



A STUDY ON DIETARY IRON INTAKE AND PREVALENCE OF IRON DEFICIENCY ANEMIA AMONG FEMALE OF REPRODUCTIVE AGE

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Abstract: Iron deficiency remains a significant public health issue in developed and developing countries alike, with over 30 percent of the global population affected. Over the long term, an individual consuming less than the recommended amount of iron may be more likely to develop iron deficiency anemia the condition usually appears when an individual's iron intake in their diet is lower than their physiological requirements. The study was conducted on female of reproductive age from 13-35years Hyderabad. The 100 sample were collected randomly. Their iron consumption was found out by 24-hour dietary recall for 3 consecutive days. A specially designed questionnaire was developed in order to create awareness and to know the knowledge of sample on iron rich foods and how often they consume iron rich foods. The data collected was tabulated and analysed statistically using one sample t test and $p < 0.010$ is significant at $t = 0.010$. The study revealed that there is low iron consumption in many women and created awareness among female on iron rich foods and importance of iron in our body was explained during data collection to the samples.

Index Terms - iron, iron deficiency anemia, iron rich foods, dietary iron.

I INTRODUCTION

Iron is a vital nutrient which plays a key role in numerous physiological processes, including the movement and storage of oxygen, the generation of oxidative energy, deoxyribonucleic acid (DNA) synthesis, and electron transport. Although many healthcare advances have been made in recent years, iron deficiency remains a significant public health issue in developed and developing countries alike, with over 30 per cent of the global population affected. Over the long term, an individual consuming less than the recommended amount of iron may be more likely to develop iron deficiency anemia, a condition linked with further adverse health and lifestyle outcomes including an impaired capacity for work, a higher risk of infectious disease, higher risks of maternal and child mortality, lower birth weight and preterm delivery, and potential delays to infants' and young children's growth and development. Hence, a reduced prevalence of iron deficiency anemia and ultimately the prevention of this condition would have multifaceted positive effects on human health, development and quality of life generally, and should therefore be a high priority in monitoring and interventions with regard to the public. Iron deficiency can be developed at any stage of the human life cycle, but some population subgroups face a particularly high risk of developing iron deficiency. For example, women of childbearing age have a higher risk because of their body's high demand for iron during pregnancy and lactation, and also because of blood loss during menstruation. Menstruation is one of the main causes of iron deficiency in women, and an inverse relationship has been found to exist between a woman's menstrual flow and her serum ferritin levels. More specifically, daily blood loss during menstruation can vary from around 4–10ml, an amount equivalent to an iron loss of between 2.5mg and 10mg/day and which means that women need higher daily iron intakes than men, but prior research has nevertheless found that women's iron intakes are usually lower than the recommended level of intake. This means that a high frequency of anemia among young women is unsurprising. A sufficient level of dietary iron which also provides the necessary bioavailability to satisfy the body's demands is particularly vital during this time of life. Even though the causation of iron deficiency is complex, the condition usually appears when an individual's iron intake in their diet is lower than their physiological requirements, therefore, people who have iron deficiency anemia may not consume enough iron because their diet is either of poor quantity and/or quality, especially in developing countries. Further, individuals' diets in developing countries generally lack adequate iron because of high food costs, restricted access to fresh and suitable foods, and an often-limited understanding of nutrition. Research focusing on dietary iron intake and iron providing food sources is of use to, physicians, health educators, dieticians, and policy makers as it helps to build a more comprehensive understanding of which foods drive the iron intakes of particular population groups so that suitable advice and strategies can be designed to improve the iron intakes of individuals at high risk of iron deficiency anemia. With this in mind, which has to assessed dietary iron intake and explored its effect on young women's iron status, the study investigates the iron intakes, of female. This survey should found out by a 24-hour dietary recall of each participant which involved gathering information on all foods and beverages they had consume for past 3 consecutive days.

1.1 HOW MUCH IRON DO WE ABSORB FROM OUR DIET?

How much iron you absorb from our diet depends on how much iron our body is storing.

The healthy body absorbs around 18% of the available iron from a typical western diet (which includes animal foods) and about 10% from a vegetarian diet. However, we may be absorbing much less than that, even if our diet includes iron-rich foods.

The most significant influence on iron absorption is the amount of iron already stored in our body. The body stores iron in various places, including the liver. If our stores are high, our body absorbs less iron from the foods you eat. Conversely, low iron stores increase our ability to absorb iron.

1.2 DIETARY FACTORS AFFECTING IRON ABSORPTION

Certain foods and drinks affect how much iron our body absorbs.

To boost iron absorption:

- Consume vitamin C (found in fruits and vegetables).
- Include animal protein (haem) with plant (non-haem) sources of iron, such as meat with beans – for example, beef and kidney beans in a chilli con carne.
- Cook plant sources of iron (such as vegetables). In most cases, cooking increases the amount of available non-haem iron in vegetables. For example, the body absorbs 6% of the iron from raw broccoli, compared to 30% from cooked broccoli.

Foods and drinks that reduce your body's ability to absorb iron:

- Soy proteins can reduce absorption from plant sources.
- Tea, coffee and wine contain tannins that reduce iron absorption by binding to the iron and carrying it out of the body.
- Phytates and fibres found in wholegrains such as bran can reduce the absorption of iron and other minerals.
- Inadequate vitamin A in your diet could lead to iron deficiency because vitamin A helps to release stored iron.
- Calcium and phosphorus reduce the absorption of plant-sourced (non-haem) iron.

1.3 IRON DEFICIENCY ANEMIA

Iron deficiency anemia is a common type of anemia — a condition in which blood lacks adequate healthy red blood cells. Red blood cells carry oxygen to the body's tissues.

As the name implies, iron deficiency anemia is due to insufficient iron. Without enough iron, your body can't produce enough of a substance in red blood cells that enables them to carry oxygen (haemoglobin). As a result, iron deficiency anemia may leave you tired and short of breath. Iron deficiency anemia can usually correct with iron supplementation. Sometimes additional tests or treatments for iron deficiency anemia are necessary, especially if doctor suspects that patient bleeding internally.

1.4 SYMPTOMS

Extreme fatigue, Weakness, Pale skin., Chest pain, fast heartbeat or shortness of breath, Headache, dizziness or light-headedness, Cold hands and feet, Inflammation or soreness of your tongue, Brittle nails, unusual cravings for non-nutritive substances, such as ice, dirt or starch, Poor appetite, especially in infants and children with iron deficiency anemia.

1.5 CAUSES

Blood loss, A lack of iron in your diet, an inability to absorb iron, Pregnancy.

1.6 RISK FACTORS

Women, infants and children, vegetarians, frequent blood donors.

1.7 COMPLICATIONS

Heart problems, problems during pregnancy, growth problems.

1.8 DIAGNOSIS

To diagnose iron deficiency anemia, doctor may run tests to look for: red blood cell size and colour, Haematocrit, Haemoglobin, Ferritin.

1.9 TREATMENT

IRON SUPPLEMENTS Take iron tablets on an empty stomach, don't take iron with antacids, Take iron tablets with vitamin C.

II AIM AND OBJECTIVES

2.1 AIM

In the light of above literature, the Aim of the present study is

To study on dietary iron intake and prevalence of iron deficiency anemia among female of reproductive age.

2.2 OBJECTIVES

- To assess the iron intake and prevalence of iron deficiency anemia among female of reproductive age
- To assess the nutritional status of sample.
- To create awareness about iron rich foods and their consumption among these women

III REVIEW OF LITERATURE

A study was conducted by, Charles Apprey et al. (2020) on Patterns of Dietary Iron Intake, Iron Status, and Predictors of Haemoglobin Levels among Early Adolescents in a Rural Ghanaian District. One hundred and thirty-seven early adolescents were randomly selected in a rural district in Ghana. Multiple-pass 24-hour recall, iron food frequency questionnaire consisting of 27 food items, and semi structured questionnaire were administered the result revealed that meal skipping, guardian educational status, and number of times of eating a day were significantly associated with dietary iron intake. Meal skipping, snacking, and adolescents with JHS education were positively associated with anaemia.

A study was conducted by Nils Thorm Milman et al. (2019) on dietary iron intake in women of reproductive age search of dietary surveys reporting intake of iron. 49 dietary surveys/studies in 29 European countries were included. In most countries, the majority of women had a dietary iron intake below 15 mg/day. In Belgium, Denmark, Hungary, and Sweden, 91-95% of women had an intake below 15 mg/day. In Ireland and Germany, 61-78% had an intake below 15 mg/day. In Europe, 61-97% of women have a dietary iron intake below 15 mg/day. This study revealed that low iron status in many women.

A study was conducted by Riyadh A Alzaheb et. al (2017) This study therefore explored the iron intake, dietary iron sources and iron status of female Saudi university students in Tabuk, Saudi Arabia. A cross-sectional study of dietary consumption and iron status used a sample of 200 apparently healthy female students (19-25 years old) analyses showed that the prevalence of iron deficiency and iron deficiency anemia were 50.0 per cent and 12.5 per cent respectively. All had lower Vitamin C consumption than recommended, the study revealed that Women of childbearing age face a higher iron deficiency risk.

A study was conducted by Joanna Slazak et. al (2017) the aim of this study was to assessing of an iron dietary intake in a group of young polish women of Poland. 75 sample was collected aged 20-30 years. The methods used to study is 24 dietary recall for 3 days and questionnaire the study was to analyse a designed brief iron dietary intake questionnaire based on a food frequency assessment, Participants conducted 3-day dietary records (FFQ1—directly after the dietary record and FFQ2—6 weeks later). The analysis done revealed the low iron intake in sample

A study was conducted by Queen Margaret University (2015) to assess iron intake in female university students and compare to the Dietary Reference Values and National Diet Nutritional Survey. Additionally, to make recommendations based on the findings how students could improve their iron intake. his study involved 12 female students, aged 18 to 30, who are studying at Queen Margaret University. Anthropometrics measures were carried out, and a four-day diet diary was used to collect dietary information. 30% of students were below the Lower Reference Nutrient Intake. Only 20% of them met the Reference Nutrient Intake for mean iron intake

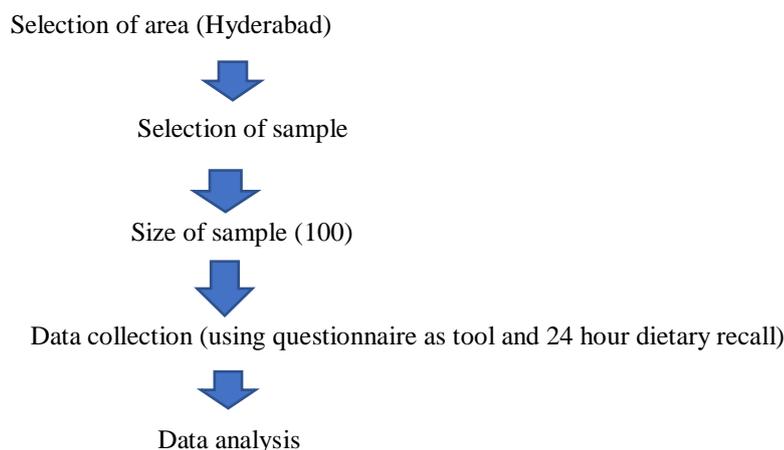
IV METHODOLOGY

Methodology is a significant part of any research study, which enables the research to produce a blue print of the research undertaken.

Methodology of present study is discussed under the following heads-

- Research design
- Selection of area
- Size of sample
- Data collection
- Data analysis

4.1 RESEARCH DESIGN: Analytical, Design of the study is in the following flow chart.



4.2 RESEARCH APPROACH: Descriptive study

4.3 SELECTION OF AREA: A descriptive study performed on females of reproductive age from different zones of Hyderabad.

4.4 SELECTION OF SAMPLE: female of reproductive aged from 15-35 years.

4.5 DURATION OF STUDY: The Study has been carried for a period of 2 months.

4.6 COLLECTION OF DATA:

Questionnaire: The questionnaire contains general information, anthropometric measurements, questions regarding knowledge of symptoms, causes and prevention of anemia. It also contains the information on awareness of iron rich foods and foods which enhance and effect on iron absorption, information on physical activity and menstrual cycle. The questionnaire contains both open ended and close ended questions.

24-hour-dietary recall: 24-hour-dietary recall of samples was taken for 3 consecutive days.

4.7 DATA ANALYSIS: The collected data was tabulated and calculated by using statistical formula, one sample t- test, and it is a alternate hypothesis.

FORMULA:

$$t = \frac{\bar{X} - \mu}{\frac{S}{\sqrt{n}}}$$

Where,

\bar{X} is the sample mean,

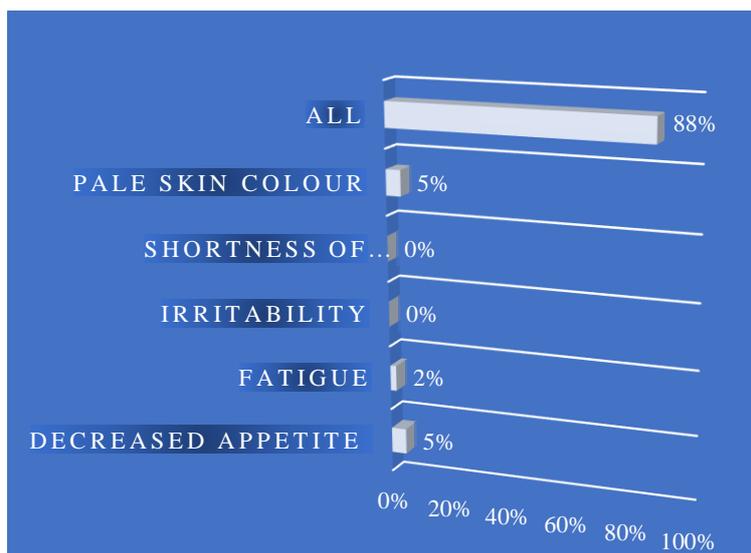
μ is the hypothesized population mean,

S is the standard deviation of the sample and

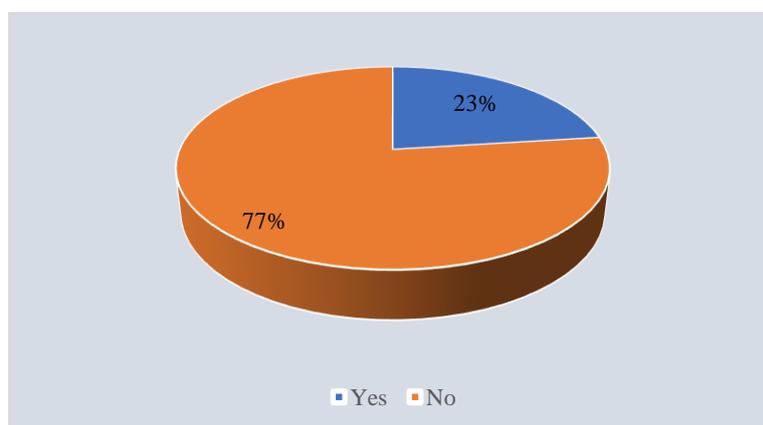
n is the number of observations in the sample

V RESULT AND DISCUSSION

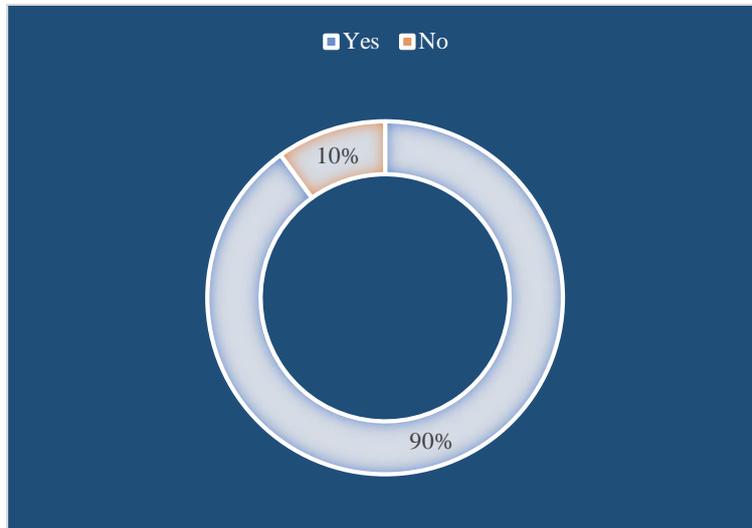
5.1 FIGURES:



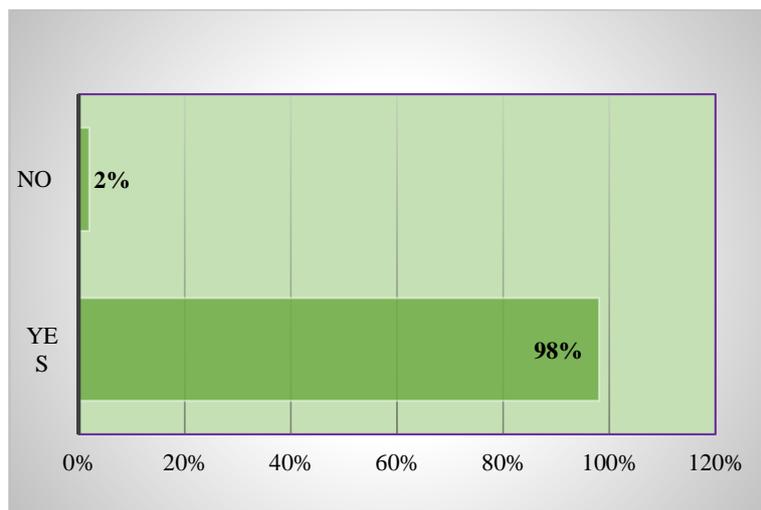
5.1 The above figure shows symptoms of anemia



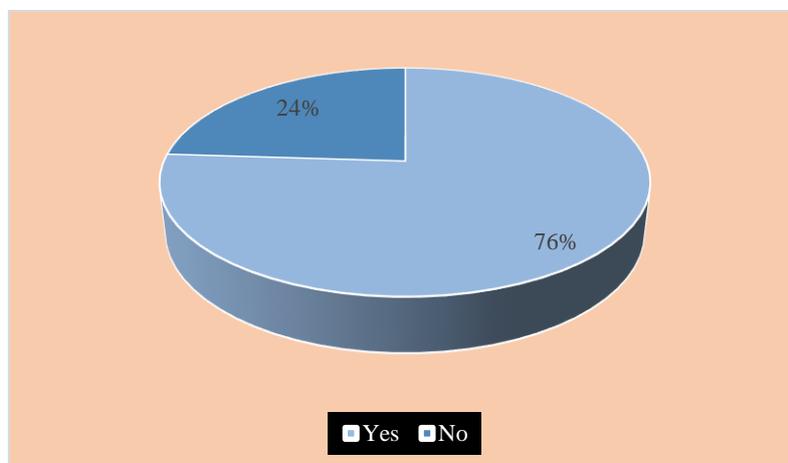
5.2 The above figure shows female suffering from symptoms



5.3 The above figure shows inclusion of iron rich foods in diet



5.4 The above figure shows inclusion of green leafy vegetable in diet.



5.5 The above figure shows consumption of organ meats

5.2 TABLES:**5.1 The below table shows prevention of iron deficiency anemia**

Category	Frequency	Percentage (%)
Increase dietary intake	20	20%
Avoiding post meal tea and coffee	4	4%
Consumption of vitamin C rich foods	2	2%
all	74	74%

5.2 The below table shows vitamin c foods helps in iron absorption

Category	Frequency	Percentage (%)
Yes	87	87%
No	13	13%

5.3 The below table shows consumption of iron rich foods

Food Item	Daily	Once week	Twice a Week	Monthly	Yearly	Never
Brown rice	22	15	4	7	3	49
Pomegranate	12	42	17	21	2	6
Apple	28	44	20	6	1	1
Kiwi	7	32	15	33	10	3
Banana	100	-	-	-	-	-
Beetroot	16	34	16	25	8	1
Spinach	8	55	21	12	2	2
Red meat	30	39	15	7	3	6
Organ meat	6	32	16	18	4	24
Jaggery	21	28	13	23	8	7
Dates	27	32	14	23	3	1
Almonds	38	28	17	12	4	1
raisins	24	34	21	18	2	1

5.4 The below table shows inclusion of iron supplements

Category	Frequency	Percentage (%)
Herbal products	11	11%
Tablets (Multivitamin)	11	11%
Milk powders	30	30%

5.5 The below table shows sample suffering from PCOD

Category	Frequency	Percentage (%)
Yes	13	13%
No	87	87%

VI SUMMARY AND CONCLUSION

Iron deficiency can be developed at any stage of the human life cycle, but some population subgroups face a particularly high risk of developing iron deficiency. For example, women of childbearing age have a higher risk because of their body's high demand for iron during pregnancy and lactation, and also because of blood loss during menstruation. Menstruation is one of the main causes of iron deficiency in women, and an inverse relationship has been found to exist between a woman's menstrual flow and her serum ferritin levels. More specifically, daily blood loss during menstruation can vary from around 4–10ml, an amount equivalent to an iron loss of between 2.5mg and 10mg/day and which means that women need higher daily iron intakes than men, but prior research has nevertheless found that women's iron intakes are usually lower than the recommended level of intake. This means that a high frequency of anemia among young women is unsurprising. A sufficient level of dietary iron which also provides the necessary bioavailability to satisfy the body's demands is particularly vital during this time of life.

The Study was aimed to Assess iron intake and prevalence of IDA among women. A descriptive study was carried out on 100 samples. A well-structured questionnaire was used to gather information from samples. The samples were face to face interviewed and their general information, Anthropometric measurements were asked. Questions related to the knowledge of anemia, symptoms, causes were enquired. Their awareness on iron rich food, how often they include iron rich foods in their diets were asked. Their lifestyle pattern was enquired and dietary habits were also recorded using food frequency questionnaire. 24-hour-dietary recall for 3 consecutive days was also taken to know the iron intake of sample. The collected data depicts the following results

The first objective was to assess the iron intake and prevalence of iron deficiency anemia among female of reproductive age.

The iron intake was assessed by 24-hour-dietary recall for 3 consecutive days to know whether they are meeting the daily requirement through standard deviation. The result revealed that women were not meeting the daily iron requirement.

The next objective was to assess the nutritional status of sample

The nutritional status of sample was found by calculating BMI were 58% of women was found normal weight ,21% of women were underweight and 2% were obese.

The next objective was to create awareness about iron rich foods and their consumption among these female

The awareness on iron rich foods was done by food frequency questionnaire the number of questions were included regarding symptoms, causes, prevention on IDA, awareness on iron rich food and foods which enhance and effect iron absorption the following result revealed through questionnaire is 95% of women knows what are iron rich foods, 90% of women includes iron rich foods in there diet, 87% of women knows vit c foods enhance iron absorption and 85% of women knows avoiding tea and coffee after meal improves iron absorption, 86% of women include iron rich foods in their diet, 76% of women include organ meats in their diet, 14% of women eats organ meats daily and 24% of women eats organ meat weekly, 37% of women eats organ meat monthly and 21% of women does not consume organ meat. 75% of women knows the cheap alternative of iron rich foods 52% of women include iron supplements in their diet.

CONCLUSION: The collected data was tabulated and analyses by using the formula

$$t = \frac{\bar{x} - \mu}{\frac{S}{\sqrt{n}}}$$

one sample t- test the results show that the p value are($p < 0.010$) and is significant at t 0.010, hence, hypothesis is proved. Thus, concluded that there is low iron consumption in many women.

VII BIBLIOGRAPHY

<https://www.sciencedirect.com/science/article/abs/pii/S2212267221008315>

https://www.healthline.com/nutrition/increase-iron-absorption#TOC_TITLE_HDR_8

<https://www.mayoclinic.org/diseases-conditions/iron-deficiency-anemia/symptoms-causes/syc-20355034>

<https://www.hindawi.com/journals/jnme/2020/3183281/>

<https://pubmed.ncbi.nlm.nih.gov/31312532/>

<https://www.researchgate.net/publication/316704984> The dietary iron intake and iron status of female university students in Saudi Arabia

<https://pubmed.ncbi.nlm.nih.gov/28264423/>

<https://eresearch.qmu.ac.uk/handle/20.500.12289/8448?show=full>