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Original Research Article

Understanding anemia and food practices of India: evidences from National Family Health Survey

Manoranjan Mohapatra*

Population Research Centre, Utkal University, Bhubaneswar, Odisha, India

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***Correspondence:**
Dr. Manoranjan Mohapatra,
E-mail: manoranjanmohapatra.jnu@gmail.com

ABSTRACT

Background: Anemia is one of the important non-communicable diseases not only in India rather at world level. Significant amounts of anemia of different levels exist in India even if various programmes are implemented at central and state level to eliminate anemia. One of the important factors of anemia is food practices, say nutritional practices of population. In this context, it is necessary to understand the relationship of anemia of different levels and food practices among children and women in India across national family health survey datasets.
Methods: A cross-sectional study design with quantitative technique like bi-variate analysis is done to understand the objectives using the last three rounds of national family health survey.
Results: The results find that children and women with non-consumption of vegetarian foods had more prevalence of anemia of different levels and simultaneously both consumption and non-consumption of non-vegetarian foods had more prevalence of anemia of different levels among children and women. Besides, culture had an impact in deciding food practices at the same time there was a cultural shift of food practices among children and women in India.
Conclusions: The author suggests dissemination of proper scientific information like millets and other vegetarian foods along with vegetables and fruits of vitamin-C should be eaten to improve iron absorption, is the solution for both prevention and elimination of anemia instead of myths and mis-information.

Keywords: Anemia, Non-communicable diseases, Public health, Food practices, Vegetarian and non-vegetarian foods, Culture, Individual choice

INTRODUCTION

The prevalence of non-communicable diseases is increasing in India while communicable diseases are still persisting with ongoing demographic and epidemiological transition in India, as per the report of fifth round of National Family Health Survey (NFHS). Anemia is one of the non-communicable diseases with public health concerns not only in India rather at world level. As per world health organization, 40% of children of 6-59 months of age, 37% pregnant women, 30% of women of 15-49 years of age are anemic in the world level. According to fifth round of national family health survey, the proportion of anemia among children, women and men are 67%, 57% and 25% respectively in India. As per the latest NFHS data, a high level of anemia exists in India and its elimination should be the top priority. As per research by Dr. Manoranjan Mohapatra, the strategy to eliminate anemia is to focus on children, women and men with an increasing trend of anemia of different levels among different states. Besides, focus should be on socio-economic and demographic groups particularly the common groups of children and women like mothers and women not expose to mass media and poorest level of wealth in India.[1] The important policy prescription to eliminate anemia is to create proper awareness on prevention and treatment of anemia through scientific messages using mass media.[1] Though there are many factors responsible for anemia but one of the important factors of anemia is food practices, say nutritional

practices of the population as per fifth round of national family health survey report. In this context, it is necessary to understand the relationship between food practices and anemia of different levels among children and women in India across NFHSs. More specifically, the objectives are to understand the prevalence of anemia of different levels among food practices of children and women in the last round, say fifth round of NFHS of India and also assess the pattern of anemia of different levels among food practices of children and women across NFHS datasets of India.

METHODS

To understand these objectives, a cross sectional study design with quantitative technique like bi-variate analysis has done across NFHS. Bi-variate analysis finds the prevalence of anemia of different levels among food practice/consumption of children and women in India and also understands the relationship between dependent and independent variable. The dependent variables are prevalence of anemia of different levels among children and also prevalence of anemia of different levels among women and the independent variable is food consumption of India. Food consumption is divided as vegetarian and non-vegetarian food and the consumption of food is coded as never, occasionally, weekly and daily. The different rounds of national family health survey (NFHS), prepare as per demographic health survey (DHS), are used for this study and international institute for population science (IIPS) is the nodal agency for the entire process. The first, second, third, fourth and fifth rounds of NFHS reports were published in 1992-93, 1998-99, 2005-06, 2015-16, 2019-21 respectively. SPSS-20 software is used for bi-variate analysis. Anemia data were collected in second round of NFHS however more specifically anemia with different levels like mild, moderate and severe anemia were collected from third round of NFHS. Men's data on socio-economic and demographic groups were not collected across NFHS. So the study is only limited to children and women and third to fifth rounds of NFHS. As per NFHS-5, the samples for mild, moderate and severe anemic children were 58350, 69118 and 5512 respectively. As per NFHS-4, the samples for mild, moderate and severe anemic children were 104004, 36475 and 2685 respectively. As per NFHS-3, the samples for mild, moderate and severe anemic children were 18348, 7705 and 835 respectively. As per NFHS-5, the samples for mild, moderate and severe anemic women were 173893, 195685 and 81221 respectively. As per NFHS-4, the samples for mild, moderate and severe anemic women were 263132, 82490 and 6950 respectively. As per NFHS-3, the samples for mild, moderate and severe anemic women were 41749, 15138 and 1763 respectively.

RESULTS

The result section is the analysis of anemia of different levels with food consumption among children and women of India using quantitative technique and also different rounds of NFHS data sets.

The results (Tables 1-3) show children belong to moderate anemia with consumption of non-vegetarian foods and women belong to mild anemia with consumption of vegetarian foods had similar pattern of food practices in India throughout third to fifth rounds of NFHS and the other groups had not similar pattern. As per the last round of NFHS, non-consumption of vegetarian foods had more mild and severe anemia among children whereas consumption of vegetarian foods occasionally had more moderate anemia among children in India. Consumption of non-vegetarian foods daily had more mild anemia among children whereas non-consumption of non-vegetarian foods had more moderate and severe anemia among children in India in the last round of NFHS. Consumption of vegetarian foods occasionally had more mild, moderate and severe anemia among women and consumption of non-vegetarian foods weekly, occasionally and never had more mild, moderate and severe anemia respectively among women in India in the last round of NFHS.

Table 1: Prevalence of anemia of different levels and food practices among children in India across the NFHSs.

Food practices	NFHS-3			NFHS-4			NFHS-5		
	Mild	Moderate	Severe	Mild	Moderate	Severe	Mild	Moderate	Severe
Vegetarian									
Never	50.0	50.0	0.0	22.7	6.8	4.5	31.6	10.5	5.3
Daily	35.5	11.4	1.1	38.1	11.7	0.7	26.1	27.0	2.0
Weekly	37.1	14.2	1.5	39.8	13.6	0.9	25.7	29.5	2.3
Occasionally	38.2	16.8	1.8	41.2	14.7	1.1	26.2	31.8	2.6
Non-vegetarian									
Never	37.3	16.7	1.7	40.5	14.7	1.2	25.8	31.1	2.7
Daily	41.6	10.4	1.8	39.4	12.2	0.9	26.8	27.1	2.1
Weekly	37.6	14	1.4	40.7	13.4	0.8	26.4	30.6	2.2
Occasionally	38.0	16.1	1.8	40.8	14.4	1.1	25.9	30.8	2.4

Sources: Computed from data files of NFHS-3, NFHS-4 and NFHS-5

Table 2: Prevalence of anemia of different levels and food practices among women in India across the NFHSs.

Food practices	NFHS-3			NFHS-4			NFHS-5		
	Mild	Moderate	Severe	Mild	Moderate	Severe	Mild	Moderate	Severe
Vegetarian									
Never	27.3	18.2	9.1	31.5	21.9	5.5	20.5	20.5	2.3
Daily	33.1	10.7	1.2	36.1	10.8	0.8	24.5	25.5	2.2
Weekly	34.9	12.0	1.4	37.2	11.7	0.9	24.9	27.5	2.6
Occasionally	36.5	13.7	1.6	39.1	12.3	1.1	25.4	29.1	2.7
Non-vegetarian									
Never	35.2	13	1.5	38.6	12.3	1.0	24.9	28.2	2.8
Daily	34.6	11.7	1.9	36.4	10.6	0.8	25.1	27.9	2.3
Weekly	35.5	12.5	1.6	38.0	11.6	0.9	25.6	28.3	2.5
Occasionally	36.2	13.2	1.5	38.5	12.1	1.1	25.1	28.5	2.7

Sources: Computed from data files of NFHS-3, NFHS-4 and NFHS-5

Table 3: Pattern of high prevalence anemia of different levels and food practices among children and women in India across NFHS datasets.

	Children			Women		
	NFHS-3	NFHS-4	NFHS-5	NFHS-3	NFHS-4	NFHS-5
Mild						
Vegetarian	Never	Occasionally	Never	Occasionally	Occasionally	Occasionally
Non-vegetarian	Daily	Occasionally	Daily	Occasionally	Never	Weekly
Moderate						
Vegetarian	Never	Occasionally	Occasionally	Never	Never	Occasionally
Non-vegetarian	Never	Never	Never	Occasionally	Never	Occasionally
Severe						
Vegetarian	Occasionally	Never	Never	Never	Never	Occasionally
Non-vegetarian	Occasionally	Never	Never	Daily	Occasionally	Never

Sources: Computed from data files of NFHS-3, NFHS-4 and NFHS-5

DISCUSSION

India is a country with large chunk of population divided by various geographies, religion, castes, tribes and also various other groups and every large groups are also sub-divided by various sub-groups.[2] Both food and food practices among people have changed time to time, region to region, states to states, groups to groups and lastly individuals to individuals. Research evidences show food practice or food choice is a multi-factorial and influenced by time, geographies, population groups and also individual-based motives.[3,4] The results highlights that children and women with non-consumption of vegetarian foods had more anemia of different levels and simultaneously both consumption and non-consumption of non-vegetarian foods had more anemia of different levels among children and women. Another important finding is that mostly food practices among children and women had changed across the NFHS however some groups had continuing the food practices across the data sets, maintaining their culture. Research also finds culture had an important role in deciding anemia while cultural shift of anemia among groups also observed in Odisha.[5] Research evidences show that though vegetarian diet contain an equivalent amount of iron but animal based hemoglobin iron is better absorbed (15-40 percentage absorption) compared with plant based non-hemoglobin iron (1-15 percentage absorption).[6] So as per research, people those are herbivores are more likely to anemic than carnivores and omnivores.[7] As food consumption is an individual choice and also relates to culture, both vegetarians and non-vegetarians can practice their food and a particular food behaves differently among population, though not always, even among the statistically the most homogeneous groups. Similar study also highlighted that food choice decisions are described as being recurrent, multi-faceted, contextual, dynamic and complex which result in different forms of food behaviors.[3] However mere practicing the foods is not the solution to anemia rather proper scientific information should be provided to people like what should be consumed along with foods, particularly in vegetarian foods.[1] Vegetarians can use soybean the easily absorbed food similar to meat or iron sulphate tablets to improve iron intakes.[8] Even literatures highlight consumption of processed grains improve the bio-accessibility of iron than those un-processed control grains.[9] Besides, consumption of tea with meals should be avoided as it may interfere in iron absorption.[7] Various food myths, taboos and beliefs like millets (traditional foods of tribes), vegetables like moringa leaves, drumsticks, beet roots, raw banana etc. are to be eaten to improve iron across various communities in India.[10,11] Besides, a lot of mis-information on foods is also

spreading in media and social media like certain foods can cure diseases.[11] Even people from both medical and non-medical communities, are also practicing and also advising these myths.[10-12] Research also found doctors are less specialized in providing nutrition care.[13] Even research highlighted the existence of relationship between belief in food myths and the incidence of anemia.[14] However, in reality to improve iron absorption, particularly vegetables and fruits with vitamin-C, are required along with millets and other vegetarian foods.[9,15,16] So, proper scientific messages regarding foods, keeping in view of food culture of individuals, should be disseminated among population of India for both prevention and elimination of anemia.

CONCLUSION

To conclude, mere practicing the foods either through individual choice or culture or myths or advices from people of medical and non-medical community is not the solution for elimination of anemia rather, particularly in vegetarian food, to improve iron absorption, vegetables and fruits with vitamin-C are required along with millets and other vegetarian foods. Lastly, dissemination of this scientific information like what to consume along with food, is the solution for both prevention and elimination of anemia.

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