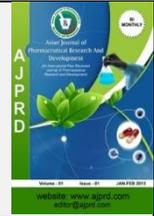


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Review Article

Integrative Review on Nutritional Dynamite for Anaemia of Adolescent Girls

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ABSTRACT

Moringa Oleifera is a Miracle tree, native to India. This golden tree has high nutritional value in its each and every part. This locally available, economical, self growing tree has immense potential to control Iron Deficiency Anaemia. According to the "The Comprehensive National Nutrition Survey, Thematic Reports- 2019" states that investing in the nutrition of the 1.2 billion adolescents, will shape the world's future. Ensuring Indian adolescents are nourished and growing well is critical to achieving India's demographic dividend. Moringa is perhaps plant based, iron rich inexpensive food. Iron is notoriously difficult for the body to absorb, so it is necessary to eat foods that also include vitamins that will help our body to retain iron. If we try to prevent or drastically increase the iron level among adolescents adding Moringa to the diet can help to bring out the massive and enormous change.

KEY WORDS: Anaemia, Adolescent Girls, Drumstick leaves, Moringa Olifera, Malnutrition, Iron Deficiency Anaemia.

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INTRODUCTION

Adolescence is the transition period from childhood to adult hood in which drastic changes occurs in the body and in the mind. In today's era adolescent girls are facing many health problems: in that anemia is the most prominent one due their life style modifications like eating junk food, snacking, skipping meals, etc. One in five is an adolescent, in which anaemic girls become the next generation of anaemic mothers, thus perpetuating this vicious cycle of malnutrition. Drum stick leaves are in our door steps contains all micro and macro nutrients which bring magic in the adolescent health status. It's the weapon as nutritional dynamite to resolve the war of anaemia in our Indian adolescent girls. So there is a tremendous need to be appropriately intervened with low cost strategy to combat iron deficiency and other nutritional deficiencies. So un-doubtfully drumstick leaves are the best low cost modality to save our future mothers.

Little Leaves: Lengthy Healthy Life





Moringa oleifera- Drumstick tree

Moringa oleifera, native to India, grows in the tropical and subtropical regions of the world. It is commonly known as 'drumstick tree' or 'horseradish tree'. Moringa can withstand both severe drought and mild frost conditions and hence widely cultivated across the world. With its high nutritive values, every part of the tree is suitable for either nutritional or commercial purposes. Moringa oleifera belonging to the family of Moringaceae is an effective remedy for malnutrition. Moringa is rich in nutrition owing to the presence of a variety of essential phyto-chemicals present in its leaves, pods and seeds. In fact, moringa is said to provide 7 times more vitamin C than oranges, 10 times more vitamin A than carrots, 17 times more calcium than milk, 9 times more protein than yoghurt, 15 times more potassium than bananas and 25 times more iron than spinach¹. The fact that moringa is easily cultivable, makes it a sustainable remedy for malnutrition. It is used as potential antioxidant, anticancer, anti-inflammatory, anti-diabetic and antimicrobial agent.

Anaemia among Adolescence

“Healthy adolescent girls of today are the healthy mothers of tomorrow”

Adolescence is a phase of rapid growth and development during which physical, physiological and behavioral changes occur. They constitute more than 1.2 billion (or) 1 in 6 of the world's population worldwide, and about 21% of Indian population. Comprehensive National Nutritional survey 2016-17 stated that poor nutrition leading to the iron deficiency is the underlying factor for more than 60% of all anemias. India contributes almost one quarter to the global burden of anemia. More than 1.1 million adolescents aged 10-19 years died in 2016, over 3000 die every day, mostly from preventable or treatable causes. Iron deficiency anemia was the second leading cause of years lost by adolescents to death and disability in 2016. Nutrition is a critical part of health and development. Better nutrition is related to improved infant, child and maternal health, stronger immune systems, safer pregnancy and childbirth, lower risk of non-communicable diseases and longevity. WHO Global Nutrition Targets 2025 report estimated that approximately 24.8 % world's population are affected with an Anemia and 50% of an anemic case is due to iron deficiency. The prevalence of anemia was

highest in south Asia and central and west Africa. While the causes of anemia are variable, it is estimated that half of cases are due to iron deficiency. The Comprehensive National Nutrition Survey, Thematic Reports- 2019 stated that investing in the nutrition of the 1.2 billion adolescents (10-19 years aged population) will shape the world's future.

India is home to more than 243 million adolescents, who account for almost 20 percent of the country's population. In addition, over half of girls aged 15–19 (56 percent) are anemic. In India, anemia is a severe health problem because more than 74.3% population is affected with anemia. The overall prevalence of anemia among adolescent girls in India is 54% (National Family Health Survey 2015-16). The Comprehensive National Nutrition Survey, Thematic Reports- 2019 stated that one fifth of the world's adolescent population-253 million live in India. In that Anemia affects 40% adolescent girls: 32% girls in 10-14 years and 48% in girls 15-19 years.

Little Leaves of to combat Anaemia

Leaves of drumstick could serve as a valuable source of nutrient for all age groups and known as nutrition dynamite. The leaves are known as great source of vitamins and minerals being served raw, cooked or dried. United States Department of Agriculture reported that each 100gm of drumstick leaves contains 375kcal energy, 25g protein, 50g Carbohydrate, 2000mg calcium and 4.50mg Iron. By consumption of Drumstick leaves, iron can be increased. This is because of the protein content of Moringa leaves which are three times higher than milk powder. The drumstick leaves is a low cost, locally available food material which is effective to combat the highly prevalent problem of anemia in adolescent girls and also useful to the economically weaker section of the society. Moringa oleifera leaves will satisfy a child with 14% of the protein, 40% of the calcium, 23% of iron and nearly all the vitamin A that a child needs in a day. Every 100gm portion of leaves could provide women with over a third of her daily need of calcium and give her important quantities of iron, protein, copper and sulphur and B-vitamins.

Raimunda Samia Nogueira, Brilhante Jamille Alencar Sales et al (2017)⁵ stated in the article “Research advances on the multiple uses of Moringa oleifera: A sustainable alternative for socially neglected population” that M. oleifera is an inexpensive, eco-friendly and socially beneficial alternative for anaemia, especially for the socially neglected population, suffering from poverty and malnutrition and for those who have limited access to technological resources.

Priyal D Roy, Siddaram Shivaji Sarate (2020)⁶ conducted a Quasi experimental study in the selected schools in Gujarat among 64 adolescent girls in the age group of 13-19 years by following randomized sampling method. Intervention was provided for 21 days (100 ml drumsticks leaves juice daily) to the experimental group. Paired t test suggested that there was a significant change in haemoglobin level of experimental group,

obtained t value 4.464 was more than table value ($t = 2.042$) with p value 0.000099 at 0.05 level of significance. χ^2 test was done to find out the association between Pre test Hb level with demographic variables that revealed that there was an association between pre test Hb level with diet, religion and number of siblings. Obtained Chi-square value were, for Number of sibling, ($\chi^2 = 6.78$) Religion, ($\chi^2 = 10.26$), diet ($\chi^2 = 6.14$) at 0.05 level of significance.

Manisha Choudhary, SP Singh, Chanchala Rani Patel (2020)⁷ conducted a pre experimental study on Effect of drumstick leaves supplementation for treating iron deficiency anemia in adolescence girls by one group pre test - post test design among the 20 anemic adolescence girls between 13-15 years with their hemoglobin levels between 9-10gm/dl in the adopted village Loing, block-Raigarh (C.G.) Socio economical survey and anthropometric assessment, body mass index and diet survey were done and the intervention with dried drum stick leaves powder. Intervention was started with 25gm of dry drumstick leaves powder supplementation once a day for three months. After three months, the hematological levels were analyzed and recorded. The result revealed that significant improvement in average Hb level from 9.6.mg/ dl before intervention to 11.mg/dl after intervention. This study showed that the hemoglobin levels of the adolescence significantly improved in post intervention with drumstick leaves powder. This may be promoted in the community as a dietary supplementation in anemic girls.

Mrs. R. Deepa et al (2020)⁹ conducted a study to assess the effectiveness of drumstick leaves soup on haemoglobin among 24 adolescent girls in the age group of 17-19 years at selected colleges in Coimbatore. Hb checked before and after consumption of drumstick leaves soup. Drumstick leaves soup is prepared by boiling 1 kg of drumstick leaves with 4 litres of water for 30 minutes added with 2 drops of lemon juice for each 100 ml and stained well and administered 100 ml per day for 14 consecutive days. The mean score was 0.6875, with the SD 1.449 and the Standard error was 0.295, the calculated 't' value 2.331 was higher than the table value 2.06 at 0.05 level of significance. Hence there is a significant difference in the level of haemoglobin before and after the administration of drumstick leaves soup among adolescent girls with anaemia

Chrysholite Jenisha C and Rajitha SR (2018)¹⁰ conducted a Pre experimental study to assess the effectiveness of drumstick leaves soup on haemoglobin level among 30 antenatal mothers with one group pretest - posttest design in selected rural areas at Kanyakumari District. Assessment was done for Demographic Variables, Clinical Variables and Haemoglobin Estimation. Intervention was given with the drumstick leaves soup about 200 ml for 4 weeks daily. Among the subjects, 60% had moderate anaemia and 40% had mild anaemia in the Pre test. At post-test, 53.33% had mild anaemia, 40% had normal haemoglobin level and 6.67% had moderate anaemia. The study revealed that, the pre-

test mean score of haemoglobin level was 10.17 ± 1.04 and post-test was 12.12 ± 1.09 . The obtained 't' value was 13.54 was very higher than the table value. Hence, it was highly significant at < 0.05 level. Hence, the drumstick leaves soup administration can be incorporated as an effective method on improvement of haemoglobin level among antenatal mothers. This may be promoted in the community as a prophylactic and a dietary supplementation in anaemic women.

Jeevitha A and Sujatha R (2017)⁸ conducted a Pre experimental study by following One group pre-test post-test design on Effectiveness of moringa leaves extract on hemoglobin level among rural adolescent girls with anemia in selected schools at Mangalore. Pre and Post test Hemoglobin was estimated by sahli's hemometer among 98 adolescent girls and 70 had mild anemia out of which 51 numbers of students were selected as subjects on the basis of inclusion criteria. Intervention was given with Moringa leaves extract which was commercially available was administered with the Iron content in 3 gms is 0.99mg for 21 days (3 gms of Moringa leaves extract mixed with 15 ml of mineral water). This study showed that the mean pretest hemoglobin level of the adolescent girls (10.82) is less than the post test hemoglobin level (12.26). The "t" calculated value 13.5 is higher than the table value and the p value < 0.05 . So there is difference in mean pre-test hemoglobin level and mean post- test hemoglobin level at 5% level of significance. Therefore the administration of moringa extract is effective in improving the hemoglobin level among the adolescent girls

Bharathi, L. and Sindhu S (2015)¹¹ conducted an experimental study to evaluate the efficacy of Moringa oleifera leaf Protein Concentrate - MLPC among adolescent girls. The result revealed that experimental group who received the MLPC capsules has showed significant raise in haemoglobin level. Therefore, MLCP recommended for the improvement in the health status of moderate anaemic adolescent girls. The findings of the study revealed that Moringa oleifera which is available at our door steps is a suitable food to improve haemoglobin status of adolescent girls who have the responsibility to produce healthy offspring in their adulthood and can make the country healthy and wealthy.

T.Chandra et al (2015)¹² conducted a Pre experimental study to assess the effectiveness of drumstick leaves poriyal to treat anaemia among the woman in the age group of 15-45 years those who belong to the lower socio-economic status in rural area Pichavaram by adopting One group pre-test and post-test design. As an intervention, 100gm of cooked drumstick leaves poriyal was given on alternate days for three months. After three months the haematological levels were analyzed and recorded. At the end of the supplementation period (90 days), the subjects showed a significant improvement in Hb level at $P < 0.001$. This study revealed that drumstick leaves poriyal had significantly improved the mean haemoglobin levels with other haematological indices in

the post test significantly. This study concluded that this simple and low cost technology can be promoted in the community to prevent the occurrence of iron deficiency anaemia

Vanisha S Nambiar, Shilpa Parnami, Parul Guin (2010)¹³ stated that Anaemia begins in childhood, worsens during adolescence and gets aggravated during pregnancy. In India, adolescent girls, who constitute a sizable segment of its population form a vulnerable group and are at a greater risk of morbidity and mortality. It is the shaping period of life when maximum amount of physical, psychological and behavioural changes take place. This is a vulnerable period in the human life cycle for the development of nutritional anaemia. Adolescent girls are particularly prone to iron deficiency anaemia because of increased demand of iron for haemoglobin, myoglobin and to make up the loss of iron due to menstruation and poor dietary habits.

CONCLUSION

In spite of all the meticulous intervention directed to prevent anemia, still the adolescent girls are more prone to get anemia due to their faulty food habits, discrimination, negligence and other physiological factors. So there is a colossal need to reduce the level of anemia among the future mothers of the nation by low cost, locally available and acceptable strategy in which Drum stick leaves supplementation is the best method to prevent anemia. It's a high time to motivate the young girls to consume drumstick leaves which are available in their door steps.

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