Food habits and Nutritional status of pregnant women living in rural and urban areas of Allahabad, India

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Abstract: *Although Indian government is imposing many of the schemes for development of health and nutritional status of the population but several factors like poverty, illiteracy, gender discrimination etc in the population leads to the problem in implementing these interventions (Buckshee 1997). Out of the whole population women are more likely to have poor health as early marriage and child birth are the major detrimental factors for women's health and also responsible for the prevailing wide variation in the socio-economic status.*

In spite of the several critical challenges a woman undergoes pregnancy as it is always a matter of happiness for a woman and her family. This period involves several dynamic changes hence an expectant mother is required to pay critical attention towards her nutritional intake to ensure perfect birth outcomes [1,2]. As a growing fetus solely depends on its mother for development, hence proper maternal nutrition is necessary for adequate maternal health. Improper maternal nutritional intake leads to a myriad of adverse maternal and fetal outcomes like low birth weight, maternal and prenatal mortality, intrauterine growth restrictions, pregnancy induced hypertension and gestational diabetes and fetal programming [3,4].

Key Words: schemes, development, nutritional status, population, illiteracy, discrimination, implementing.

United Nations Population Fund (UNFPA), United Nations Children's Education Fund (UNICEF), World Health Organisation (WHO) and the World Bank, has given a joint report that more than 800 women die daily due to complications in their pregnancy and childbirth and about 99% mortalities occurrs in developing nations. Improper utilization of health facilities and inadequate nutrition leads to common problem of anemia among the reproductive age women which is the main cause of high meternal mortality of about 540 meternal deaths per one lakh live births (NFHS 2) . Haemoglobin could be defined as low blood concentration, which is a major public health concern issue for many developing countries [5]. Although it could affect humans at various stages of the life cycle, anemia is mostly found among pregnant women and children below the age of 5 years. Anemia is a major cause of negative health consequences and intern affects social and economic development of the society[6].

Iron deficiency is the main cause of low heamoglobin and anemia among the pregnant women and account for approximately 50% of all global cases and anemia incidence in pregnancy. Iron deficiency usually occurs due to low dietary iron intake and also due to poor iron bioavailability as plant-based diets are high in inhibitors of iron absorption eg. phytate [7]. the increased physiological changes during pregnancy impose a requirement for additional iron. Women become more prone to infections such as malaria, hook-worm and helminths due to anemia in pregnancy[8].

There is a scarcity of information regarding the diet and nutritional status of pregnant as well as non pregnant non- lactating (NPNL) and lactating women (less than 12 month of lactation).hence the study has been taken to evaluate the diet and nutritional profile of women in rural and urban are of Indian states.

Materials and Methods- Overview and design- A cross-sectional design was applied in the study. A pilot study showed that the study was feasible, appropriate and acceptable. Fifty women from urban and rural area of Allahabad, were included in the pilot study. The clarity of questions included in the questionnaires and the length of time it would take to complete the questionnaires were determined.

Sampling- The study was a quantitative cross-sectional survey comprising 50 pregnant women attending

ante natal clinics in health centres of rural and urban areas in Allahabad region. The simple random sampling technique was used to recruit respondents. Pregnant women recruited into the study were aged 20 to 35 years and were attending antenatal clinic for the first time at the selected health centres over the study period. All women who had a pregnancy without medical complications were identified with the help of study nurses during registration and invited to participate in the study. Pregnant women were exempted from the study if they had complicated pregnancy.

Data collection- A pretested structured questionnaire with closed and open-ended questions was used to obtain information on socio-demographic characteristic; obstetric data; medical history and nutritional status (biochemical assessment). The primary outcomes of concern were anaemia and body mass index (BMI).The questionnaire for this study was pretested and validated to make sure the questions elicited the expected responses. The covariate variables included maternal age, gestational age at recruitment, maternal height, residence and highest educational level attained.

Biochemical assessment- At recruitment, 2mL of venous blood were collected from each participant into EDTA anticoagulant tubes and used for haemoglobin assay. The blood samples were transported from study sites to the laboratory in ice chests containing ice packs. The WHO cut off for determining anaemia in pregnant women, haemoglobin levels less than 11 g/dL, was used for determining anaemia in this study and anaemia was further classified as mild (9.0-10.9 g/dL), moderate (7.0-8.9 g/dL), or severe (<7.0 g/dL).Additionally, the WHO classifies anaemia as severe when the prevalence was 40% or more in any group (all types of anaemia) or when severe anaemia (haemoglobin < 7 g/dL) exceeds 2%.

Statistical analysis- Descriptive statistics, namely frequencies and percentages for categorical data and medians and percentiles for continuous data, were calculated for rural and urban groups. Rural and urban groups were compared by means of 95% confidence intervals for percentage or median differences. Result and Discussion

Table 1- Socio-demographic characteristics of the pregnant women:

Variables	Number of rural women (n = 25)	Percentage (%)	Number of urban women (n = 25)	Percentage (%)
Age in years				
20-25	18	72	11	44
26-30	6	24	11	44
31-35	1	4	3	12
Socio economic status				
lower income group	23	92	22	88
upper income group	2	8	2	12
Educational status				
Illiterate	5	20	1	4
primary	9	36	3	12
Higher Secondary	4	16	2	8
Senior Secondary	2	8	4	16
Graduate	4	16	5	20
Post Graduate	1	4	10	40
Gestational Age				
First Trimester	0		1	
Second Trimester	14		7	
Third Trimester	11		17	

The socio-demographic details of rural and urban pregnant women of Allahababd district are given in the Table 1. Twenty five respondents were selected from each rural and urban location of Allahabad with the mean age of 24.24±3.24 yrs ranging from 20-35 yrs. Most of them as 92% in rural area and 88% in urban area were found to belong to the lower income group. In case of educational status of most of the women in rural areas (20 %) were found illiterate,36 % were having educational status only up to primary and only 4% were found post graduate, on the contrary 40% women in urban region were found to have post graduate qualification and only 4% were found to be illiterate. Hence there is a significant difference was found in educational status of rural and urban women. Most of the women selected for the study were having their second or third trimester of pregnancy.

ARYAVART SHODH VIKAS PATRIKA
RNI TITLED NO.   UPBIL04292
RNI REG. NO. UPBIL/2014/66218

ISSN   NO.- 2 3 4 7 - 2 9 4 4 (Print)
e-ISSN   NO.- 2 5 8 2 - 2 4 5 4 (Online)
Vol.-15, No.- IV, Issues-26, YEAR- Oct.-Dec.-2022

Table 2- Prevalence of anaemia and nutritional status of pregnant women in rural and urban region of Allahabad

Variables	Number of rural women (n=25)	Percentage (%)	Number of urban women (n=25)	Percentage (%)
Anemia				
< 7 g/dl (Severe)	0	0	0	0
7-9.9 g/dl(Mild)	2	8	2	8
10-11.9 g/dl(Moderate)	23	92	23	92
BMI				
Underweight(13 to 18)	3	12	0	0
Normal(18 to 23)	16	64	15	60
Overweight(23 to 28)	5	20	9	36
Obese(28 and above)	1	4	1	4

Table 2 provides the nutritional status of pregnant women. Almost all the women (92%) were found to be non anemic in both the rural and urban groups. In case of BMI 64% of rural women were having normal BMI 20% were found to be overweight 12% as underweight and only 4% were found obese. Similarly in case of urban area 60% were found to have normal BMI, 36% were overweight and no underweight patient were found.

Table 3- Prevalence of other complications associated with pregnant women in rural and urban region of Allahabad

Variables	Number of rural women (n=25)	Percentage (%)	Number of urban women (n=25)	Percentage (%)
Systolic blood Pressure				
High(>120mm/Hg)	0	0	0	0
Normal(90-120 mm/Hg)	25	100	25	100
Low(,90 mm/Hg)	0	0	0	0
Diastolic blood Pressure				
High(>80mm/Hg)	0	0	0	0
Normal(60-80 mm/ Hg)	25	100	25	100
Low(<60mm/Hg)	0	0	0	0
Random Blood Sugar				
High	0	0	0	0
Normal	25	100	25	100
Low	0	0	0	0

Table 3 shows the complications associated with pregnancy and it was found that all the factors , systolic and diastolic blood pressure , random blood sugar were found in the normal range in pregnant women of both the rural and urban region. The results have shown that the respondents chosen were not having any complications associated with their pregnancy.

Table 3- Bivariate analyses of factors associated with anaemia of pregnant women

Characteristic	Anaemia				Test Statistics
	No (46)		Yes(4)		
	n	(%)	n	(%)	
Parity					
0	15	32.61	1	25	
1	11	23.91	0	0	X^2= 43.66
2	13	28.26	1	25	p value= 0.001
>2	7	15.22	2	50	
Food habit					
Vegetarian	22	47.82	1	25	X^2= 11.24
Non – Vegetarian	24	52.18	3	75	p value= 0.0007
Maternal Age					X^2= 172.12
20-25	27	58.69	2	50	p value= 0.004
26-30	15	32.60	2	50	
31-35	4	8.695	0	0	
Gestational Age					
First trimester	0	0	1	25	X^2= 35.42
Second trimester	19	41.30	2	50	p value= 0.001
Third trimester	27	58.70	1	25	

According to Table- 3 determinants of anemia was analyzed and it was found that all the factors like parity, food habits, maternal age as well as gestational age have a high impact on anemic profile of a pregnant women as most of the (50%)women having more than two children were found to have anemia. Similarly in case of maternal age most of the anemic women were having the age less than 30 years. In case of gestational age most of the anemic women were found to lie in second trimester of their pregnancy however most of the non anemic women were found to reach their third trimester of pregnancy.

Discussion- The objective of the study was to determine the factors that are associated with the nutritional status of pregnant women in rural and urban areas in the district of Allahabad. The findings of the study suggest that number of children, maternal age, and gestational age are significant determiners of anaemia among pregnant women in the study. More parity leads to the decrease in nutritional health as more of the anemic women were found to have more than two children.

A direct association was observed among gestational age and anemia in the present study. Most of the subjects having anemia were found to be in their second trimester of gestation. It is a well-established fact that as the plasma volume increases, the level of haemoglobin and haematocrit decreases during the first trimester and come to the lowest levels at the end of the second trimester and again increases in the third trimester of pregnancy. The fall in haemoglobin concentration can negatively affect the health of the mother if appropriate measures are not taken. Findings of the present study is supported by the study of Kumar [9].

An association between maternal age and anaemia was also observed in this study. Particularly subjects within the age bracket of 30 to 35 years were not found to have the problem of anemia counter to those within the bracket 20 to 30 years. This could be due to the fact that the later age bracket includes teenagers. Apart from the many physiological changes that increase nutrient needs, pregnancy during teen years increase the risk of undesirable effects such as anaemia.

Conclusion- In the present study it was observed that there is equal number of anemic respondents found in rural as well as urban population. Parity, food habits, maternal age as well as gestational age were the factors found responsible for anemic profile of these anemic women. Non vegetarian diet was proved to be more responsible for anemia in comparison to vegetarian diet. Higher number of issues, lower maternal age and second trimester of gestation were also proved to be important factor for occurrence of anemia in pregnancy. Most of the women were found to have their BMI in normal range hence they were found to have no complications like high blood pressure or high blood sugar during their pregnancy.

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