

## Nutritional Status and Knowledge of Hill Women on Anemia: Effect of Various Socio-demographic Factors

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**KEYWORDS** Nutritional Anemia. Knowledge. Nutritional Status. BMI

**ABSTRACT** Anemia is a common health problem among women throughout the world. However, there has been minimal research on women's concepts of anemia. The present study was thus undertaken with the objective to assess the nutritional status of rural hill women and to study the knowledge of hill women regarding nutritional anemia. In addition to this, the effect of various socio-economic and demographic factors on the nutritional anemia related knowledge of hill women. The cross-sectional study was carried out in three villages of Nainital District, Uttarakhand. The study was confined to the women of age group of 18-45 years. A total of 223 women were selected randomly. Their knowledge was tested and socio-demographic and nutritional profile was recorded. From the outcome of study it was observed that mean percent knowledge score of subjects was 23.28. Knowledge scores were found to be increasing with decreasing age and they were significantly associated with educational status. Mean height of subjects was 151.21 cm and mean weight of subjects was 48.76 kg. BMI calculations revealed that 41 % subjects were suffering from various degrees of malnutrition. Conclusion was that knowledge of rural women was found to be very poor in regard of nutritional anemia, nutritional status of as high as 41 % subjects was unsatisfactory. To eradicate the problem of nutritional anemia a more intense awareness campaign is required in the region.

### INTRODUCTION

Iron-deficiency anemia is the most common form of malnutrition in the world and is the eighth leading cause of disease in girls and women in developing countries (World Bank 1993). About one-third of the global population is anemic (WHO 2010). Its estimated prevalence in South-East Asia is 50% to 70% (UNICEF 2002). In India, two-thirds of the women of child bearing age are estimated to suffer from iron deficiency anemia. Reports indicate that 15 per cent of all maternal deaths are attributed to anemia (IIPS 2007; Chakma 2000; National Nutrition Monitoring Bureau 2002; Micronutrient Initiative 2007). The high prevalence of anemia among women in India is a burden for them, for their families, and for the economic development and productivity of the country (Bentley and Griffiths 2003).

Whereas severe anemia is closely related to risk of mortality, even mild anemia carries health risks and reduces the capacity to work (Cohen and Gibor 1980). Severe anemia is known to

result in obstetric risks such as foetal complications and increased infant and maternal mortality, a variety of functional disabilities such as reduced working capacity, defective immune response, impairment of learning ability and physical fitness occur even in mild to moderate anemia.

In spite of programmes, there is no significant decline in the prevalence of anemia in the country. Lack of knowledge of the dietary requirements and the nutritive value of different foods is an important contributory cause of widespread occurrence of malnutrition among vulnerable section of the population in the developing countries. Government of India has started many intervention programmes to eradicate the problem of anemia in the country but most of the efforts are towards the supplementation of iron tablets to the women. Ignorance, which is one of the leading causes of malnutrition, has hardly been addressed in these programmes. The present study was thus planned to assess the nutritional anemia related knowledge of hill women, their nutritional status and to see the association of various socio-economic and demographic factors, on the nutritional knowledge of hill women of Uttarakhand.

### METHODOLOGY

The present study was conducted in three villages of Uttarakhand. The villages (Amia

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Gaon, Jeolikote Amritpur) selected come under Bhimtal block of Nainital District. Economics and statistic officer of District Nainital was contacted to find the number of villages and their population. A total of three villages were selected using purposive sampling base on accessibility. The study was confined to the women of age group 18-45 years only. Randomly 223 subjects willing to participate in the study were chosen. A survey schedule was prepared to collect various information regarding subjects. Schedule was pre- tested on a non- sample population having similar socio-economic background. General information of subjects was collected using the same schedule. Nutritional anthropometry of all subjects was done. Anthropometric measurements of women recorded included weight and height. The method as suggested by Gibson (1990) was followed for this. Measurements were taken in triplicate and average values were recorded. An electronic weighing machine made with a maximum capacity of 130 and least count of 0.1 kg was used to record the body weight and a vertical anthropometric rod with the least count of 1.0 mm was used for measuring height. The extent of malnutrition in women was assessed by computing the BMI (Body Mass Index). The weight and height were compared with Indian and National Center for Health Statistics (NCHS) standard. Effect of age height weight BMI education occupation number of children and per capita income on the nutritional knowledge was tested statistically.

To test the knowledge of women on anemia, a set of 20 questions of multiple choice nature related to anemia were used. Questions were related to causes, prevention, symptoms and control of anemia. The questions were got approved by a panel of eight experts and pre tested on a non sample population. On account of wide variations in the scores obtained by subjects, the knowledge level was divided into three categories viz. low, medium and high. Accordingly the number of respondents, obtaining the scores, falling in different categories was zero to 33 per cent low, 34-66 per cent medium and 67-100 per cent high.

**Data Analysis:** The statistical analysis was done on computer in MS –excel and M Stat with compiler. The data was analyzed for percentage, mean, standard deviation, Chi-square test, and correlation coefficient.

## RESULTS

The present study was conducted on women of reproductive age. The range of age for the present study was 18-45 years. Average age of the subjects was  $31.23 \pm 7.03$ . Seventy-one per cent of women were in the age group of 20-40 years. The villages were dominated by Hindu (97.75 %) community, only 2.25 per cent were Muslims and none of them observed Christianity, Sikhism or any other religion. Nuclear and joint families were almost same in number. The percentage of nuclear families was 48.88 while percentage of joint type families was 47.98. Only a very small segment (3.14%) belonged to extended family. Small family, that is two children per couple, was observed only in 17.48 per cent of the families. Majority (52.39 %) of the families had 3-4 children per couple. Couples having 5-6 children were observed in 25.13 per cent families. The literacy level in villages studied showed a very high percentage of formal schooling i.e. 85.66 per cent and rest 14.34 per cent had ability to read and write with understanding. All the subjects surveyed were engaged in household tasks. About 60 per cent women were engaged in farming along with household work. All the subjects surveyed belonged to marginal farmers category having less than 2.5 acres of land. Villages were connected by municipality supply of tap water and electricity. Average per capita income of the families were Rs 503.35 and the range of monthly income was Rs 1250 to 15,0000 (Table1).

In present study, the mean score obtained by subjects was only 21.32 per cent, indicating low knowledge score (Table 2). As high as 66.32 per cent subjects were having low knowledge scores, only 4.56 per cent were in high knowledge category, rest were having scores of medium knowledge category. Knowledge scores were computed separately for subjects on the basis of age group, occupation, education. Highest scores were obtained by women of 18-25 years. Least mean scores were obtained by women of 36-45 years. Educational qualification was found to be significantly related with knowledge scores. Knowledge scores increased with the increased educational level. So the Graduate women obtained maximum mean per cent score that is  $45 \pm 29.15$  and women having education nil to



**Table 4: Mean height, weight and BMI of subjects**

Parameter	Mean Value
Height	151.21 ± 3.93
Weight	48.76 ± 5.76
BMI	21.41 ± 2.54

than Indian standards was 10.37 and percentage having body weight less than NCHS standard was 49.28. The mean body mass index of the subjects was 21.13 kg/m<sup>2</sup> (Table 4). Based on BMI 58.29 per cent subjects were normal and rest were suffering from various degrees of malnutrition. None of the subjects fall in chronic energy grade III and Obese grade II. Percentage of Low weight normal and obese grade I was 18.83 and 8.97 respectively (Table 5).

**Table 5: Classification of subjects on the basis of BMI**

BMI category	N	%	BMI
Chronic energy deficiency grade III	0	0	-
Chronic energy deficiency grade II	3	1.35	16.73
Chronic energy deficiency grade I	28	12.56	17.85
Low weight normal	42	18.83	19.22
Normal	130	58.29	22.04
Obese grade I	20	8.97	26.47
Obese grade II	0	0	-

Significant negative correlation between age and height was found. BMI and age was also significantly related. Number of children was also significantly associated with age. Weight was significantly and positively correlated with BMI. Knowledge on anemia was significantly associated with type of occupation. Per capita income was significantly and negatively correlated with number of children. Knowledge was

found to be significantly related with per capita income. Correlation between other variables did not show any significant association (Table 6).

## DISCUSSION

Nutritional status assessment and nutritional knowledge regarding anemia assessment was done in randomly selected 223 female subjects of reproductive age group (18-45 Years) in three villages of Uttarakhand.

General profile survey showed 52.39 per cent of the subjects had 3-4 children per couple and couples having 5-8 children were 25.13 per cent. This indicates that family planning is not properly being followed and indicates need for family welfare education in this area. Educational level in the area was found to be considerably high. This is in accordance with the literacy rate in Uttarakhand. However, those who could not attend the school or those who could not study beyond primary school cited the reasons that, i. inadequate number of schools and colleges in rural areas, ii. poor transportation facilities, and iii. ignorance of parents about the benefit of sending children especially girls to the school or colleges. In agricultural sector of Uttarakhand, women play a leading role. The contribution of women in agriculture of Uttarakhand is 80 % (GB Pant university of Agriculture and Technology 2001). This trend was observed in surveyed families also. About 60 per cent women were engaged in farming along with the day to day tasks. Subjects basically belonged to marginal class farmers. Those who had less than 0.5 acres of the land were utilizing their land as kitchen garden and were growing fruits and vegetables. Most of the families had fruit trees in their kitchen garden.

**Table 6: Correlation matrix of variable**

	Age	Height	Weight	BMI	Occupation	Number of children	Per capita income	Knowledge
Age	1							
Height	-0.169721*	1						
Weight	0.012326	0.065029	1					
BMI	0.235197**	-0.02767	0.335709**	1				
Occupation	0.044756	-0.01558	-0.02449	0.037412	1			
Number of children	0.725214**	-0.10443	0.005406	0.183884**	0.066323	1		
Per capita income	-0.137612*	0.023236	0.003366	-0.05731	-0.05664	-0.11367*	1	
Knowledge	-0.040433	0.098054	-0.05506	0.174077**	0.143115*	-0.05702	0.391483**	1

\* Significant at (P<0.01)

\*\* Significant at (P<0.05)

Per capita monthly income of the families as per the classification given by Prasad (1991) was calculated. Results shows that none of the families belonged to either grade I which is more than 157.98 or grade V (236.85-457.91). Majority of the families belonged to III and IV grade. India's official poverty measure has long been based solely upon the ability to purchase a minimum recommended daily diet of 2,400 kilocalories (kcal) in rural areas where about 70 percent of people live, and 2,100 kcal in urban areas. Rural areas usually have higher kcal requirements because of greater physical activity among rural residents. The National Planning Commission, which is responsible for the estimate, currently estimates that a monthly income of about Rs. 356 (about US\$7.74) per person is needed to provide the required diet in rural areas and Rs. 539 in urban areas. Factors such as housing, health care, and transportation are not taken into account in the poverty estimates (Haub and Sharma 2010). When compared with the income data of poverty line, 30.49 % of the subjects were found below poverty line. Average per capita income of the subjects was Rs 503.35 which was slightly higher than the States average value. The per capita income in rural areas is maximum at Rs 478.02 in Uttarakhand. Another interesting fact is that though Uttarakhand has the highest per capita income in rural areas it has as many as 27.11 lakh people living below poverty line in rural areas at 40.8% which is almost double the national average of 28.3% (UNDP 2010) .

Poor knowledge regarding nutrients, their sources and requirements is always been considered as one of the factors affecting adversely the nutritional status of population. In present study also nutritional status of the surveyed subjects were found unsatisfactory. Measurement of height and weight are two important indicators of nutritional status of any population. In adulthood height reflects the past nutritional status whereas the weight reflects the current nutritional status. For Indians, average height of women is 156 cm (ICMR 1989). In the present study mean height of subjects was 151.21 cm, which was less than ICMR value. Reference women weight for establishing the RDA is taken as 50 kg. In present study weight ranged between 37.25-63.8 kg. Mean weight of subjects was 48.76 which was less than the weight of Indian reference women. Reduction of body

weight occurs when energy intake is less than output. This is largely the result of utilization of body energy stores and the use of body tissue as fuel in an energy deficient intake, thus reducing the body weight. Lower body weights decreases the productivity, work capacity in female workers is negatively and significantly correlated with the body weight (Vijaylakshmi et al. 1987)

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. In the present studied population, 60.53 per cent of the subjects belonged to farming class. As CED impairs the work performance, the working potential of such subjects is likely to be reduced. Nutritional knowledge of women was tested and questions included in knowledge test paper were based on the assumption that all adult women should know the answers of all questions asked about anemia. Mean score obtained by subjects were only 21.32 per cent indicating low knowledge score. Only 33.2 percent women knew the reasons of anemia. Highest knowledge score were obtained by women of 18-25 years age group. This may be because many subjects in this age group were students and were exposed to information regarding anemia either through text book or by other means. Least mean score was obtained by women of 36-45 years. This age group was also having maximum number of subjects having education up to primary level only. Since knowledge scores were found increasing with increasing educational qualification, low educational qualification in this age group may have been reason of the low knowledge about anaemia. Pon et al. (2006) in their study on women of Malaysia also found that women had very low knowledge of nutritional foods and found that education was significantly related with their nutritional knowledge.

Educational qualification was found to be significantly related with knowledge score. Subjects with qualification up to primary school scored least (24.48), while those with qualification above graduation scored highest (45 %). This may be because of greater exposure to the information of the subjects with higher educational qualification. Women engaged in service and household task scored more than women engaged in farming. The reason for this

again could be higher qualification of women engaged in service. The most striking factor, which came out to affect the knowledge of subjects on anemia was educational qualification because other factors such as age and occupation were also influenced by this parameter. Bharti et al. (2008) also have reported that educational qualification is a key determinant of nutritional status in Indian women.

### CONCLUSION

Poor knowledge regarding anemia was observed amongst the rural hill women. Ignorance has been considered as one of the root causes of malnutrition in the country. A high proportion of subjects were suffering from various degrees of malnutrition. From the results it can be concluded that nutritional status as well as nutritional knowledge of hill women is unsatisfactory and needs interventions.

### RECOMMENDATIONS

So there is a need to revitalize and strengthen the nutrition education component of Government programmes like ICDS. These ongoing programmes if carried with proper motivation would help in combating the nutritional problems of the country.

### REFERENCES

- Bentley ME, Griffiths PL 2003. The burden of anemia among women in India. *European Journal of Clinical Nutrition*, 57: 52-60
- Bharati P, Som S, Chakrabarty S, Bharati S, Pal M 2008. Prevalence of anemia and its determinants among non-pregnant and pregnant women in India. *Asia-Pacific Journal of Public Health*, 20(4): 347-355
- Chakma T, Rao PV, Tiwary RS 2000. Prevalence of anemia and worm infestation in tribal areas of Madhya Pradesh. *Journal of Indian Medical Association*, 98: 567-561.
- Cohen BJB, Gibor Y 1980. Anemia and menstrual blood loss. *Obstet Gynecol Surv*, 35: 597-618
- GB Pant University of Agriculture and Technology 2001. *Vision 2020 Perspective Plan. Salient Features of Uttaranchal and Priority Areas for Research and Development*. Pantnagar: GB Pant University of Agriculture and Technology.
- Gibson RS 1990. *Principles of Nutritional Assessment*. Oxford: Oxford Publishing Company.
- Haub C, Sharma OP 2010. What is poverty, really? The case of India. Population Reference Bureau. <http://www.prb.org/articles/2010/indiapoverty.aspx>. (Accessed on 5 October, 2010).
- ICMR 1989. *Nutritional Requirements and Recommended Dietary Allowances for Indians*. Hyderabad: National Institute of Nutrition.
- Micronutrient Initiative 2007. *India Micronutrient Investment Plan 2007-2011*. Delhi: Micronutrient Initiative.
- IIPS 2007. *National Family Health Survey 2005-2006*. Mumbai: International Institute of Population Science.
- National Nutrition Monitoring Bureau 2002. Hyderabad: National Institute of Nutrition.
- Pon LW, Noor-Aini MY, Ong FB, Adeeb N, Seri SS, Shamsuddin K, Mohamed AL, Hapizah N, Mokhtar A, Wan HW 2006. Diet, nutritional knowledge and health status of urban middle-aged Malaysian women. *Asia Pacific Journal of Clinical Nutrition*, 15(3): 388-399.
- Prasad BG 1991. Social classification need for constant updating. *Indian Journal of Community Medicine*, 18: 60-61.
- UNDP 2010. Available from [www.undp.org.in](http://www.undp.org.in) (Accessed on 24<sup>th</sup> May 2010).
- UNICEF 2002. *Prevention and Control of Nutritional Anemia: A South Asia Priority*. Kathmandu: United Nation's Children Fund Regional Office for South Asia.
- Vijayalakshmi P, Kupputhathai V, Maheshwari A 1987. Anemia and work output of farm women. *Indian Journal of Nutrition and Dietetics*, 24(8): 253-259.
- WHO 2010. Micronutrient deficiency battling iron deficiency anemia: The challenges. Available at <http://www.who.int>. (Accessed on April 20, 2010).
- World Bank 1993. *World Development Report: Investing in Health*. New York: Oxford University Press.