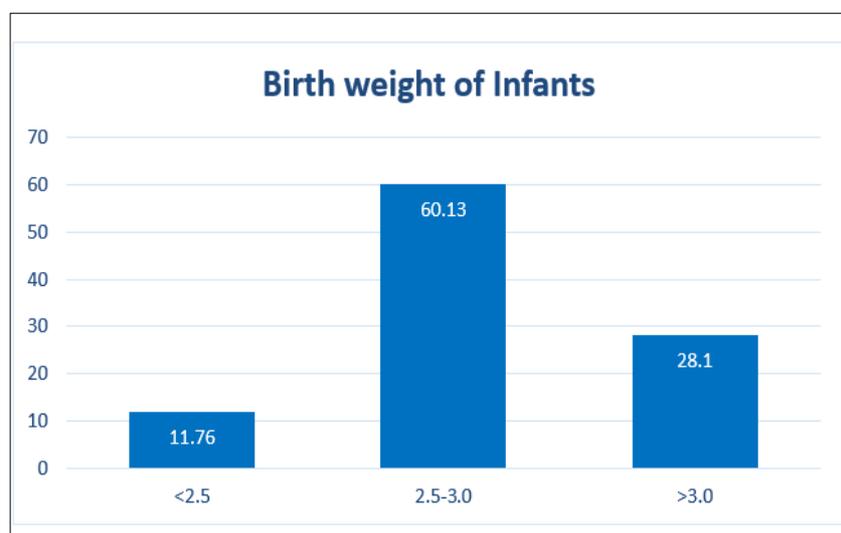
Figures in the parenthesis {} are percentages

Table 1, summarizes the data of BMI. Results showed that 60.66% are underweight when they begin pregnancy, followed by 34% are normal. Only a small percentage i.e., 4% and 2% are overweight and obese respectively. It is noticed that 56.6%, 27.3%, 8.6%, 6.6% of lactating women were normal, underweight, overweight and obese respectively.



**Fig 1:** Distribution of ICDS beneficiaries (Pregnant women) according to Anaemia

It is observed from Figure 1, that 93% of pregnant women are moderately anaemic, whereas 7% are mildly anaemic. A correlation between Iron intake and Haemoglobin was evaluated using Pearson's coefficient of correlation test. It was found that Iron intake had a positive relation with respect to Haemoglobin. Where  $r=0.201$ , it is said to be positively correlated.



**Fig 2:** Distribution of Infants according to Birth weight

It is observed from Figure 2, that 60.13% of children had a birth weight in the range of 2.5-3.0, 28.1% had a birth weight above 3 kgs whereas, only 11% of children had a low birth weight i.e., below 2.5kg.

### Dietary Intake

The nutrient intakes of each individual were compared with

respective RDA for pregnant and lactating women category and percentage of adequacy was computed.

Nutrient Adequacy Ratio = Nutrient intake/ RDA\*100

>100% = Adequate,

>75% = marginally adequate,

50-75%=Marginally inadequate,

<50% = substantially inadequate

**Table 2:** Distribution of ICDS beneficiaries (Pregnant women) according to Nutrient adequacy ratio

Nutrients	RDA	Mean±SD	Nutrient Adequacy Ratio			
			>100	>75	50-75	<50
Energy (kcal)	2250	1268.4±212.6	0 (0)	2 (1.33)	111 (74)	37 (24.7)
Protein (g)	78	46.20±11.090	0 (0)	8 (5.3)	102 (68)	40 (26.67)
Fat (g)	40	31.26±9.62	82 (55)	43 (28.7)	15 (10)	10 (6.67)
Fibre (g)	35	17.45±4.90	0(0)	6 (4)	66 (44)	78 (52)
Vit-B9 (µg)	500	230.21±98.9	3 (2)	2 (1.33)	50 (33.33)	95 (63.33)
Vit – C (mg)	60	62.86±34.12	79 (52.6)	25 (1.65)	25 (16.7)	21 (14)
Vit – A (µg)	800	269±149.07	1 (0.66)	-	41 (27.33)	109 (72.6)
Iron (mg)	35	8.97±7.72	5 (3.33)	5 (3.33)	1 (0.667)	139 (92.67)
Calcium (mg)	1200	514±208.9	1 (0.66)	1 (0.66)	57 (38)	91 (60.7)

Figures in the parenthesis { ( ) } are percentages

It was observed from Table 3, that High proportion of pregnant women had marginally inadequate diet with respect to Energy (76%) and Protein consumption (68%). Majority of women were substantially inadequate diet with

respect to Fiber (52%), Folate (63%), Vitamin A (72%), Iron (92.6%) and Calcium (60.7%). High proportion of Adequacy ratio was observed for Fat and Vitamin C nutrients i.e., 55% and 52.6% respectively.

**Table 3:** Distribution of ICDS beneficiaries (Lactating women) according to Nutrient adequacy ratio

Nutrients	RDA	Mean±SD	Nutrient Adequacy Ratio			
			>100	<75	50-75	<50
Energy (kcal)	2500	1374±192.3	0 (0)	4(2.667)	104 (69.3)	42 (28)
Protein (g)	74	50.32±9.72	0 (0)	50(33)	84 (56)	16 (10.67)
Fat (g)	40	32.85±7.91	21 (14)	81 (54)	39(26)	9(6)
Fibre (g)	35	21±6.06	2(1.33)	35(23.3)	72(48)	41 (27)
Vit-B9 (µg)	300	274.07±84.02	47 (31.3)	60 (40)	34 (22.67)	9 (6)
Vit – C (mg)	80	83.72±55.71	50 (33.3)	37 (2.45)	36 (24)	27 (18)
Vit – A (µg)	950	316.2±121.7	0 (0)	0 (0)	16 (10.67)	134 (89.33)
Iron (mg)	21	10.89±5.19	13 (8.67)	0 (0)	43 (28.67)	94 (62.7)
Calcium (mg)	1200	611.6±190.6	1 (0.66)	6 (4)	75 (50)	68 (45.13)

Figures in the parenthesis { ( ) } are percentages

From Table 4, it was found that Majority of Lactating women were substantially inadequate to Vitamin A (89.33) and Iron (62.7). High proportion of lactating women had marginally inadequate diet with respect to Energy (69.3%),

Protein (56%), Fiber (48%) and Calcium (50%). Marginally adequate diet was observed for Fat (54%) and Vitamin B9(40%) consumption. The mean computed adequacy level of Vitamin C was seen much higher than RDA i.e., (33.3%).

**Table 4:** Distribution of ICDS beneficiaries according to Nutrition Knowledge

Nutrition Knowledge	Pregnant Woman			Lactating Women		
	Yes	No	Don't know	Yes	No	Don't Know
A balanced diet is important during pregnancy	150(100)	---	---	150(100)	---	---
Woman nutrition during pregnancy is different from others	150(100)	---	---	150(100)	---	---
During pregnancy, a woman needs more folic acid and Iron, than a woman who is not pregnant	150(100)	---	---	150(100)	---	---
Nutritional deficiencies during pregnancies could affect health status of mothers and baby	150(100)	---	---	150(100)	---	---
Is, colostrum the first milk healthy for the new born	149(99)	1(1)	---	150 (100)	---	---
Do you know about the rich sources of Protein?	94 (63)	56(37)	NA	119(79)	31(21)	NA
Do you know about the rich sources of Iron?	137(91.3)	13(8.7)	NA	137(91.3)	13(8.67)	NA
Do you know about the rich sources of Calcium?	21(14)	129(86)	NA	22(14.7)	128(85)	NA

Table 4, Represents the Nutrition Knowledge of ICDS beneficiaries. Assessment of knowledge revealed that 100% of beneficiaries had knowledge regarding importance of a balanced diet, right nutrition during pregnancy, Importance of folic acid and Iron during pregnancy and nutritional deficiencies. 99% and 100% of pregnant and lactating women answered that the colostrum is healthy for the new born. Knowledge regarding rich sources of Proteins in

pregnant and lactating women was found to be 63% and 79% respectively, whereas 37% and 21% are unaware of rich sources of Proteins. 91.3% of both the groups had knowledge regarding rich sources of Iron, whereas 8.7% are unaware of it. 86% and 85% of pregnant and lactating women are unaware of Calcium rich sources, whereas only 14% and 14.7% of pregnant and lactating women had knowledge of rich sources of Calcium respectively.

**Table 5:** Distribution of ICDS beneficiaries according to utilization of ICDS services

Particulars	Icds Services	Pregnant Women (N=150)	Lactating Women (N=150)
Enrolment in Anganwadi	a) Yes	150 (100)	150 (100)
	b) No	----	----
Accessible to Anganwadi	a) Yes	147 (98)	150 (100)
	b) No	3 (2)	----
Enrolment in trimester	a) I Trimester	128 (85)	----
	b) II Trimester	19 (13)	----
	c) III Trimester	1 (0.7)	----
Supplementary Nutrition Programme	a) Yes	134 (89)	141 (94)
	b) No	16 (11)	9 (6)
Nutrition & Health Education	a) Yes	138(92)	147(98)
	b) No	12(8)	3(2)
Immunization	a) Yes	150(100)	150(100)
	b) No	----	----
Micronutrient supplementation	a) Yes	143(95)	----
	b) No	7(5)	----
Frequency of visit to Anganwadi	a) Daily	142(95)	144(96)
	b) Alternate days	2 (1)	----
	c) 3-4 times a week	----	2(1.33)
	d) Monthly once	6(4)	4(2.67)

Table 5, Represents the data of utilization of ICDS services in pregnant and lactating women. 85%, 13% and 2.0% of women enrolled their names in 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> trimesters respectively. Therefore, it can be observed that women who registered themselves in the 1<sup>st</sup> trimester have utilized the anganwadi services more effectively when compared to other women who have registered themselves later.

A study conducted by Agarwal KN *et al.*, (2000) proved that the ICDS supplementation has benefited both mother and child when compared with unsupplemented ICDS mothers. 92% and 98% of pregnant and lactating women have utilized Nutrition and health education programs conducted monthly by ICDS Anganwadi centers. The huge participation shows that rural women are being benefited out of ICDS Nutritional Intervention programmes.

### Conclusion

Therefore, from the data it was observed that majority (60.66%) of Pregnant women are underweight when they began pregnancy, whereas only 27.3% of lactating women

are underweight. Thus, to improve the nutritional status of these women ICDS supplementary nutrition programme has come into existence. A study by Coffey D (2015) revealed that 42.2% of women were underweight when they begin pregnancy. A similar study in Lactating mothers revealed that majority of women i.e., 69% had a normal BMI [10].

It was revealed that 93% of pregnant women are moderately anaemic, whereas 7% are mildly anaemic. Similar findings revealed that 54%, 24%, 16%, of rural pregnant women were moderately, mildly and severely anaemic respectively [11]. It was also revealed that lower prevalence of severe anaemia is observed when women were aware about anaemia and consumed Iron and folic acid tablet [1].

It was found that only 11% of children had a low birth weight i.e., below 2.5kg. Although a study revealed that ICDS supplemented women had a significantly smaller proportion of low birth weight babies (14.4%) compared to ICDS unsupplemented (20.4%) and non-ICDS women (26.3%) [12].

The mean intake of Energy, Protein, Fat, Fiber, Folate, Vitamin C, Vitamin A, Iron and Calcium of pregnant women is  $1268.4 \pm 212.6$ ,  $46.20 \pm 11.09$ ,  $31.26 \pm 9.62$ ,  $17.45 \pm 4.90$ ,  $230.2 \pm 98.9$ ,  $62.86 \pm 34.12$ ,  $269 \pm 149.07$ ,  $8.97 \pm 7.72$ ,  $514 \pm 208$  respectively. Thus, nutritional deficiencies during pregnancy will adversely affect the growth and development of the foetus and leads to low birth weight babies. The mean intake of Energy, Protein, Fat, Fiber, Folate, Vitamin C, Vitamin A, Iron and Calcium of lactating women is found to be  $1374 \pm 192$ ,  $50.3 \pm 9.7$ ,  $32.8 \pm 7.9$ ,  $21 \pm 6$ ,  $274 \pm 84.02$ ,  $83.7 \pm 55.7$ ,  $316.2 \pm 121$ ,  $10.8 \pm 5.19$ ,  $611.6 \pm 190$  respectively. Breast milk production is directly dependent on the nutritional status of the mothers, hence nutritionally inadequate diets can alter the amount of breastmilk produced and over a period of time breastmilk output decreases.

It can be observed that majority of women had knowledge regarding importance of colostrum, balanced diet, nutritional deficiencies, rich sources of iron and protein. Thus, it can be concluded that the role of ICDS in imparting nutrition knowledge is found to be beneficial in pregnant and lactating women.

Therefore, it can be observed that majority of women have utilized the ICDS services effectively and the women are aware of the ICDS services that are provided through Anganwadi centers during pregnancy and Lactation period. From the study it was found that the nutrient intake of ICDS beneficiaries was marginally low when compared to 2010 Guidelines on Recommended Dietary allowances for Indians (RDA). The Supplementary nutrition provided by ICDS Anganwadi centres (AWC) to pregnant and lactating women is directed in fulfilling the deficiencies of Calories, Proteins, Vitamins and minerals. Despite the supplementation of Iron, Folic acid and supplementary nutrition, the Haemoglobin levels of majority of Pregnant women (93%) were found to be moderately anaemic. The Nutrition Health Education component of ICDS is meant for effective transmission of basic health and nutrition information to enhance the level of awareness of mothers about their role in child's development. Thus, from the study it is evident that rural women are aware of ICDS services and their utilization is found to be significant in both pregnant and lactating women.

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