ISSN 2456-3110
Vol 9 · Issue 6
June 2024

JAiMS
INTERNATIONAL

# Journal of Ayurveda and Integrated Medical Sciences

www.jaims.in

JAIMS

An International Journal for Researches in Ayurveda and Allied Sciences

Maharshi Charaka
Ayurveda

Indexed

Journal of
Ayurveda and Integrated Medical Sciences
ISSN 2456-3110
ORIGINAL ARTICLE June 2024

# Knowledge and awareness related to Anemia and its treatment; among the Non-Medico Population in the PCMC Region: A Cross-Sectional Survey Study

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## ABSTRACT

**Background:** Anemia, a significant public health concern, particularly among the young adult population aged 18-25 years, is a condition characterized by low hemoglobin levels and reduced red blood cells. **Objectives:** A cross-sectional survey study aimed to assess the knowledge and awareness regarding anemia and its treatment in non-medico population. **Material & Methods:** Data from ACS college of PCMC region were obtained by conducting a survey with 307 respondents from the target age group. The survey instrument consisted of validated closed-ended questionnaire designed to evaluate respondents' knowledge and practices concerning anemia. **Results:** The survey revealed a generally high level of awareness about anemia as a health issue caused by low iron levels and reduced red blood cell (RBC) counts. Most respondents (83.1%) identified the complete blood count (CBC) as the primary diagnostic test for anemia and recognized iron supplementation (86.6%) and blood transfusions (89.6%) as treatment options. However, gaps in knowledge were identified. The contributing factors, such as worm infestations (37.1%), heavy menstruation (78.5%), and dietary deficiencies (14%), are not widely understood. The survey also highlighted societal biases, with 68.4% perceiving anemic adolescent girls as physically feeble. Regular hemoglobin monitoring and deworming medication intake practices were limited. **Conclusion:** Anemia awareness was relatively high among the studied population, targeted educational efforts could enhance the understanding of its multifactorial causes, symptoms and treatment. Identified knowledge gaps like misconceptions and biases can lead to improved anemia prevention. Regular hemoglobin monitoring and increasing access to deworming medication could be valuable interventions.

**Key words:** *Anemia, Iron deficiency, hemoglobin, Folic acid, CBC, Menstrual blood loss, Intestinal worm infestation*

## INTRODUCTION

Anemia is a common blood disorder that many people have heard of but may not fully understand. It is important for everyone, not just those in the medical field, to have basic knowledge about anemia since it can impact your overall health and well-being.[1]

Anemia occurs when your body does not have enough healthy red blood cells or hemoglobin, the protein in red blood cells that carries oxygen from your lungs to other parts of your body. Without sufficient oxygen-rich blood, people are likely to feel tired, weak, and short of breath.[2]

Anemia, a condition characterized by a lack of healthy red blood cells or hemoglobin, affects 7millions of people worldwide across all ages and demographics. The prevalence of anemia among the six groups according to the National Family Health Survey 5 (2019-21) was 25.0% in men (15-49 years) and 57.0% in women (15-49 years). A total of 31.1% of the

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Submission Date: 11/04/2024 Accepted Date: 24/05/2024

Access this article online

Quick Response Code

Website: www.jaims.in

DOI: 10.21760/jaims.9.6.6

ISSN: 2456-3110 ORIGINAL ARTICLE June 2024

participants were adolescent boys (15-19 years), 59.1% were adolescent girls, 52.2% were pregnant women (15-49 years), and 67.1% were children (6-59 months).[3] Although anemia is common, previous studies have suggested that there are significant gaps in public knowledge and awareness about this disorder and its causes, symptoms, and prevention strategies.[4],[5],[6] Inadequate understanding can lead to delayed diagnosis, improper self-treatment, and failure to make necessary dietary and lifestyle changes. This study aimed to evaluate the current state of anemia knowledge in a sample of nonmedical community members and to identify sociodemographic factors that may influence gaps in understanding.

## METHODS

### Study design and settings

This cross-sectional study was conducted at the Art, Science and Commerce College affiliated with the University of Pune from September 2023 to December 2023. The questionnaire was distributed to 385 nonmedical adults aged 18-60 years from the Art, Science and Commerce College, Pimpri, and Pune out of which 307 valid responses were further considered for analysis. The Participants completed an anonymous 26-item questionnaire developed after validation by experts in that field. The questionnaire was prepared in the English language based on a review of prior anemia knowledge surveys.[7]

To eliminate any kind of bias, the participants were selected from non-medico population.

### Data collection instruments and procedures

The data were collected using a Google Forms/Questionnaire. The questionnaire was developed from different studies and contextually adapted to the cultural norms of the study area.[7] The questionnaire instrument comprised multiple domains aimed at eliciting data pertaining to the respondents. The questions covered general anemia information, causes, symptoms, risk factors, preventive measures, and treatment options.

**Ethics approval and consent to participate:** Ethics approval was obtained for this study from the IEC reference No. DYPCARC/IEC/633B/2023, dated 28/02/2023, and written permission from the concerned authorities of the institutes was received before starting the survey study. Informed consent was obtained from participants. Participants were also informed that there would not be any risk as a result of their participation, and the confidentiality of the collected information would be maintained. They were also informed that they had the right to refuse or withdraw their participation at any time they wanted, and no harm could be imposed on them due to their refusal.

### Statistical analysis

The collected data were first checked for completeness and consistency. The data were then entered into EPI-info version 3.5 (software) and exported to the Statistical Package for Social Science (SPSS) version 21 for analysis.

## RESULTS

In the present cross-sectional survey study, only 307 participants completed the questionnaire and thereby were considered as valid and included for further analysis. This analysis revealed several important findings about anemia knowledge and awareness in this population. The vast majority (94.46%) of respondents were young adults between 18 and 25 years old.

While 242 participants (78.8%) reported being aware of anemia as a condition, the results demonstrated an overall lack of precise understanding of its causes, symptoms, prevention, and treatment. Only 13% correctly reported that anemia involves a decrease in red blood cells specifically rather than a combination of platelet and white blood cell deficiency.

There were several encouraging findings, including 83.1% of respondents who knew that a complete blood count (CBC) test diagnosed anemia, and 77.9% of respondents accurately cited low iron as the primary cause for anemia. Additionally, 89.6% correctly believe anemia is a preventable disease, and 86.6% know that iron supplements are the standard treatment.

However, gaps in knowledge have emerged around other key areas. Only 37.1% were aware that parasitic

**ISSN: 2456-3110** **ORIGINAL ARTICLE** June 2024

worms and poor nutrition can contribute to anemia beyond iron deficiency. While 63.5% of respondents could identify some typical anemia symptoms, such as fatigue and poor appetite, only 19.3% specifically recognized fatigue as a cardinal symptom.

Fewer than half (46.91%) understood that a multifaceted approach including diet, exercise, iron and multivitamin supplementation comprises ideal anemia management. Moreover, more than two-thirds (68.4%) of the respondents reported misconception that anemic adolescent girls are feeble.

The details about the different opinions of the participants are mentioned as percentages in Table 1.

**Table 1: Opinion of participants regarding adolescent girls suffering from anemia.**

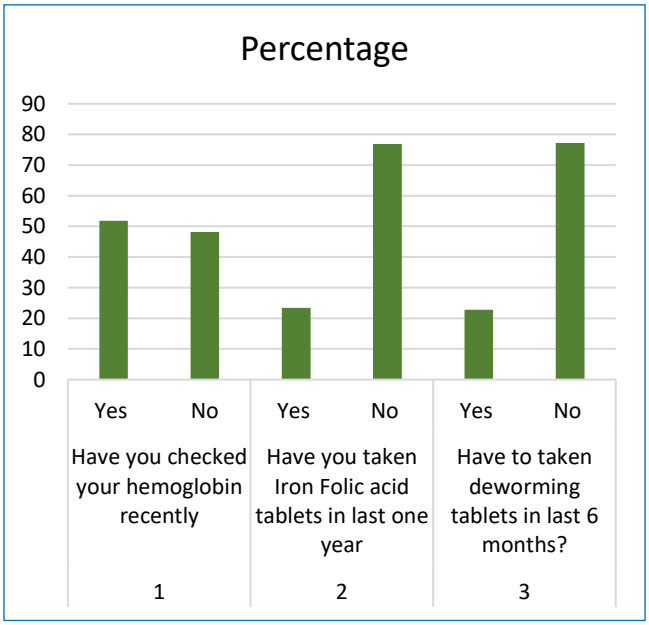
| SN | Variables | Categories | Frequency | Percentage |
|---|---|---|---|---|
| 1. | Do anemic girls have weakness? | Yes | 210 | 68.4 |
| | | No | 81 | 5.2 |
| | | Maybe | 16 | 26.4 |
| 2. | Heavy blood loss causes anemia? | Yes | 241 | 78.5 |
| | | No | 66 | 21.5 |
| 3. | Do anemic girls suffer lack of concentration? | Yes | 263 | 85.7 |
| | | No | 44 | 14.3 |
| 4. | Do anemic girls have pale eyes, tongue, nails? | Yes | 246 | 80.1 |
| | | No | 61 | 19.9 |

The participants were also asked about their personal cleanliness habits, the details of which are presented as frequencies and percentages in Table no. 2.

**Table 2: Personal healthcare habits of the participants**

| SN | Variables | Category | Frequency | Percentage |
|---|---|---|---|---|
| 1. | Do you wash your hands after defecation? | Yes | 296 | 96.4 |
| | | No | 11 | 3.6 |
| 2. | Do you wash your hands with soap before consuming food? | Yes | 293 | 95.4 |
| | | No | 4.6 | 14 |
| 3. | Do you wash fruits before consuming? | Yes | 296 | 96.4 |
| | | No | 11 | 3.6 |
| 4. | Do you trim your nails regularly? | Yes | 273 | 73.78 |
| | | No | 34 | 11.1 |

The questionnaire included a few questions regarding awareness about anemia and its medical treatment. The observations are expressed as in Figure 1.




## DISCUSSION

A total of 94.46% of the population in this survey were under 18-25 years of age. Today's teenagers exhibit increased awareness of anemia compared to previous generations. First, schools, health organizations, and social media platforms have prioritized educating young people on nutrition, iron deficiency, and anemia, ensuring the dissemination of vital information. The current generation exhibits a proactive, health-conscious mindset, eagerly seeking knowledge about medical conditions relevant to their age group. Additionally, ubiquitous access to online health

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resources has empowered teenagers to independently explore and understand the intricacies of anemia.

Within the study population, 242 people were aware of anemia, while 65 people had not even heard about anemia. The high number of people aware of anemia could be due to successful awareness campaigns, educational programmers, or public health initiatives aimed at educating people about anemia and its causes, symptoms, and prevention measures.[8]

Anemia, especially in its severe forms, can have noticeable symptoms and consequences that make it more recognizable as a health issue. Fifteen percent did not recognize anemia as a health issue, whereas 87% recognized it as a health issue.[9] These may include fatigue, weakness, pale skin, shortness of breath, and impaired cognitive function. The impact of anemia on daily life and well-being may make it easier for people to identify anemia as a health concern. A reduction in RBCs is thought to induce anemia in 77.5% of respondents, but a combination of platelets, RBCs, and WBCs is thought to cause anemia in 13% of respondents. While anemia can indeed be caused by a combination of abnormalities in RBCs, platelets, and WBCs (as in certain types of bone marrow disorders or aplastic anemia), this mechanism may be less well known or understood by the general public. The relatively low percentage of respondents (13%) who recognized this combination as a cause of anemia could be due to a lack of knowledge about the role of different blood components in anemia.

According to 83.1% of respondents, a laboratory test called CBC is performed to detect anemia, while 16.9% believe that anemia is diagnosed using different laboratory tests.[10] As anemia is directly related to abnormalities in RBCs and hemoglobin levels, CBC is often the primary test used to screen for and diagnose anemia. This familiarity with the CBC test and its association with anemia could explain why a large proportion of respondents (83.1%) recognized it as the test used to detect anemia. While there are other laboratory tests that can be used to diagnose specific types of anemia or determine the underlying causes, these tests may be less well known or understood by the general public. A total of 16.9% of respondents who believe that anemia is diagnosed using different laboratory tests may have some knowledge of these specialized tests but represent a smaller proportion of the population.

According to 77.9% of respondents, anemia is caused by a lack of iron in the blood, whereas 14% believe that anemia is caused by a decrease in iron, calcium, or potassium.[11]

While deficiencies in other nutrients, such as calcium and potassium, can contribute to certain types of anemia (e.g., calcium deficiency in cases of vitamin D deficiency or potassium deficiency in certain chronic diseases), these associations may be less well known or understood by the general public.

According to 89.6% of people, anemia is a preventable disease. Many educational campaigns and awareness efforts have focused on the preventable nature of anemia, particularly in relation to IDA. By highlighting modifiable risk factors, such as dietary deficiencies, malnutrition, and certain lifestyle factors, these efforts may have contributed to the perception that anemia is a condition that can be prevented.

According to 78.5% of the respondents, regular exercise can prevent anemia, but 21.5% did not believe that anemia could be prevented by regular exercise. A total of 89.6% of people believe that anemia is an illness that can be avoided.[12] Physiologically, the primary function of red blood cells during exercise is to facilitate the transport of oxygen from the lungs to peripheral tissues and the delivery of metabolically produced carbon dioxide to the lungs for expiration; however, when hemoglobin levels are remarkably diminished, oxygenation in the skeletal muscles of extremities is reduced, potentially impairing exercise performance, as severe iron deficiency anemia has been reported to be responsible for a decline in work capacity, particularly in aerobic endurance exercise, and oxygen transport is a potent determinant of the anaerobic threshold for individuals with iron deficiency anemia, thereby establishing anemia as a negative factor impacting physical fitness.[13]

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Iron tablets are the recommended treatment for anemia, according to 86.6% of respondents. Blood transfusions are indicated by 89.6% of respondents in cases of severe anemia that are not treated promptly.[14] Iron is a critical component of hemoglobin, the protein in red blood cells that carries oxygen from the lungs to tissues. It is also required for proper muscle metabolism, neurological development, cellular functioning and synthesis of some hormones. Chronic blood loss from heavy menstruation, parasitic infections, or intestinal disorders can deplete iron stores. Iron controls parasitic infections such as hookworms, which deplete iron stores.[15]

Although 37.1% of respondents stated that anemia can be caused by worms, a poor diet, or a lack of iron in the blood, 55.4% of respondents believed that anemia can only be caused by a lack of iron in the blood.[16] A total of 55.4% of respondents who believe that anemia can only be caused by a lack of iron in the blood may have misconceptions or a lack of comprehensive understanding about the various potential causes and contributing factors of anemia. While factors such as intestinal worm infections, poor dietary intake, and other nutrient deficiencies can contribute to the development of anemia, these associations may be less well known or understood by the general public. The main parasites causing blood loss and leading to direct iron deficiency anemia are common worm infections. These include hookworm infection, whipworm infection and schistosomiasis.[17] Worm infestations are a common underlying cause in low-income countries. Iron deficiency can cause anemia in human intestinal worms.[18]

While irritability, poor appetite, and weariness are all considered typical symptoms of anemia by 63.5% of respondents, only 19.3% of respondents believe that fatigue is a common symptom of anemia.[19],[20] Fatigue is often considered one of the most common and prominent symptoms of anemia, especially iron deficiency anemia. However, the relatively low percentage of respondents (19.3%) recognizing fatigue as a symptom suggests a limited awareness or understanding of this particular manifestation of anemia.

While 53.09% of respondents said that eating a diet high in calcium, exercising, taking iron supplements, and taking multivitamins are all appropriate ways to manage anemia,[21] 35.8% disagreed, believing that an iron supplement is the sole treatment option.[22] While iron supplementation is a crucial part of managing many types of anemia, a comprehensive approach often involves dietary modifications, addressing underlying causes, and supplementing with other nutrients. However, there may be limited awareness or understanding of this holistic management approach among some respondents.

Anemic adolescent girls were considered feeble by 68.4% of the respondents, whereas 26.4% were considered unsure.[23] In certain societies or cultural contexts, there may be ingrained societal expectations or gender norms that associate adolescent girls with fragility or physical limitations, regardless of their health status. These societal biases could influence the perception of anemic adolescent girls as feeble.

Of the population, 78.5% believe that anemia is caused by significant blood loss during menstruation, whereas only 21.5% disagree.[24] Women who bleed heavily during menstruation are at risk of iron deficiency and anemia. This can have a negative effect on the well-being of women. If there is heavy blood loss, iron stores in the body can become low, leading to iron deficiency. If iron deficiency is severe enough to impair red blood cell production, iron deficiency anemia may develop.[25]

A lack of concentration is a problem for anemic females, according to 85.7% of respondents, but not for 14.3% of respondents. Anemia, particularly if severe, can lead to a decrease in oxygen supply to the brain, which can potentially affect cognitive functions, including concentration and attention. Respondents with a better understanding of these physiological mechanisms may be more likely to associate a lack of concentration with anemia in females.[26]

Anemic girls are said to have pale eyes, tongues, and nails by 80.1% of respondents; however, 19.9% disagree.[27] Pallor, or a pale appearance, is a well-known physical sign of anemia, particularly in patients

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with severe iron deficiency anemia. Pale coloration can be observed in the eyes, tongue, and nails due to the reduced levels of hemoglobin and decreased oxygenation of the blood. The high percentage of respondents (80.1%) who recognized these signs suggested a good level of awareness of the visible physical manifestations of anemia.[28]

A total of 96.4% of respondents said they washed their hands after using the restroom; 95.4% said they washed their hands with soap before eating; 95.6% said they washed fruit and vegetables before eating; and 88.3% said they routinely clip their nails, although 11.1% said they did not.[29] Some types of parasitic worms, such as hookworms and whipworms, can cause intestinal bleeding and lead to iron deficiency anemia. Hygiene practices can help prevent the transmission and ingestion of these worms. These hygiene practices reduce the risk of transferring worm eggs or larvae from contaminated surfaces to the mouth.

Of those surveyed, 51.8% had recently checked their hemoglobin level, whereas 48.2% had not. Some people may not be aware of the importance of checking hemoglobin levels regularly, especially if they do not have any symptoms or known risk factors for anemia.[30] It is important to note that regular hemoglobin level checks can help detect anemia early and allow timely treatment and management of the underlying cause.[31]

In the last year, 76.9% of respondents said they had not taken iron folic acid tablets, while 23.1% said they had. Many people may not be aware of the importance of iron and folic acid supplementation, especially if they do not have any obvious symptoms or known risk factors for deficiency, or individuals may not consider taking these supplements on their own in the absence of medical advice from a healthcare provider.

Deworming tablets, which typically contain anthelmintic drugs such as albendazole, mebendazole, or pyrantel pamoate, are effective at eliminating these parasitic worms from the body.[32] While 22.8% of respondents had taken tablets, 77.2% of respondents had not taken any deworming medication in the previous six months. Regular deworming, especially in areas with a high prevalence of parasitic worm infections, is an important strategy for preventing and treating anemia, particularly in vulnerable populations such as children, pregnant women, and individuals with compromised immune systems.

### Limitations and scope for further study

While the survey provides valuable insights into anemia awareness and perceptions, it has certain limitations that should be considered. First, the sample population predominantly consisted of young adults aged 18-25 years, limiting the generalizability of the findings to other age groups. By focusing only on an urban population, the study may not accurately capture the awareness levels and understanding of anemia in rural communities, which could differ significantly due to factors like access to education, healthcare resources, and exposure to awareness campaigns. The survey relies on self-reported data, which may be subject to biases and inaccuracies. The cross-sectional nature of the survey also prevents the establishment of causal relationships between variables. Finally, the survey does not capture qualitative aspects of respondents' attitudes and beliefs about anemia, which could provide additional insights.

### Interpretation

The study revealed generally good awareness that anemia is an iron deficiency disorder among the predominantly young adult population surveyed. However, gaps in the understanding of other contributing factors, certain symptoms, and comprehensive management approaches beyond iron supplementation have been identified. Societal biases influenced the perceptions of anemic adolescent girls. The study highlighted the need for increased awareness and access to preventive measures such as regular hemoglobin monitoring and deworming practices within this demographic. Targeted educational efforts could address these gaps and promote a more holistic understanding of anemia's causes, manifestations, and management strategies.

### Generalizability

The generalizability of this anemia survey is limited due to the narrow demographics of the sample population.

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With 94.46% of respondents being young adults aged 18-25 years, the findings may not apply to other age groups. Furthermore, the unspecified geographic region and lack of socioeconomic and cultural information about the respondents restrict the applicability of the results to different contexts. Without details on sampling methods and representativeness, generalizing the findings to broader populations is problematic. While insightful for the studied group, caution is advised when extrapolating these results beyond the specific population surveyed.

## CONCLUSION

The survey showed high anemia awareness among young adults surveyed. Most recognized anemia as low iron/red blood cells and identified iron supplements as treatment. They understood diet/hygiene's role in prevention. However, gaps existed regarding other contributing factors like worms, heavy periods, dietary deficiencies beyond iron. Fatigue/lack of concentration were not widely linked to anemia. Some had limited awareness of comprehensive management beyond just iron. Regular hemoglobin checks and deworming were not widely practiced, highlighting need for increased awareness about deworming and regular checkup. Overall, while anemia awareness was relatively high, targeted educational efforts could further enhance our understanding of its multifactorial causes, symptoms, and holistic management strategies within this population.

**Acknowledgments:** I would like to thank all the participants who took the time to complete this survey. Their insights and responses were invaluable for this research study. We acknowledge the support of our institute and ACS college for allowing us to conduct the work. We also acknowledge Dr. Rupmanjari Guruprasad Shanbhag, Dr. Vatsal Dhudashiya, Dr. Kalpesh Dhakdiya for their assistance in the article.

## REFERENCES

1. Anemia: Symptoms, Causes & Treatment [Internet]. [cited 2024 May 9]. Available from: https://my.clevelandclinic.org/health/diseases/3929-anemia
2. Gadó K, Khodier M, Virág A, Domján G, Dörnyei G. Anemia of geriatric patients. Physiol Int [Internet]. 2022 Jun 30 [cited 2024 May 2];109(2):119–34. Available from: https://www.mayoclinic.org/diseases-conditions/anemia/symptoms-causes/syc-20351360
3. Press Information Bureau [Internet]. [cited 2024 May 6]. Available from: https://pib.gov.in/PressReleasePage.aspx?PRID=1795421
4. (PDF) Awareness of Anemia Causes Among Saudi Population In Qassim Region, Saudi Arabia [Internet]. [cited 2024 May 9]. Available from: https://www.researchgate.net/publication/260230608_Awareness_Of_Anemia_Causes_Among_Saudi_Population_In_Qassim_Region_Saudi_Arabia
5. Let S, Tiwari S, Singh A, Chakrabarty M. Prevalence and determinants of anemia among women of reproductive age in Aspirational Districts of India: an analysis of NFHS 4 and NFHS 5 data. BMC Public Health [Internet]. 2024 Dec 1 [cited 2024 May 9];24(1):1–19. Available from: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-024-17789-3
6. Gillespie B, Katageri G, Salam S, Ramadurg U, Patil S, Mhetri J, et al. Attention for and awareness of anemia in adolescents in Karnataka, India: A qualitative study. PLoS One [Internet]. 2023 Apr 1 [cited 2024 May 9];18(4). Available from:/pmc/articles/PMC10075435/
7. Pareek P. A Study on Anemia Related Knowledge Among Adolescent Girls. International Journal of Nutrition and Food Sciences. 2015;4(3):273.
8. Gillespie B, Katageri G, Salam S, Ramadurg U, Patil S, Mhetri J, et al. Attention for and awareness of anemia in adolescents in Karnataka, India: A qualitative study. PLoS One [Internet]. 2023 Apr 1 [cited 2024 Apr 25];18(4). Available from:/pmc/articles/PMC10075435/
9. Mujeeb. Technical Handbook on Anemia in Adolescents WEEKLY IRON AND FOLIC ACID SUPPLEMENTATION PROGRAMME.
10. Freeman AM, Rai M, Morando DW. Anemia Screening. StatPearls [Internet]. 2023 Jul 25 [cited 2024 Apr 29]; Available from: https://www.ncbi.nlm.nih.gov/books/NBK499905/
11. Gadó K, Khodier M, Virág A, Domján G, Dörnyei G. Anemia of geriatric patients. Physiol Int [Internet]. 2022

Jun 30 [cited 2024 Apr 29];109(2):119–34. Available from: https://www.mayoclinic.org/diseases-conditions/anemia/symptoms-causes/syc-20351360

12. Avoiding Anemia | NIH News in Health [Internet]. [cited 2024 Apr 29]. Available from: https://newsinhealth.nih.gov/2014/01/avoiding-anemia
13. Tsai KZ, Lai SW, Hsieh CJ, Lin CS, Lin YP, Tsai SC, et al. Association between mild anemia and physical fitness in a military male cohort: The CHIEF study. Sci Rep [Internet]. 2019 Aug 1 [cited 2024 May 2];9(1):11165. Available from:/pmc/articles/PMC6671998/
14. Anemia - Treatment and Management | NHLBI, NIH [Internet]. [cited 2024 Apr 29]. Available from: https://www.nhlbi.nih.gov/health/anemia/treatment
15. Alleyne M, Horne MK, Miller JL. Individualized treatment for iron deficiency anemia in adults. Am J Med [Internet]. 2008 Nov [cited 2024 May 2];121(11):943. Available from:/pmc/articles/PMC2582401/
16. Maciej Serda, Becker FG, Cleary M, Team RM, Holtermann H, The D, et al. Synteza i aktywność biologiczna nowych analogów tiosemikarbazonowych chelatorów żelaza. G. Balint, Antala B, Carty C, Mabieme JMA, Amar IB, Kaplanova A, editors. Uniwersytet śląski [Internet]. 2013 [cited 2024 Apr 29];7(1):343–54. Available from: https://www.pennmedicine.org/for-patients-and-visitors/patient-information/conditions-treated-a-to-z/anemia
17. Farid Z, Patwardhan VN, Darby WJ. Parasitism and Anemia. Am J Clin Nutr. 1969 Apr 1;22(4):498–503.
18. Shah SS, Shah R, Basnet R, Patel D, Bhattarai U, Shah B, et al. Worm infestation as a cause of severe anemia in a frail older adult: a case report. Annals of Medicine and Surgery [Internet]. 2023 Oct [cited 2024 May 2];85(10):5149. Available from:/pmc/articles/PMC10553005/
19. Anemia: Causes, Symptoms, Diagnosis, Treatments [Internet]. [cited 2024 Apr 30]. Available from: https://www.webmd.com/a-to-z-guides/understanding-anemia-basics
20. Weckmann G, Kiel S, Chenot JF, Angelow A. Association of Anemia with Clinical Symptoms Commonly Attributed to Anemia—Analysis of Two Population-Based Cohorts. J Clin Med [Internet]. 2023 Feb 1 [cited 2024 Apr 30];12(3):921. Available from:/pmc/articles/PMC9918126/
21. Diet plan for anemia: Best meals and foods for boosting iron [Internet]. [cited 2024 May 4]. Available from: https://www.medicalnewstoday.com/articles/322336
22. Heath ALM, Skeaff CM, O'Brien SM, Gibson RS, Williams SM. Can dietary treatment of nonanemic iron deficiency improve iron status? J Am Coll Nutr [Internet]. 2001 Oct 1 [cited 2024 Apr 30];20(5):477–84. Available from: https://pubmed.ncbi.nlm.nih.gov/11601562/
23. Gadó K, Khodier M, Virág A, Domján G, Dörnyei G. Anemia of geriatric patients. Physiol Int [Internet]. 2022 Jun 30 [cited 2024 Apr 30];109(2):119–34. Available from: https://www.mayoclinic.org/diseases-conditions/anemia/symptoms-causes/syc-20351360
24. Nelson AL, Ritchie JJ. Severe anemia from heavy menstrual bleeding requires heightened attention. Am J Obstet Gynecol [Internet]. 2015 Jul 1 [cited 2024 Apr 30];213(1):97.e1-97.e6. Available from: https://pubmed.ncbi.nlm.nih.gov/25935784/
25. Mansour D, Hofmann A, Gemzell-Danielsson K. A Review of Clinical Guidelines on the Management of Iron Deficiency and Iron-Deficiency Anemia in Women with Heavy Menstrual Bleeding. Adv Ther [Internet]. 2021 Jan 1 [cited 2024 May 6];38(1):201. Available from:/pmc/articles/PMC7695235/
26. Gattas BS, Ibetoh CN, Stratulat E, Liu F, Wuni GY, Bahuva R, et al. The Impact of Low Hemoglobin Levels on Cognitive Brain Functions. Cureus [Internet]. 2020 Nov 8 [cited 2024 May 6];12(11). Available from:/pmc/articles/PMC7723430/
27. 5 signs of iron deficiency in your skin, hair and nails | Health - Hindustan Times [Internet]. [cited 2024 Apr 30]. Available from: https://www.hindustantimes.com/lifestyle/health/5-signs-of-iron-deficiency-in-your-skin-hair-and-nails-101669276369349.html
28. Pallor (Paleness): Causes, Diagnosis & Treatment [Internet]. [cited 2024 May 6]. Available from: https://my.clevelandclinic.org/health/diseases/pallor
29. Coffey D, Geruso M, Spears D. Sanitation, Disease Externalities and Anemia: Evidence From Nepal. Econ J (London) [Internet]. 2018 Jun 1 [cited 2024 Apr 30];128(611):1395. Available from:/pmc/articles/PMC6001781/

**ISSN: 2456-3110** **ORIGINAL ARTICLE** June 2024

30. Freeman AM, Rai M, Morando DW. Anemia Screening. StatPearls [Internet]. 2023 Jul 25 [cited 2024 May 7]; Available from: https://www.ncbi.nlm.nih.gov/books/NBK499905/

31. THE IMPORTANCE OF HEMOGLOBIN SCREENING AND ITS IMPACT ON ANEMIA PATIENTS | Isotekindo [Internet]. [cited 2024 May 7]. Available from: https://www.isotekindo.co.id/article/details/222

32. Starkey LA, Blagburn BL. Antiparasitic Drugs. Greene's Infectious Diseases of the Dog and Cat, Fifth Edition [Internet]. 2023 May 29 [cited 2024 May 7];149–60. Available from: https://www.ncbi.nlm.nih.gov/books/NBK544251/

**How to cite this article:** Shweta Gupta, Joshi Mrudula Vinayak, Shipra Agrahari, Joshi Vinayak Nilkanth. Knowledge and awareness related to Anemia and its treatment; among the Non-Medico Population in the PCMC Region: A Cross-Sectional Survey Study. J Ayurveda Integr Med Sci 2024;6:37-45. http://dx.doi.org/10.21760/jaims.9.6.1

**Source of Support:** Nil, **Conflict of Interest:** None declared.

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