COMPARATIVE STUDY ON EFFECT OF GARDEN CRESS SEEDS HELTH DRINK AND "MIKRONUTRIENT SUPPLEMENTATION" ON MNC SCHOOL CHILDREN IN ANEMIA

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1.Introduction

Micronutrient deficiencies take a major role on the health and wellbeing of our population. Among the several essential micronutrients deficiency that have severe damaging effects on physical, cognitive, socio-economic performance, anemia particularly due to iron deficiency ranks the most prevalent.

Anaemia is a condition characterized by reduction in the volume of red blood cells and a decrease in the blood concentration of haemoglobin in the blood. A reduction in the volume of red blood cells in the blood decreases the amount of oxygen reaching the tissues and organs of the body, causing a range of adverse symptoms. An anaemic person often appears pale and weak and may feel breathless or faint. He/she may aware of a pounding heart. An anaemic person may have insomnia, decreased appetite, or a general feeling of malaise. In developing countries, nearly half of all women and children are anaemic, with the highest overall rates being reported in Southern and Central Asia and certain regions of Africa. Causes of anaemia include inadequate intake of iron, folate, vitamin B12 or other nutrients.

Anaemia is one of the major public-health problem that affects the world's total population widely (Dutta.DC,2004). Anaemia is known to affect people belonging to all age-groups, particularly women of child bearing age and children. World Health Organization (WHO) definitions for anaemia is as follows: in children's from 6 months to 5 year, anaemia is defined as a Hb level <11g/dl, and in children between 5–11 years Hb < 11.5 g/dl (WHO,2011]). India's experience with decades of iron supplementation programmes has been less than satisfactory. The challenge, therefore, is to increase the intake, bioavailability and absorption of iron in the system (Gopalan, 2014). It is high time to prevent and control anaemia through supplementation coupled with nutrition education.

Nidhi Agarwal and Sheel Sharma (2013) stated that Garden cress seeds are rich source of protein, fat, iron, calcium and phosphorous. It is an important source of iron, folic acid, calcium, vitamins C, E and A. It is a rich source of iron 'containing 100 mg iron/100g garden cress seeds.Vitamin C greatly increases iron absorption. (Gupta, Chhavi and Singhal, Surbhi,2011).

Snehal Doke and Manisha Guha(2014) found that Lepidium sativum, commonly known as garden cress is a fast growing annual herb that is native to Egypt and West Asia.

For women's health: Emenagogue, **Galactogogue**, **Aphrodisiac**, For the gastro intestinal tract, For the respiratory tract, For anaemia,For diabetes, For cancer and For various other things.

Hurrell R and Egli (2010) stated that enhancer of non heme iron is ascorbic acid and muscle tissue which may reduce ferric iron to ferrous iron and bind it in soluble complexes which are available for absorption.)

Hence these reviews may inspire the researchers for further investigation for the application of garden cress seeds as nutritional food as well as therapeutic agent

2.METHODOLOGY:

The study was conducted on school going children group of 40 respondents (8-11 yrs), selected from Municipal corporation school named Nutan middle school, Aurangabad. School permission

was obtained. Total 60 children were interviewed. Out of which 40 were selected. Random sampling was used to select the sample.
Total 40 respondents were divided into 2 groups:
– 20 children in experimental group
– 20 children in placebo group.

(Experimental group: This group will contain children to which health rich drink will be given.
Placebo group: This group will have children who will receive the Mikronutrient supplementation given by the school.)

Tools of data collection:
For the present study, survey method was used for data collection, in which a self prepared questionnaire was given to respondents, containing the detailed information about their name, age, sex, health status, percentage of hemoglobin, clinical finding etc.


Lemon juice


Garden cress seeds


Sugar

<u>Recipe/ Preparation Of Health Drink</u>
Ingredient:
Amount for 1 cup
Table: Ingredient and amount of Health drink

Garden cress seed	5g (aprox.)
Sugar	5g(aprox)
Lime juice	5g (aprox.)
Water	100ml


Devloped drink

Placebo Group:
Placebo group was given their regular Mikronutreint liquid supplementation in school given by government of Maharashtra under MDM scheme 1 tea spoon two times a week.

Plate : Mikronutrient supplement syrup

Table : Nutritive value of the product as per 15 gm of Mikronutrient liquid:

Vitamin A	Niacinamide	Vitamin D3	Elemental iron	Folic acid	Calcium gluconate	Malt extract
4500IU	45mg	600IU	20mg	1.5mg	360mg	4.52gm

Hematologic Assessments: Sahli's method was used for hematologic assessment.

Anthropometric Assessment:
Anthropometry involves obtaining physical measurements of an individual and relating them to standards that reflect the growth and development of the individual.

- **Height,**
- **Weight:**

Medical History:
To find out any diseased condition or to know any food allergy or use of any food supplementation medical history was asked to children. Following history was taken. Any food supplementation, Any medication, Any food allergy, Goiter / Thyroid complaint, G.I complaint, Any respiratory complaint, Any other complaint.

Clinical Findings:
Various clinical finding were observed for the feeding purpose. As anemia, if it is present, have its sign and symptoms. And it may reveal many other diseased conditions too. So following clinical findings were observed. Pallor, Nails, Skin, Hairs, PEM.

Nutritional Education Programme:
Nutritional education program was conducted for children of school in which importance of good nutrition and hazards of junk food along with personal hygiene was explained. Animated poems showing importance and effects of milk, green and other vegetables were presented.

Statistical Analysis:
Different data were analysis with the help of suitable statistical method the mean and standard deviation were calculated to find out the prevalence of iron deficiency anemia. T test

was calculated to find out difference between ICMR values to compare the effect of garden cress seeds and Mikronutrient supplementation in children.

SCHEMATIC REPRESENTATION

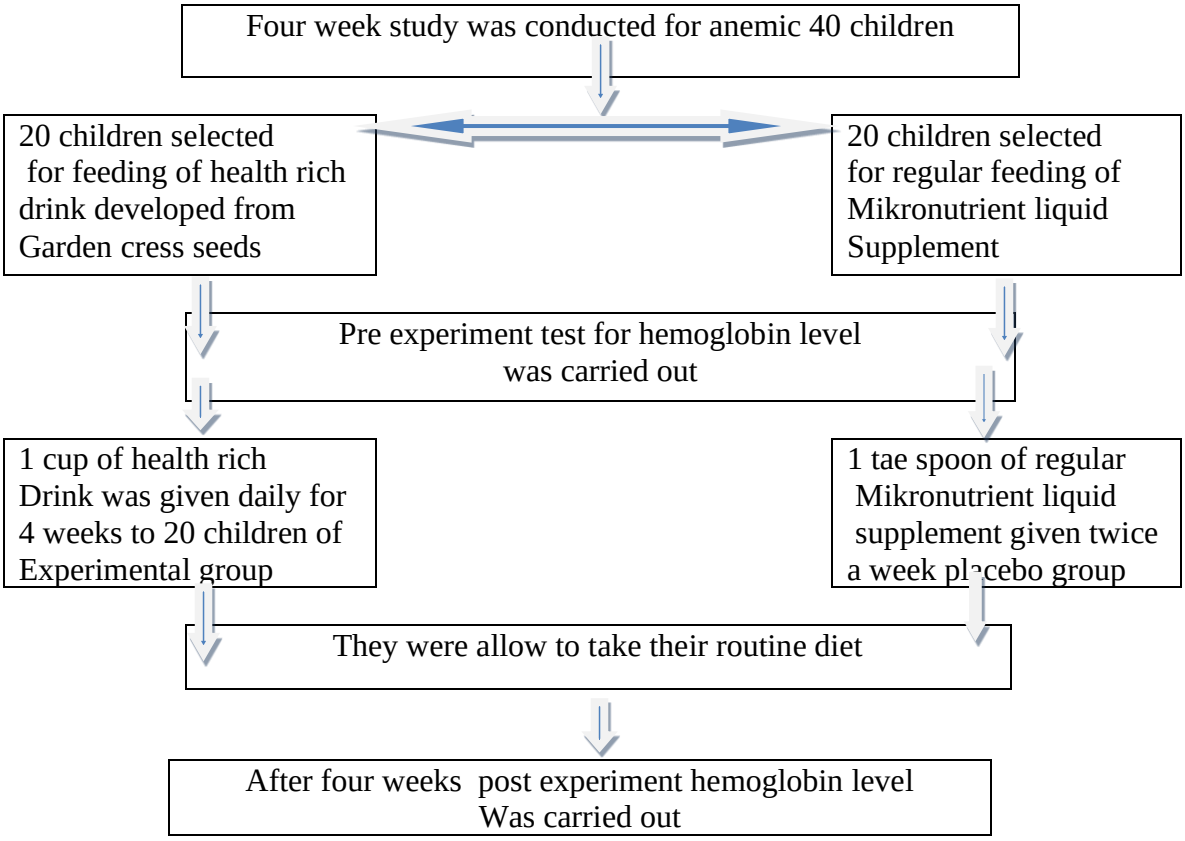

FIG : PROTOCOL OF THE PRESENT STUDY

3. RESULT AND DISCUSSION:

Table: Nutritive value of the product as per 100 ml

Energy	Protein	Carbohydrate	Fat	Iron	Calcium	Phosphorus
45.45kcal	1.32g	6.905g	1.27g	5.020mg	22.95mg	36.7mg

Prevalence of anemia:

To find prevalence in Nutan middle school 61 students were examined.

Prevalence of anemia in males

30 males were assessed for anthropometric and hemoglobin and following data were obtained.

Table : Prevalence of anemia in males

MALE			
Anthropometric	Male subject (n= 30) Mean±SD	ICMR/WHO Mean±SD	t- test

Height	122.75±12.27	137.37±6.39	2.325
Weight	24.86±5.32	29.525±3.811	1.645
Biochemical			
Hemoglobin	9.62±1.50	12±0.5	3.121

That is the male subjects of MCN's Nutan middle School are having less than normal height and hemoglobin. Pasricha SR et al, (2010) emphasized on the high prevalence of anaemia among all the age groups of children.

Nimmathota Arlappa et al,(2014) stated the Prevalence of anaemia among different physiological groups in the rural areas of Maharashtra observed that The overall prevalence of anaemia was 59% among pre-school children. The male subjects of MCN's Nutan middle School are having mostly near normal weight.

Prevalence of anemia in females

31 females were assessed for the anthropometric and hemoglobin and following values were obtained

Table : Prevalence of anemia in females

FEMALE			
Anthropometric	Female subject n=31 Mean±SD	ICMR/WHO Mean±SD	t-test
Height	121.04±8.75	137.3±6.76	6.713
Weight	24.93±6.17	29.65±4.27	2.779
Biochemical			
Hemoglobin	9.45±1.79	12±0.5	5.278

Priyanka Wankhade et al (2011) studied on female adolescents and adults are among the population groups who are most affected by iron deficiency. The overall anemia prevalence in this group was 13.6%. Anemia prevalence was higher in girls than boys (15.3%,) and Kalaivani (2009) also found that the prevalence of anemia in India is among the highest in the world. Prevalence of anemia is higher among pregnant women and preschool children.

Similarly the present study also found that the female subjects of MCN's Nutan middle School are having less than normal height, weight and hemoglobin.

Effect on hemoglobin level

20 Experimental subjects were feed with garden cress seeds health drink and their pre experimental and post experimental values of anthropometric and hemoglobin data were compared. 20 subjects of placebo group were given their regular supplementation of Mikronutrient syrup and before and after feeding experiment their anthropometric and hemoglobin values were compared. Post experimental hemoglobin value of placebo and experimental group is compared here.

Table : Effect on Hemoglobin level

	Experimental Male(n=8) mean±sd	Placebo Male(n=9) mean±sd	Experimental Female(n=12) mean±sd	Placebo Female(n=11) mean±sd
Hb Value	12.18±1.47	10.71±1.48	12.85±1.32	10.37±1.63
t-value	1.515=2.731		2.272=2.080	

That mean it can be said that health drink developed with ga

4.CONCLUSION:

Health drink which is developed with garden cress seeds, sugar, lemon juice and water. Different data were analysis with the help of suitable statistical method the mean and standard deviation were calculated to find out the prevalence of iron deficiency anemia. T test was calculated to find out difference between ICMR values to compare the effect of garden cress seeds and Mikronutrient supplementation in children. Prevalence of anthropometric measurement, hemoglobin level, medical history, clinical finding was carried out by survey method in N.M. School. Thirty males and thirty-one females' forms were filled; mean and standard deviation were calculated. But there was significant difference in the level of hemoglobin in placebo group also. So hemoglobin level of experimental group was compared with placebo group And post experimental values were found more than pre experimental value. There was significant increase in hemoglobin level. The pre experimental values of height, weight and hemoglobin levels of 11 female subjects of placebo group And garden cress seed health drink was found more effective in increasing hemoglobin than Mikronutrient supplementation of school.

5. REFERENCES:

1.Dutta DC. Anaemia in pregnancy. Text book of Obstetrics including Perinatology & Contraception, 6th edition ISBN:81-7381-142-3; 2004. Published by New Central Book Agency (P) Ltd, Calcutta, India; 262-267.

2.World Health Organization. Vitamin and Mineral Nutritional anaemia. Geneva: WHO, 2011

3.Gopalan.C, Rama Sastri B.V. and Balasubramanian**, S.C., (2010),** Nutritive Value of Indian Foods, National Institute of Nutrition, ICMR, Hyderabad.

4. Nidhi Agarwal and Sheel Sharma. APPRAISAL OF GARDEN CRESS (Lepidium sativum L.) AND PRODUCT DEVELOPMENT AS AN ALL PERVASIVE AND NUTRITION WORTHY FOOD STUFF. . Indian Journal of Traditional Knowledge . 2013 , 12(4), 699-706.

5. Gupta, Chhavi and Singhal, Surbhi (2011). Effect of garden cress seeds and amla intervention on the haemoglobin status of non pregnant women (18-25 years). *Asian J. HomeSci.,* **6** (2) : 216-219.

6. Snehal Doke and Manisha Guha. Garden cress (Lepidium sativum L.) Seed - An Important Medicinal Source: A Review. J. Nat. Prod. Plant Resour ., 2014, 4 (1):69-80

7. Hurrell R, Egli I. iron bioavailability and dietary reference values. Am J Clin Nutr. 2010;91:1461-7s. [Pub med]

8. Pasricha SR, Black J, Muthayya S, Shet A, Bhat V, Nagaraj S, Shet AS ; Determinants of Anemia Among Young Children in Rural India. American Academy of Pediatrics, 2010; 126(1):140-149.

9. Nimmathota Arlappa, Indrapal I Meshram, Nagalla Balakrishna, Rachkula Harikumar, Kodavanti Mallikharjuna Rao, Avula Laxmaiah(2014) Prevalence of anaemia among different physiological groups in the rural areas of Maharashtra. INDIAN JOURNAL OF COMMUNITY HEALTH / VOL 26 / ISSUE NO 03 / JUL – SEP 2014

10. To study the status of anaemia in young female population of aurangabad region
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11. Kalaivani K.(2009). Prevalence & consequences of anaemia in pregnancy.Indian Journal Med Res, 130(5), 627-33.