

Health and Nutrition Issues of Rural Women in India

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Abstract—Diet and nutrition are important factors in the promotion and maintenance of good health throughout the life cycle. Income, prices, individual preferences and beliefs, cultural traditions, as well as geographical, environmental, social and economic factors all interact in a complex manner to shape dietary consumption patterns and affect the morbidity and clinical status of women. A normal balanced diet must include daily foods from the various food groups in sufficient amounts to meet the needs of an individual and to increase immunity. The study was undertaken to assess the nutritional status, dietary intake and Deficiency patterns among 50 non-pregnant non-lactating rural women of reproductive age group (18-40 years) in the village Rajpur (Aligarh), U.P. and Khajurka (Palwal), Haryana. A cross-sectional survey was conducted using both qualitative and quantitative data-collection methods. The study involved interviews using a questionnaire, measurement of

food/nutrient intake, anthropometry, and observations of clinical signs of deficiencies. The average daily energy consumption per capita per day was 1853kcal, which is 16.71 per cent less than Recommended Dietary Allowance (2225 kcal). Protein, Iron, and Ascorbic acid intake in the daily diet of women was found to be 7, 14.33, and 16.71 per cent less than recommended level. Prevalence of Chronic Energy Deficiency (CED) was also found in village cluster.

1. INTRODUCTION

Women have always emerged as the pillars of the rural economy due to their involvement with agriculture and household chores.

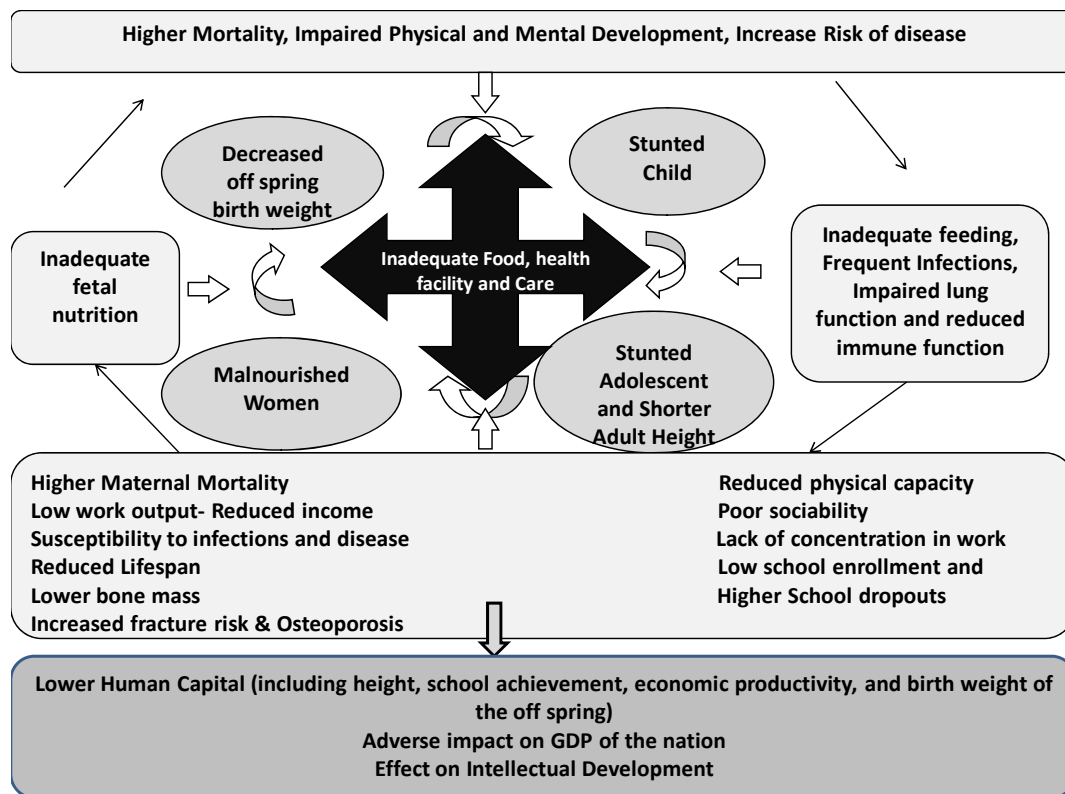


Fig. 1: Model on Poor Nutrition and causes of malnutrition throughout the Life Cycle

Global entry of women into economic employment, particularly focusing on agriculture, and the occupational hazards and related adverse health outcomes that they encounter in farm women is also increased in terms of malnutrition. A third of women of reproductive age in India are undernourished, with a body mass index (BMI) of less than 18.5 kg/m². Anaemia in young children, adolescent girls and women across the life cycle, is also reflected in that three out of four young children are anaemic (79%) and anaemia prevalence in young children, under 3 years has increased from 74 % to 79% between NFHS 2-1998-99 & NFHS 3-2005-06 data reports.

It is well known that an undernourished mother inevitably gives birth to an undernourished baby, perpetuating an intergenerational cycle of under nutrition (UNICEF). The model presented in Fig. 1 depicted that a malnourished women will give birth to low birth weight and malnourished baby who is prone to infectious diseases may have impaired physical and mental development. Further that malnourished child is grown as stunted child and if inadequate feeding and if proneness to infections persists, she will grown as stunted adolescent whom physical development, sociability and work capability will hinder the development and finally became a malnourished women having higher maternal mortality, low work output and reduced lifespan. This creates a major problem with malnutrition, especially for pregnant or nursing women and became a vicious cycle of malnutrition with having root cause of inadequate food, health, care and nutrition issues. Poor fetal growth or stunting in the first 2 years of life leads to irreversible damage, including shorter adult height, lower attained schooling, reduced adult income, and decreased offspring birth-weight. Children who are undernourished in the first 2 years of life and who put on weight rapidly later in childhood and in adolescence are at high risk of chronic diseases related to nutrition. There is no evidence that rapid weight or length gain in the first 2 years of life increases the risk of chronic disease, even in children with poor fetal growth. The prevention of maternal and child under nutrition is a long-term investment that will benefit the present generation and their children. Promotion of good nutrition in early life is particularly important for health later in life because either under nutrition or over nutrition can cause lifelong, irreversible damage.

As women are instrumental in the acquisition of food, its preparation, storage and distribution, they are very often subjected to malnutrition and form a group highly vulnerable to morbidity and mortality due to undernutrition. The major cause seems to be undernutrition; the condition refers to inadequate intake of protein and calories for a long time that also leads to the deficiency of micronutrients such as minerals and vitamins. When sufficient calories are not consumed, the body first utilizes its stored fat then muscles and tissues. The malnutrition is directly associated to other factors also such as lack of health awareness amongst women, illiteracy, low

socio-economic status, poor housing conditions, early marriage, low income, poor sanitation, and stressful environment, use of narcotics, child bearing, overwork and to some extent lethargy. Body becomes more prone to diseases when adequate amount of nutrient is not provided through diet. A women's health will be less productive in the labour force. Malnutrition, prevalent in every age group having an adverse effect through a greater susceptibility to infections, through increased morbidity and mortality, through decreased productivity and through a lesser quality of life. While malnutrition is prevalent among all segments of the population, among women begins infancy and continues throughout their life time (Chatterjee, 1990; Desai, 1994). India's maternal mortality rates in rural areas are among the world's highest. From a global perspective, India accounts for 19% of all live births and 27% of all maternal deaths (NFHS-3 data). The health of Indian women is intrinsically linked to their status in society, especially for those living in a rural area. Research into women's status in society has found that the contributions Indian women make to families are often overlooked. Instead they are often regarded as economic burdens and this view is common in rural areas of the northern belt. The nutrition transition in low income countries is being recognized as an emerging crisis due to changing health profiles (Popkin, 1994).

A classical example of changing health profile is evident from the nationwide surveys mapping the nutritional profile of women (NFHS, 2007). According to NFHS III data, more than a third (36%) of women has a BMI below 18.5, indicating a high prevalence of nutritional deficiency. The health status of Indians, is still a cause for grave concern, especially that of the rural women. This is reflected in the life expectancy (62.5 years), infant mortality rate (57/1000 live births), maternal mortality rate (230/100 000 live births) (NFHS-3 data) Women require high-quality nutrients as their work load and energy expenditure is more; however in some areas of India women typically eat last and least. More than half of all Indian women develop anemia due to lack of essential nutrients (TOI, 2011; NFHS 3, 2007). In fact, nearly 22,000 people, mainly pregnant women, die every year from severe anemia (Anonymous, 2011). It has been estimated that prevalence of clinical and sub clinical vitamin A deficiency in India is among the highest in the world (World Bank 2005).

Some evidence exists that while women get a disproportionately small share of household food, they may expend a larger proportion of household energy. Various studies suggest that women work longer hours and expend more energy than men. One estimated that women had a shortfall of 100 calories a day on average if their physical activity in paid and unpaid domestic work was considered all together, while men had a surplus of 800 calories (Batiwala S, 1982). Adequate nutrition, a fundamental cornerstone of any individual's health, is especially critical for women because inadequate nutrition wreaks havoc not only on

women's own health but also on the health of their children. Children of malnourished women are more likely to face cognitive impairments; short stature, lower resistance to infections, and a higher risk of disease and death throughout their lives (see Figure 1).

Women are more likely to suffer from nutritional deficiencies than men are, for reasons including women's reproductive biology, low social status, poverty, and lack of education. Socio-cultural traditions and disparities in household work patterns can also increase women's chances of being malnourished

2. METHODOLOGY

In the present investigation dietary assessment was done using frequency of food consumption and dietary intake survey by 24hour recall. Frequency of consumption of raw foods per month was collected with the help of a questionnaire and computed as daily intake of foods by average number of respondents. Weighment survey was also conducted for a sub-sample of 10% of sample for purpose of validation of data (Thimmayamma et al. 2009). Dietary intake data for all subjects was collected twice for every subject on a week day to avoid bias and average food and nutrient intake computed using food composition tables for Indian foods (Gopalan C. et al., 1996). The percent adequacy of nutrient intake was determined using the latest recommended dietary allowance given by Indian Council of Medical Research (ICMR 2010).

3. RESULTS AND DISCUSSION

The results of the study are summarized in Tables 1- 5. Table 1 presents the data on physiological status of subject analyzed using different parameters. In the investigation the subjects were mean age of 32.31 ± 7.42 years, having mean height of 154.17 ± 8.52 centimeters, mean weight 42.05 ± 3.12 Kg, mean blood pressure 82.51 ± 2.17 and corresponding to mean BMI, kg/m^2 of 17.69 ± 6.25 .

Table 1: Physiological Characteristics of the Subject N=50

Physiological Characteristics	Mean \pm SD
Age, Years	32.31 \pm 7.42
Weight, Kg	42.05 \pm 3.12
Height, cm	154.17 \pm 8.52
Blood Pressure (Sys/Dia)	116.52/68.78
Mean Blood Pressure	82.51 \pm 2.17
Pulse Rate (per min)	68.95 \pm 2.14
BMI, kg/m^2	17.69 \pm 6.25

The food frequency data of subjects computed as intake per day by number of respondents is summarized in Table 2. Food frequency revealed that the major cereal consumed was wheat followed by pearl millet. Rice was consumed to a lesser extent and other cereals were rarely used. Among legumes, use of green gram dhal and cow pea was very common; other grams were used only once or twice a week indicating a low level of

dietary diversity. Among vegetables only few seasonal vegetables were used, the use of green leafy vegetables was only once or twice a week. Fruits were rarely used. Milk and curd was a common commodity in all households. Overall food frequency indicated that the varieties of foods used were very limited and subjects depended mostly on locally grown produce.

Table 2: Frequency of daily food consumption (number of subjects) N=50

Food stuffs	Frequency of daily use	Food stuffs	Frequency of daily use
Cereals		Animal foods	
Wheat	50	Egg	2.3
Pearl Millet	36	Mutton/Chicken	1.3
Rice	17	Milk and milk products	
Legumes		Milk	50
Green gram dhal	18	Curd	38
Red gram dhal	13.5	Butter Milk	36
Cowpea	18.58	Ghee	28
Field bean	9	Green Leafy Vegetables	
Fruits		Spinach	17.5
Banana	12	Amaranths	12
Tomato	29.5	Fenugreek	32
Guava	6.8	Coriander	13
Grapes	3.2	Roots and tubers	
Ber	7.8	Onion	12
Miscellaneous		Potato	50
Tea	50	Other vegetables	
Coffee	4.5	Ladies finger	7
		Brinjal	22
Sugar	50	Bottle gourd	12.7
		Bitter gourd	13
Jaggery	28	Cauliflower	27.5

Dietary intake of subjects was determined with 24 hour recall survey. Table 3 presents the mean nutrient intake and average percent adequacy of nutrient intake by all subjects.

Table 3: Nutrient intake and average percent adequacy of nutrient intake by respondents

Nutrients	Nutrient Intake Mean \pm SD	RDA	% Change then RDA (t-test calculated)
Energy (kcal)	1853 \pm 3.12	2225	-16.7191**
Protein (g)	46.5 \pm 1.75	50	-7**
Calcium (g)	823 \pm 4.98	600	37.1667*
Iron (mg)	25.7 \pm 2.25	30	-14.33333*
B-carotene (μg)	3568 \pm 3.47	2400	48.6667*
Thiamin (mg)	2.1 \pm 4.25	1.3	61.5385**
Riboflavin (mg)	2.3 \pm 6.51	1.3	76.9231*
Nicotinic acid (mg)	24.3 \pm 3.10	15	62*
Ascorbic acid (mg)	85.7 \pm 1.79	40	-16.7191*

* Significant @5% level, ** Significant @1% level

The diets were inadequate in energy, protein, iron and ascorbic acid contents with 16.71, 7, 14.33, and 16.71 percent less than recommended dietary allowances given by ICMR, 2010. Body Mass Index (BMI) of the respondents was computed using height and weight values and subjects were classified into various categories of Chronic Energy Deficiency (James et al., 1988). The findings in Table 6 and figure 1 suggest that prevalence of Chronic Energy Deficiency was high among farm women. Approximately 52 percent of women found to be in different grades of CED and only 16 percent women were found to be normal.

Table 6: Prevalence (%) of chronic Energy Deficiency (CED) among farm women.

BMI grades	BMI Range	Frequency	Percentage
CED III	Less than 16	12	24 %
CED II	16-17	5	10 %
CED I	17.18.5	9	18 %
Low-Normal	18.5-20	6	12 %
Normal	20.25	8	16 %
Over weight & obesity	≥ 25	0	-

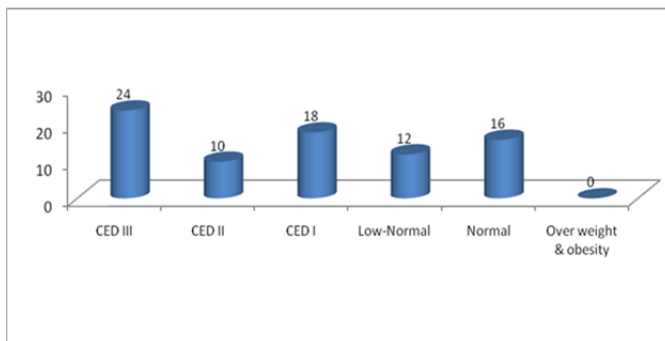


Fig. 1: Prevalence (%) of chronic Energy Deficiency (CED) among farm women

Renu Jethi and Nirmal Chandra in 2013 also reported that this prevalence was found directly related to the calorie intake of the women. The BMI has good correlation for fatness and it indicates the muscle and fat mass in the adult body. In chronic

energy deficiency, body weight and lean body mass is reduced leading to reduced energy cost of physical activity. As CED impairs the work performance, the working potential of subjects is likely to be reduced. The BMI is widely used as a measure of fatness, or the nutritional status of a population in both developed and developing countries.

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