A Comparative Study to Evaluate the Effectiveness of Iron and Vitamin C Supplement Versus Diet Rich in Iron and Vitamin C in Improving Hemoglobin Level among Adolescent Girls in Selected Rural Areas at Madurai

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Abstract: *The study was undertaken to evaluate the effectiveness of Iron and Vitamin C supplement versus diet rich in Iron and Vitamin C in improving hemoglobin level among adolescent girls in selected rural areas. <u>Design</u>:Two groups Pre-test and Post- test quasi -experimental design.<u>Setting</u>:This study was conducted in Poolangulam rural area at Madurai. <u>Subject</u>: about 60 Adolescent girls. <u>Methods</u>: The tools used for data collection were a questionnaire, checklist to find out the signs and symptoms of anemia and Sahil's hemoglobinometer for estimating hemoglobin level.The intervention was given in two forms of supplementation; the experimental group I received supplementation in the form of Tablets (Tab.Ferro Plus 308 mg. and Tab. Vitamin C 500mg.) and the experimental group II received supplementation in the form of diet (Multi -nutritional flour mix of 200 grams and Amla Fruit one number) both supplementations provide 100mg of elemental Iron and 500 mg of Vitamin C. <u>Result</u>: The mean posttest hemoglobin level of experimental group I(9.51) and mean posttest hemoglobin level of experimental group II (9.52)was higher than the pretest hemoglobin level. The obtained 't' valuve was 0.05 at df 29 which was not significant at p>0.05 level. This indicates that the difference between the mean (0.01) was a fall in the acceptance region.so the researcher rejected research hypothesis and support the null hypothesis. There is no association between the hemoglobin level and selected demographic variables and clinical variables.*

Keywords: Comparative, Effectiveness, Iron and Vitamin C Supplement, Iron and Vitamin C Rich Diet, Hemoglobin, Adolescent girls

1. Introduction

The following **Objectives** were set for the study.
- To assess the hemoglobin level before and after the intervention among experimental group I.
- To assess the hemoglobin level before and after the intervention among experimental group II.
- To identify the effectiveness of Iron and Vitamin C supplement in improving hemoglobin level among experimental group I.
- To identify the effectiveness of diet rich in Iron and Vitamin C in improving hemoglobin level among experimental group II.
- To compare the effectiveness of Iron and Vitamin C supplement versus diet rich in Iron and Vitamin C in improving hemoglobin level among experimental group I and Group II.
- To find out the association between hemoglobin level and selected demographic variables such as age, income of the family member and occupation of the samples.
- To find out the association between hemoglobin level and selected clinical variables such as dietary pattern, menstrual history and history of anemia.

The following **hypotheses** were set for the study. All hypotheses were tested at 0.05 level of significance.
- The mean post - test hemoglobin level will be significantly higher than the mean pre - test hemoglobin level among the adolescent girls in experimental group I who received Iron and Vitamin C supplementation.
- The mean post - test hemoglobin level will be significantly higher than the mean pre - test hemoglobin level among the adolescent girls in experimental group II who received Diet rich in Iron and Vitamin C.
- There will be significant difference in post hemoglobin level among experimental group I who received Iron and Vitamin C supplementation and experimental group II who received Diet rich in Iron and Vitamin C.
- There will be a significant association between Hb level and selected demographic variables (age, income of the family members and occupation of the sample).
- There will be a significant association between Hb level and selected clinical variables (dietary pattern, menstrual history and history of previous anemia).

The conceptual frame work of this research was based upon J.W. Kenney's Open System model.

Design: Two group pre - test post- test quasi experimental design was used for this study.

Sampling technique: Simple randomization

Independent variable
Administration of Iron and Vitamin C supplement for group I,
Administration of diet rich in Iron and Vitamin C for group II.

Dependent variable
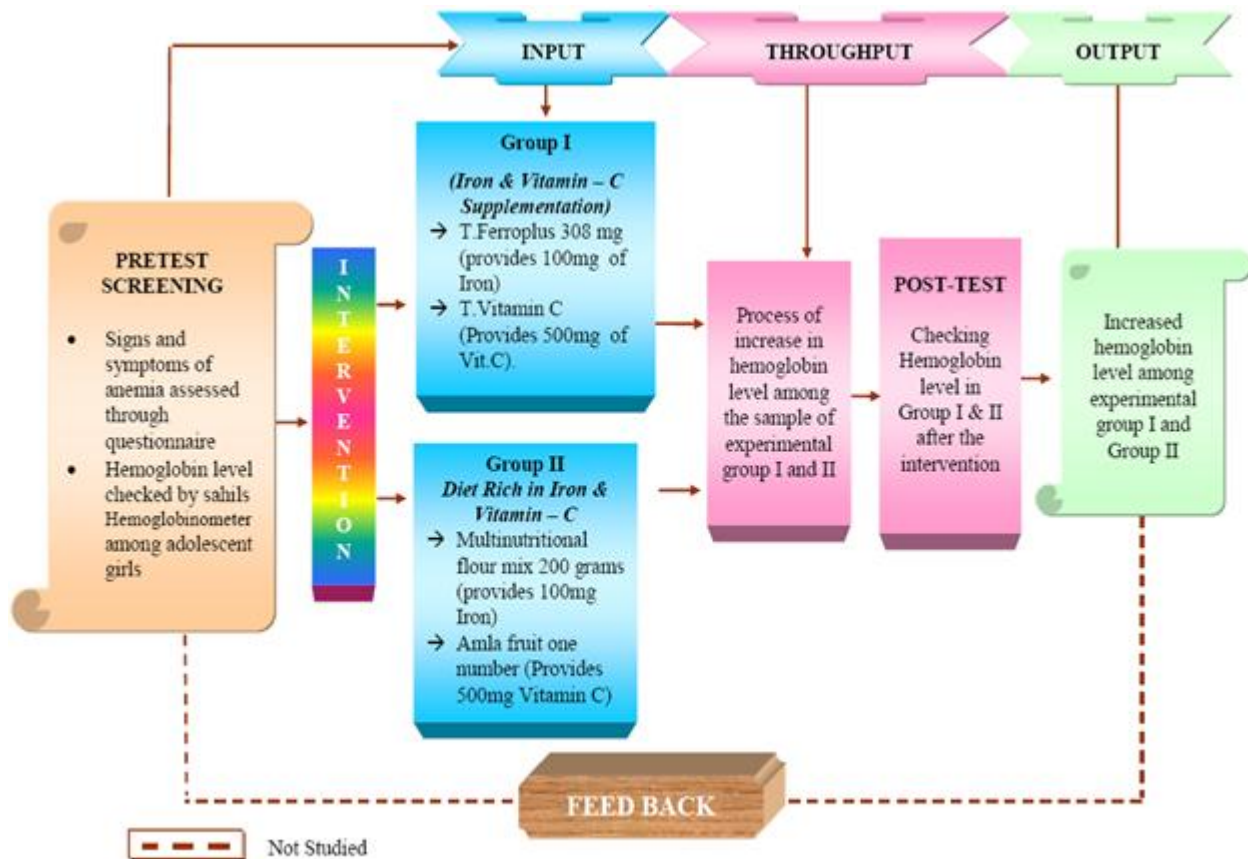Hemoglobin level among adolescent girls.

Figure 1 : Conceptual Framework Based on J.W.Kenny's Open System Model

The tools used for data collection were a questionnaire, checklist to find out the signs and symptoms of anemia and Sahil's hemoglobinometer for estimating hemoglobin level. The content validity of the tool was established by giving it to six experts in the field of general medicine, community medicine, dietician, and nursing personnel.

The setting chosen by the researcher was Poolangulaum rural village in Madurai district. The number of available adolescent girls (80) who fulfilled the criteria were selected and screened for anemia. Among that 60 subjects who had anemia below 12 mg/dl were selected for the study.

This group was divided into experimental group I and experimental group II by simple random sampling technique and intervention was provided for group I in the form of supplementation (T.Ferro plus 308 mg and T. Vitamin C 500 mg) for 30 days. The experimental group II received intervention in the form of dietary pattern (Multi- nutritional flour mix 200 grams and one number Fruit Alma) for 30 days. Both the interventions provide 100 mg elemental Iron and 500 mg Vitamin C per dose. The post - test was done 45 days after the pre - test. Descriptive statistics (percentage, mean and standard deviation) and inferential statistics (Chi-Square and T test) were used to analyze the data and to test hypothesis.

2. Major Findings of the study

- Majority in both the groups, 29 (96.67%) and 26 (86.67%) had the family income more than Rs .1000/ month, respectively. With regard to the number of children in the family 7 (23.33%) in experimental group I and 8 (26.67%) in experimental group II had more than two children. 16 (53.34%) of the sample in experimental group I and 13 (43.33%) in experimental group II represented 11-13 years of age. Regarding education of the subjects, 22 (73.33%) had secondaryeducation, and none in both the groups had graduate education. Regarding occupation of the sample, 18 (60%) in experimental group I and 17 (56.67%) in experimental group II were employed.

- Most of the subjects, 13 (43.33%) in group I and 15 (50%) in group II had the height is above expected level i.e. 150 Cms. There is none in both the groups who had health problems at present.21 (70%) in group I and 24 (80%) in group II had the onset of menarche between the age of 13-15 years. Majority in both the groups, 26 (86.67%) and 28 (93.33%) had regular menstrual cycle. In both the groups 28 (93.33%) had moderate blood loss during menstruation. 27 (90%) in group I and 26 (86.67%) in group II had non -vegetarian type of diet. 15 (50%) in group I and 21 (70%) in group II had intake of green leafy vegetables once in a week. In both the groups 27(90%), 26 (86.67%) had occasional intake of Iron rich animal source , 26 (86.66%)in group II had the occasional habit of consuming tea and coffee along with food. In both the groups 27(90%) occasionally consume fruits like amla,guava,papaya ect. There is none in both the groups who had previous history of anemia and treated with Iron supplement.

- In experimental group I, there is an increase in hemoglobin level.The subjects with hemoglobin level below 7.9 mg/dl was 4(13.3%) in pre-test.This reduced

to 3(10%) in post –test.. There is an increse in 4(13.3%)of sample with 11-11.9mg/dl in post test where there was none in this group in the pre-test.

- In experimental group II, ther is an increse in hemoglobin level. The subjects with hemoglobin level below 7.9 mg/dl was 3(10%) in pre-test. This was reduced to 2(6.6%) in post –test..There was an increse in number of subjects hemoglobin level 10-10.9mg/dl from 6(20%)in pre-test.to 10(33.4%) in post-test

- Mean Hb level (9.51) after administration of Iron and Vitamin C supplement was higher than the mean Hb level (9.16) before administration of Iron and Vitamin C supplement to adolescent girls.

- Mean Hb level (9.52) after administration of diet rich in Iron and Vitamin C was higher than the mean Hb level (9.19) before administration of diet rich in Iron and Vitamin C to adolescent girls.

- There is a significant difference in mean post - test Hb level of experimental group I (9.51) who received Iron and Vitamin C supplement and experimental group II (9.52) who received Diet rich in Iron and Vitamin C.

- There is no association between the hemoglobin level and selected demographic variables and clinical variables.

3. Conclusion

- Iron deficiency anemia is very common among adolescent girls in age group of 11-19 years.
- The mean hemoglobin level among adolescent girls after administration of Iron and Vitamin C was higher than the mean hemoglobin level before administration of Iron and Vitamin C.
- The mean hemoglobin level among adolescent girls after administration of Diet rich in Iron and Vitamin C was higher than the mean hemoglobin level before administration of Diet rich in Iron and Vitamin C.
- Both interventions were effective in correcting iron deficiency anemia among adolescent girls.
- So the researcher concluded that both the interventions are applicable to the adolescent girls. According to the availability, affordability and convenience of the subjects, the interventions can be done in the community setting for correction of anemia, dietary intervention are required on a long term basis with intermittent supplementation.
- There was no association between the hemoglobin level and selected demographic variables and clinical variables.
- As the ICDS nutritional mix was available in the local, this can be utilized for the correction and prevention of anemia among adolescent girls.

On the basis of the findings of the study it is recommended that
- Similar study can be conducted for a larger group for a longer period.
- These interventions can be tested by following true experimental design.
- Study also can be conducted in different age groups.
- Risk factor analysis and cor relational study can be designed.