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Consumption of iron rich foods among women of reproductive age

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Abstract: Anemia in women of reproductive age is a major public health challenge for low- and middle-income countries with a long-term adverse impact on the health of women, their children, and the economic growth of the society. The present was aimed to know the consumption of iron-rich foods among women. The information regarding the food frequency consumption of green leafy vegetables, non-vegetarian foods, dry fruits, and symptoms related to anemia were collected using the questionnaire. The questionnaire was framed in Google form and the link was sent to the female population through WhatsApp and around 125 respondents submitted the forms completely. Incomplete forms were excluded from the study. It was found that consumption of green leafy vegetables was low as only three percent and two percent of the participants consumed moringa leaves and agathi daily. Only seven percent and five percent of the respondents included palak and amaranth leaves weekly thrice in their diet. Also, 48% and 44% of the participants reported that they never consumed organ meats like blood and brain. Nearly 28% and 34% of the study participants never consumed Figs and Apricots. Regarding the symptoms of anemia, 32±6.8 female respondents claimed to have fatigue/tiredness, 9±1.4 of them reported that they had pale skin, 8±1.8 had shortness of breath, 8±2.2 with light-headedness, 9±2.6 had dizziness and 7±1.6 had palpitations/fast heartbeat. The essential goal for every woman is to have none of the given symptoms or iron deficiency disorders so that none of the women suffers since it is easily prevented just through spreading awareness and neglecting this can pose life-threatening conditions.

Key words: anemia, consumption, food frequency, iron-rich foods, symptoms

INTRODUCTION

India's 94th rank in the 2020 Global Hunger Index (2021) out of 107 reflects the rampant undernourishment in the country. While the economy has witnessed rapid growth in the past decades, improvements in nutrition status have been relatively steady, and hence, the need for substantial breakthroughs remains. A critical aspect of this public health challenge is the anemia burden on women in India, recording one of the world's highest (Sharma, 2021).

According to the National Family Health Survey 2015-2016 [NFHS-4] data, approximately half of total women in India suffer from anemia of some kind (mild, moderate, or severe), which is not a significant improvement from the NFHS-3 [2005-6] findings (Ministry of Health and Family Welfare [MoHFW] 2017). While severe and moderate anemia has seen a fall, cases of mild anemia have increased. Such a condition can have serious physical, social, and economic consequences as it leads to fatigue, stress, and diminished productivity

Iron deficiency is common in women of reproductive age because of their high demand for iron during pregnancy, lactation, menstrual blood loss, and nutritional deficiencies during their reproductive cycle (Mawani et al., 2016). Iron is a key nutrient that ensures proper growth and functioning of the body and promotes the production of proteins that transport oxygen and regulate cell development. Iron is responsible for carrying oxygen to your muscles and brain. If the consumption of iron is not enough in diet, the energy-using efficiency of the body will be affected. Iron helps improve focus and concentration levels, reduces irritability, and enhances stamina. Proper iron intake is particularly important for individuals who lead an active lifestyle, as it boosts athletic performance. Since iron produces red blood cells that contain hemoglobin, which transfers oxygen to the tissues, its deficiency may lead to poor performance during physical strain.

The Recommended Daily Allowance (RDA) varies between ages, but women who are pregnant require the most. Iron promotes healthy pregnancy, increased energy, and better athletic performance. Iron deficiency is most common in female athletes. Canned clams, fortified cereals, and white beans are the best sources of dietary iron. Too much iron can increase the risk of liver cancer and diabetes. Women need more iron than men to make up for the amount of iron they lose in their menstrual period. Around 1 mg of iron is lost for every day of bleeding. Iron deficiency is the most common nutrient deficiency in women. Insufficient iron can lead to anemia. Common symptoms of anemia include tiredness and breathlessness. Iron is especially important during pregnancy. Iron absorption can be impaired by very high-fibre diets, alcohol, the tannic acid in tea, and concentrated sources of calcium.

Heme and non-heme iron are the two types of iron. Heme iron is found in meat, fish, and poultry. It is the form of iron that is most readily absorbed by the body, up to 30 percent of the heme iron consumed will be absorbed. Eating meat

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generally boosts iron levels far more than eating non-heme iron. Non-heme iron is found in plant-based foods such as fruits, vegetables, and nuts. Foods with non-heme iron are still an important part of a nutritious, well-balanced diet, but the iron contained in these foods won't be absorbed as completely, only between two and 10 percent of the non-heme iron that is consumed will be absorbed. Consumption of heme iron with foods higher in non-heme iron, iron will be more completely absorbed by the body. Foods high in vitamin C like tomatoes, citrus fruits, and red, yellow or orange peppers help with the absorption of non-heme iron (Taneja et al., 2020).

Anemia in women of reproductive age is a major public health challenge for low- and middle-income countries with a long-term negative impact on the health of women, their children, and the economic growth of the society. Even though the world health organization targeted a 50% global reduction of anemia among women of reproductive age by 2025, with the current trend it is unlikely to achieve this goal. The most common type of anemia worldwide is nutritional anemia mainly due to iron, folate, and vitamin B12 deficiencies. Iron deficiency anemia is the most common cause of anemia, with over 50% of anemia being due to iron deficiency.

Nutritional anemia due to iron deficiency is the most common cause of anemia in India. The average diet in India is low in iron and mostly of vegetable origin. Hence the present was conducted to know the consumption of iron-rich foods among women.

METHODOLOGY

The study took place at Coimbatore from November 2022 to February 2022 and the study participants were females between 20 to 40 years of age. Females who were less than 20 years of age or greater than 40 years of age were excluded. The information regarding the food-frequency of green leafy vegetables, non-vegetarian foods, dry fruits, and symptoms related to anemia was collected using the questionnaire. The questionnaire was framed in Google form and the link was sent to the female population through WhatsApp, around 125 respondents submitted the forms completely. Incomplete forms were excluded from the study. The received responses were analyzed using Microsoft Excel sheets and the results were expressed in percentage, mean with standard deviation. Association between intake of iron-rich foods and clinical symptoms were analyzed.

RESULTS AND DISCUSSION

1. Background information

Around 43% of the participants belong to the age group of 20 to 25years, 32% comes under 25 to 30 years, 13% were between 30 to 35 years, and 12% from 35 to 40 years. Almost all the respondents were educated, either graduated or pursuing graduation. All the selected participants were non-vegetarians with no food allergies.

2. Consumption frequency of green leafy vegetables

Green leafy vegetables hold an important place in well-balanced diets. Green leafy vegetables are the cheapest of all the vegetables within the reach of poor men, being the richest in their nutritional value. The lack of knowledge especially on the nutritive value of these green leafy vegetables among the public in general is the main drawback in their lower consumption. The frequency of consumption pattern for green leafy vegetables was analyzed for the study participants and given in the below table.

Table 1
Consumption frequency of green leafy vegetables

FF / GLV	Daily		Weekly Thrice		Weekly Once		Monthly Once		Rarely		Never	
	No	(%)	No	(%)	No	(%)	No	(%)	No	(%)	No	(%)
Agathi	2	2	5	4	15	12	40	32	25	20	38	30
Palak	0	0	8	7	17	14	34	27	28	22	38	30
Moringa Leaves	4	3	22	18	45	36	28	22	10	8	16	13
Spinach	1	1	15	12	38	30	30	24	8	7	33	26

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Amaranth	0	0	5	4	52	41	22	18	38	30	8	7

From the above table it was clear that daily consumption of green leafy vegetables was low as only three percent and two percent of the participants consumed moringa leaves and agathi respectively. Only seven percent and five percent of the respondents included palak and amaranth leaves weekly thrice in their diet. Nearly 26% of them never consumed spinach. This shows that women consume quite fewer amounts of green leafy vegetables on daily basis. There would be a vast change in the health status if there would be an increase in the green leafy vegetables on a daily basis which can prevent women from iron deficiency disorders which is life-threatening.

Stuetz et al., (2019) reported in their study that the amount of dark green leafy vegetables (DGLV) consumed was the main determinant of vitamin A and iron intake by women in Chamwino and corresponded to higher hemoglobin, serum retinol and iron status than in the villages of the Kilosa district; in agreement, DGLV consumption also predicted iron and vitamin A intake in Kilosa district. DGLV consumed with wholemeal millet was advantageous regarding women's vitamin A and iron intake and status over the predominantly maize-rice-based diet lacking vegetables.

3. Food frequency of non-vegetarian foods

Organ meats are nutrient-dense. They are a good source of iron and protein and packed with vitamin A, B12, and folate, in addition to many nutrients. Many organ types of meat, including the liver, kidneys, and heart, are high in zinc. Zinc is essential for your immune system to work properly. Non-vegetarian diet plays a significant role in the non-occurrence of anemia as the rate of its prevalence is higher among the individuals who consume a vegetarian diet (Mahajani and Bhatnagar, 2015).

Table 2

Consumption frequency of non-vegetarian foods

FF / NVF	Daily		Weekly thrice/twice		Weekly once		Monthly once/twice		Rarely		Never	
	No	%	No	%	No	%	No	%	No	%	No	%
Liver	0	0	16	13	8	6	28	22	36	29	37	30
Spleen	0	0	6	5	16	13	10	8	44	35	49	39
Intestine	0	0	4	3	4	3	15	12	44	35	58	47
Blood	0	0	1	1	6	5	16	13	46	37	56	44
Brain	0	0	1	1	1	1	8	6	55	44	60	48

Among the participants none of them consumed non-vegetarian foods daily though they were non-vegetarians. Consumption of liver was found to be 13%, spleen five percent, intestine three percent, and blood only one percent weekly twice. Though the organs meats offer some of the densest sources of nutrients, 30% and 39% of the respondents never consumed liver and spleen respectively. Also, 48% and 44% of the participants reported that they never consumed blood and brain.

4. Food frequency of dry fruits

Dried fruits like prunes, raisins, and apricots are good sources of iron. 100 grams of prunes contain 0.93 mg of iron while raisins contain 2.6 mg of iron. Apricots have 6.3 mg of iron per 100 grams.

Table 3

Consumption frequency of dry fruits

FF / NVF	Daily		Weekly thrice/twice		Weekly once		Monthly once/twice		Rarely		Never	
	No	%	No	%	No	%	No	%	No	%	No	%
Raisins	32	26	25	20	19	15	15	12	14	11	20	16

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Dates	34	27	31	25	28	22	12	10	11	9	9	7
Figs	9	7	15	12	17	14	21	17	28	22	35	28
Apricots	6	5	5	4	11	9	21	17	39	31	43	34

It is necessary that women should consume dry fruits frequently to maintain the iron levels close to normal which will prevent women from any sort of iron deficiency disorders like anemia. From the present study, it was noted that 26% and 27% of the respondents consumed Raisins and Dates daily respectively. Figs were consumed daily by seven percent and Apricot by five percent of the participants. Around 25% of the respondents consumed Dates weekly thrice or twice. Nearly 28% and 34% of the study participants never consumed Figs and Apricots.

5. Symptoms of anemia

Fatigue, skin pallor, shortness of breath, light-headedness, dizziness, or palpitation/fast heartbeat are the most common symptoms of anemia. The study participants were asked about the above symptoms to conclude that they were anemic. Among the 125 participants, 38% (48) reported that they had no symptoms. The below table represents the details of the prevalence of anemic symptoms among the 77 study participants.

Table 4
Symptoms of anemia among the study participants

Symptoms of Anemia	**No of Participants (n=77) Mean ± SD**
Fatigue/Tiredness	32 ± 6.8
Pale skin	9 ± 1.4
Shortness of breath	8 ± 1.8
Lightheadedness	8 ± 2.2
Dizziness	9 ± 2.6
Palpitations/Fast heartbeat	7 ± 1.6

A study was conducted by Osborn et al., (2021) to find the prevalence of anemia and factors influencing it among non-pregnant reproductive-aged women (15–49 years) in a rural area of Coimbatore. They estimated the prevalence of anemia as 64.8% (95% confidence interval: 60%–69%). Significant predictors for anemia among the study participants were less frequent intake of green leafy vegetables (adjusted odds ratio [AOR] = 3.65, confidence interval [CI]: 2.17–6.12), low socioeconomic status (AOR = 3.36, CI: 1.93–5.84), illiteracy (AOR = 3.09, CI: 1.09–5.24), birth spacing <2 years (AOR = 2.49, CI: 1.19–5.25), excessive menstrual bleeding (AOR = 2.27, CI: 1.09–4.76), and inadequate knowledge regarding anemia (AOR = 2.03, CI: 1.19–3.44).

In the present study nearly 32±6.8 female respondents claimed to have fatigue/tiredness, 9±1.4 of them reported that they had pale skin, 8±1.8 had shortness of breath, 8±2.2 with lightheadedness, 9±2.6 had dizziness and 7±1.6 had palpitations/fast heartbeat.

CONCLUSION

Anemia is a major public health problem among reproductive-aged women in India. Despite many programs implemented for decades to fight anemia, still, the prevalence of anemia is high because its associated factors vary among different regions. Though the majority of the women are educated, they were unaware of many factors regarding anemia, dietary sources of iron, folic acid, and vitamins, and knowledge about hemoglobin levels. It is significant that women with no symptoms are higher compared to women with symptoms. The essential goal for every woman is to have none of the given symptoms or iron deficiency disorders so that none of the women suffers since it is easily prevented just through spreading awareness and neglecting this can pose life-threatening conditions.

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