



A STUDY TO COMPARE THE EFFECTIVENESS OF GOOSEBERRY JUICE WITH HONEY VERSUS RIPE GUAVA JUICE WITH HONEY ON THE LEVEL OF HAEMOGLOBIN AMONG ADOLESCENT GIRLS WITH ANAEMIA STUDYING IN SELECTED SCHOOLS AT DHARMAPURI DIST, TAMIL NADU

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ABSTRACT

The aim of this study is to compare the effectiveness of Honey mixed gooseberry juice with Honey mixed ripen guava juice on the level of hemoglobin among anaemic adolescent girls (mention the mean Hb level) studying in selected schools at Dharmapuri dist, Tamilnadu. True experimental design was used for this study. 30 iron deficiency anaemic adolescent girls were selected from schools at Dharmapuri district Tamilnadu. The samples were divided in to 3 groups by simple random sampling. Hb level of the samples was measured as pretest. The mean Hb was found to be 9.83gms. Group -I was given honey mixed 30ml of gooseberry juice. Group-II was given 30ml of honey mixed ripen guava juice. Group-III which is the control group not given any juices. The post test Hb level was monitored for all the samples after 45 days. The mean Hb increased to 11.4 grams. Paired t-test had been applied to compare the pre and post test hemoglobin levels and to decide whether it had been statistically significant. The P-value 0.007 infers that intervention has been effective in increasing the hemoglobin value at post test. Similarly the paired t-test also was used to assess the effectiveness of group II intervention with group III control group. The non-significant p-values of the group II and group III infers that these two interventions were not statistically effective in changing the hemoglobin levels at 45th day. Therefore the study revealed that gooseberry juice with honey helps to absorb the iron and increase the Hb level among iron deficiency anaemic adolescent girls.

KEY WORDS: Anaemia, Adolescent girls, Effectiveness, Honey mixed Gooseberry juice, Honey mixed ripen Guava juice, Haemoglobin.



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INTRODUCTION

Anaemia is one of the most common and intractable nutritional problems globally, affecting both developing and developed countries with major consequences for human health as well as social and economic development. Iron deficiency anaemia occurs at all stages of the life cycle, but is more prevalent in adolescents. Iron deficiency anaemia (IDA) constitutes the major anaemia during adolescent period.¹ In India the prevalence rate of anaemia among adolescent girls is 90%.² The prevalence rate of anaemia is disproportionately high in north zone (Rajasthan) 98% and low in South zone (Andhra Pradesh) 33%.³ Adolescence is transitional period between childhood and adulthood marked by profound and significant physical, physiological, sexual and psychosocial changes.⁴ Accelerated development, hormonal changes, malnutrition and starting of menstrual periods in girls are major causes for iron deficiency anaemia in this period. Because iron is an essential element for the function of various organs, its deficiency may lead to impaired perception and learning difficulties ending up with declined school success.⁵ The other contributing factors are family, peers, onset of menstruation, irregular meals, lack knowledge in iron rich foods, altered diet pattern, worm infestations and improper hand washing.⁶ The impacts of iron deficiency anaemia include decreased maximum aerobic capacity, decreased athletic performance, lowered endurance, decreased work capacity, impaired temperature regulation, depressed immune function, increased rates of infection, impaired cognitive functioning and memory, decreased school performance, compromised growth and development, increased lead and cadmium absorption, increased risk of pregnancy complications, including prematurity and fetal growth retardation.⁷ Given the magnitude of the problem, greater efforts are needed to develop and implement programs both to prevent and to control anemia.⁸ The purpose of the study was nutrients derived from natural sources in organic form are much easier to assimilate than synthetic nutrients. 100 grams of gooseberry contains 1.02mg of iron and 600mg of vitamin C. It is also a rich source of antioxidants, vitamin A, fiber, potassium, magnesium, calcium, etc.⁹ 100 grams of honey contains 0.4mg of iron. The iron in honey and gooseberry juice, in particular, is noted for easy assimilation than man-made forms of iron because of high vitamin C value gooseberry. Because Vitamin C is very vital in absorptions of Iron.

METHODOLOGY

Sample and setting

True experimental research design was used for this study after obtaining institutional ethical committee approval.¹⁰ The study was conducted among iron deficiency anaemic and the mean Hb was found to be 9.83, 10.14 and 10.32 respectively for group-I, group-II and group III, adolescent girls who studied in selected schools at Dharmapuri Dist, Tamil Nadu. Samples were divided in to three groups by simple random sampling technique.¹¹ Each group had 10 samples.

Inclusion Criteria: Adolescent girls

- i) having haemoglobin level below 10gms/dl
- ii) who attained menarche and having regular menstruation
- iii) who are willing to participate in the study
- iv) who are studying at selected schools at Dharmapuri

Exclusion Criteria: Adolescent girls

- i) who had major surgery within six months
 - ii) who are allergic to gooseberry juice
 - iii) who are allergic to ripe guava juice
 - iv) with the history of bleeding disorder
 - v) who are having the treatment of severe anaemia
- Human ethical committee Reg. No.007/12/2014/IEC/SU

The Tool

The tool has three divisions. Section A describes demographic profile of the samples. Section B consists of (a)Anthropometric data (Height, Weight, BMI, Blood Pressure, Pulse, Respiration) & (b)Biochemical data (Haemoglobin, Red Blood Cells, PCV). Section C includes (a)clinical Parameters like signs and symptoms of anaemia (pallor, sclera colour, nail changes, gums, pagophagia, hair colour, oedema), (b)dietary history (24 hours nutritional recall and 45 days nutritional recall) and (c)Menstrual history (Age at menarche, regular/irregular, duration, premenstrual syndrome, food habits during menstrual time, and past illness).¹²⁻¹⁴

The intervention

Gooseberry juice with honey versus Guava juice with honey

The investigator extracted 25 ml of gooseberry juice and mixed it with 5ml of honey and made 1 group of anaemic adolescent girls to drink before meals. Similarly 25ml of ripen guava juice was extracted which was mixed with 5ml of honey and was given to II group of samples before meals. The interventions were carried out for 45 consecutive days. Group III did not receive any intervention.

Data collection

Data collection was done in 3 phases, i.e. (Pre-test – intervention – Post-test). Pre-test was conducted on one week (Monday to Saturday) in selected schools at Dharmapuri. The Hb level of all group was measured as pre test. The intervention was given to the adolescent girls per head per-day at once before meal consequently for 45 days for experimental group –I (gooseberry juice with honey), experimental group – II(guava juice with honey), and no intervention in control group. As Post-test the Hb was again measured after 45 days for three groups.

RESULTS

Descriptive (Mean, Standard deviation) and inferential statistics (paired't' test and independent't' test) was used.¹⁵ The main objective of the study was to compare the pre and post test Hb level of three groups. The improvement mean obtained for post test between experimental group I, group II and control group for the level of haemoglobin was found to be 11.4, 10.1 & 10.3 respectively for which the "p" calculated value obtained was 0.007, 0.662 & 0.693 respectively which was found to be highly significant at p<0.001.

Table 1
Mean and SD of Haemoglobin level by group wise at pre- test

Group	Mean	SD	One way ANOVA F-value	P-value
I	9.830	0.5250	1.993	0.156
II	10.140	0.3204	-	-
III	10.320	0.7391	-	-

Table 1 shows the mean and standard deviation of the Haemoglobin level by group wise before intervention. The mean Hb was found to be 9.83, 10.14 and 10.32 respectively for group-I, group-II and group III. One way

ANOVA test has been applied to compare the three mean values. The non-significant p-value infers that all the three groups are having similar hemoglobin level before intervention.

Table 2
Mean and SD of Haemoglobin levels at pre and post tests for each group separately

Group	Pre test		Post test		Paired t-test value
	Mean	SD	Mean	SD	
I	9.830	0.5250	11.400	1.4922	3.452
II	10.140	0.3204	10.160	0.3502	0.452
III	10.320	0.7391	10.300	0.7272	-0.408

Table 2 shows the mean and standard deviation of level at pre and post tests for each group. Before intervention, the mean Hb was found to be 9.83 gms after the intervention it has been increases to 11.4gms. Paired t-test has been applied to compare whether increase in the haemoglobin has been statistically significant. The P-value 0.007 infers that intervention has been

effective in increasing the haemoglobin value at post test. Similarly the paired t-test has been applied to assess the effectiveness of group II and group III interventions. The non-significant p-values of the group II and group III infers that these two interventions are not statistically effective in changes in the haemoglobin levels at 45th day.

Figure 1
Mean and SD of Haemoglobin levels at pre and post tests for each group separately

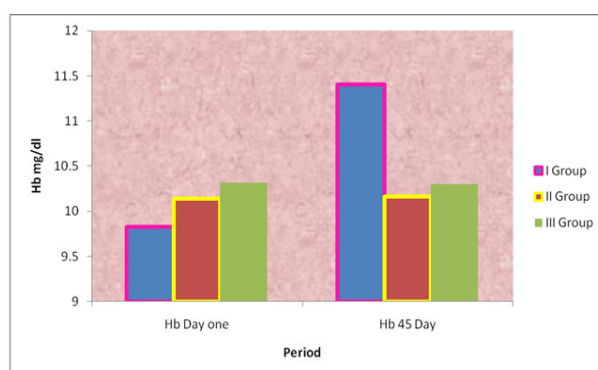


Table 3
Mean and SD of Haemoglobin level by group wise at post- test

Group	Mean	SD	One way ANOVA F-value	P-value	Scheffe's Multiple comparison test result
I	11.400	1.4922	4.807	0.016	G1>G2=G3
II	10.160	0.3502	-	-	-
III	10.300	0.7272	-	-	-

Table 3 shows the mean and standard deviation of haemoglobin values by group wise at post-test. The significant p-value clearly infers that the three mean Hb values are statistically different at post-test. Further

Scheffe's multiple comparison test has been applied to find out which of the groups are different. The result infers that Group I Hb level is significantly increased than the group II and group III.

Table 4
Mean and SD of difference in Haemoglobin level between pre and post tests by group wise

Group	Mean	SD	One way ANOVA F-value	P-value	Scheffe's Multiple comparison test result
I	1.5700	1.43840	11.674	<0.001	G1>G2=G3
II	0.0200	.13984	-	-	-
III	-0.0200	.15492	-	-	-

Table 4 shows the mean and standard deviation of the difference in haemoglobin level between the pre and post tests by group wise. The difference between post and pre test has been calculated. The mean difference of the three groups has been compared with one way ANOVA test. The significant p-value infers that the mean differences between three groups are statistically different. Further scheffe's multiple comparison test also infers that Group I is superior than the other two groups. The current study is essential, despite its restrictions, in that it can serve as a baseline for future impact assessments, and an essential component of adolescent health evaluation in India. Because adolescent health and nutrition status has an inter-generation effect. Therefore adolescence is one of the important stages of life cycle in terms of health intervention. The similar findings were supported by a study conducted Gopaldas (2002), anemia prevalence was reduced by giving gooseberry juice to one unit and the pre-post impact were in unit 1, 2, and 3 the hemoglobin status of the women improved significantly from 11.10 to 12.30 g/dl, 11.20 to 12.70 g/dl, and 11.50 to 13.00 gm/dl, respectively. In unit 4 there was no change, the values were 10.90 g/dl before and after intervention.¹⁶

DISCUSSION

Iron deficiency anaemia is widely prevalent in young adolescent girls. With the onset of menarche, marriage,

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CONCLUSION

The result of the study reveals that adolescent girls who are at high risk for iron deficiency anaemia will benefit from intake of gooseberry juice mixed with honey either regularly. Health education was given to adolescents and their parents regarding the important role of gooseberry and honey in preventing and correcting iron deficiency and they were emphasized to include them in their daily diet.

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