Original Research Article Nursing

International Journal of Pharma and Bio Sciences

ISSN 0975-6299

A COMPARATIVE STUDY TO ASSESS THE EFFECTIVENESS OF IRON AND FOLIC ACID SUPPLEMENTATION VS HONEY DATES AMLA MIX ON IRON DEFICIENCY ANAEMIA AMONG ADOLESCENT GIRLS RESIDING AT THE RURAL ORPHANAGE – PILOT REPORT

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ABSTRACT

Anaemia is the most common nutritional deficiency disorder in the world. Iron deficiency anemia is the most common type of anemia and easily treated condition that occurs when there is not enough iron in the body. It is important for girls to increase their consumption of iron-rich foods in rural area such as dates, amla (which is cheaper), red meats, fish, poultry and legumes, to prevent anemia. To determine the effects of iron and folic acid supplementation Vs honey dates amla mix on iron deficiency anemia among adolescent girls in residential home. True experimental research design are selected by simple random sampling technique for one group pre-test and post-test control group design. The study was conducted among 10 adolescent girls in experimental group and 10 in control group at selected residential homes. It shows that, when comparing the level of hemoglobin during pre test in experimental group all 10 samples had severe anemia 10(100%). And in control group also majority 80% of the adolescent girls had a severe anemia, 2 (20%) had moderate anemia. But when comparing the level of hemoglobin during post test in experimental group no one had severe anemia 20 % had mild anemia where as in control group majority 50% adolescence had mild anemia 1(10%) were moderate anemia. The study results reveals that improvement of hemoglobin is very high daily administration of honey dates amla mix comparing to weekly once administration of iron and folic acid supplementation. And also level of satisfaction is high in administration of Honey dates amla mix were comparing to iron and folic acid supplementation.

KEY WORDS: Iron deficiency anemia; level of hemoglobin; honey dates amla mix; Adolesc Residential home.

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Received on : 09-11-2016
Revised and Accepted on : 02-02-2017
DOI: http://dx.doi.org/10.22376/ijpbs.2017.8.2.b78-84

INTRODUCTION

Iron deficiency anemia (IDA) is one of the most prevalent nutritional deficiencies in the world, and more than half of the population in India is anemic. The prevalence of anemia is very high among adolescent girls (upto 60-70%) as the hemoglobin level is reported <120 g/L. Iron deficiency anemia leads to poor pregnancy outcome, impaired school performance, decreased work productivity and other adverse outcomes. Adolescence, a period of rapid growth and development, is considered the most nutritionally vulnerable group.[1] One in every five people in the world is an adolescent, and 85% of them live in developing countries (WHO). WHO identifies adolescence as the period in human growth and development that occurs after childhood and before adulthood, from ages 10 to19. Anaemia is widely prevalent in India and affects both sexes and all age groups.[2] Anaemia is a worldwide problem most commonly due to wide spread nutritional deficiencies. The prevalence of anemia in different parts of this country varies from 34.5% to 65% depending on availability of qualitatively and quantitatively adequate food in their respective families.[2] Among the adolescent girls the prevalence of anaemia is disproportionately high in developing countries, due to poverty, inadequate diet, worm infestations, and frequent attack of malaria in presence of poor access of health services.[3] Anaemia is the most common nutritional deficiency disorder in the world. IDA is the most common type of anemia and easily treated condition that occurs when there is not enough iron in the body. A lack of iron in the body can come from bleeding, not eating foods that contain iron, due to worm infestation common in rural area, or not absorbing enough iron from food that is eaten.[4] It is important for girls to increase their consumption of iron-rich foods in rural area such as dates, amla(which is cheaper), red meats, fish, poultry and legumes, to prevent anemia.[4] The overall iron requirement increases from a pre adolescent level of approximately 0.7-0.9mg iron/day to as much as 2.2mg iron/day or perhaps more in heavily menstruating young women.[5] A recent UNICEF's "State of the World's Children 2011" report says that more than half (56%)of adolescent girls in India are suffering from anemia. [6]

Need For The Study

Anaemia is widely prevalent in India and affects both sexes and all age groups.[7] The adolescent girls, constitute a vulnerable group on account of the practice of early marriages and potential exposure to a greater risk of morbidity and mortality. The prevalence of anaemia among girls (Hb <12 g%) and boys (Hb <13 g%) is alarmingly high as per the reports of NFHS-3 and the National Nutrition Monitoring Bureau Survey (NNMBS) as indicated that 55 % of adolescent girls are anaemic. Percentage prevalence of anaemia among adolescent girls in the age group 15–19 years and in the older age group 20–29 years remains almost stagnant at 55.8 % and 56.1 % respectively.[8] The Directorate of public health medicine, Government of Tamil Nadu (2007) conducted a study on prevalence of anemia among adolescent girls. The Study revealed that 65.6% In the rural and 85% of urban adolescent girls were anemic and also stated that 3.44% school adolescents were anemic out of which 59% of them received iron and folic acid tablets.[9] In females, adolescence marks the beginning of the menstrual cycle or reproduction. Adolescents gain 30% of their adult weight and more than 20% of their adult height between 10-19 years, which we call as growth spurt.[4] To prevent anemia during pregnancy, the adolescent girls should take 12gm by 12 years onwards. A study which was conducted in the rural areas of Tamilnadu revealed that the prevalence of anaemia among the adolescent girls was 44.8%. [10] Gerard j. et al.,(2013) had reported the inter mitten iron and folic acid supplementation and regular de-worming are effective initiatives to reduce iron deficiency anemia and worm infestation in adolescent girls. Malnutrition, chronic infections and worm infestations are contribute to a high prevalence of anaemia.[11] Though Govt. of India has focussed more on adolescent health through various national health programs still anaemia is prevalent among adolescent girls. The researcher observed that there is less focus on assessment and management of anaemia among adolescent girls. There is a long gap between what we know we actually practice. HDAM has significant effects on human blood and blood forming qualities due to its higher iron content and proved to be an excellent remedy for anemia.[12] Adolescent girls who are anaemic and may not be eating sufficient quantity of iron-rich foods to meet their needs may be advised, under the guidance of a doctor or other health professional, to take iron supplements. Thus the researcher is interested to conduct experimental study to assess the effectiveness of iron and folic acid versus honey dates with amla mix on iron deficiency anemia among adolescent girls. Hypothesis that There will be statistically significant improvement in the post test hemoglobin level in the experimental group than control group after administration of honey date amla mix.

Aim

To determine the effects of iron and folic acid supplementation Vs honey dates amla mix on iron deficiency anemia among adolescent girls residing in the selected orphanage.

Objectives

- To assess the prevalence among adolescents girls in both the group
- To assess the effectiveness of STP on iron deficiency anemia among adolescents girls in both the group
- To assess the effectiveness of honey dates and amla mix on improvement of haemoglobin level among adolescent girls.(in experimental group)
- To assess the effectiveness of iron and folic acid supplementation among adolescent girls (control group)
- To compare the hemoglobin level among adolescent girls between experimental group and control group
- To assess the level of satisfaction on Honey date with amla mix in experimental group
- To associate the post test level of hemoglobin with their selected socio demographic variables between experimental group and control group.

MATERIALS AND METHODS

Research Approach
Quantitative research approach

Research Design
True experimental two group pre test and post test design.

Setting
Selected intuitional homes at Kancheepuram.

Population
All adolescent girls with the age group between 13-18 years and having the haemoglobin level is between 8.1-11 gm/dl

Sample
The sample refers to adolescent girls in the age group of 13-18 years who are having the haemoglobin level is between 8.1-11 gm/dl and who are meet the inclusion criteria.

Sampling Technique
Simple random sampling technique

Sampling size
Pilot study sample size is 10% of main research study samples that is 10 samples I n experimental group and 10 samples in control group.

Sampling Criteria
Inclusion criteria
- Those who are willing to participate.
- Who are able to read and write Tamil.
- The adolescent girls who have age between 13-18 years.
- The adolescent girls having hemoglobin level less than 12gm
- Attained menarche
- Adolescent present during the study period.

Exclusion criteria
- Those who are not willing to participate
- The adolescent girls with other diseases like profile of bleeding disorder, if they take long term medication and psychologically depressed .
- The adolescent with any systemic disease (associated and illness)

Ethical Consideration
Ethical approval was obtained from the Scientific Review board and Institutional ethical committee of Saveetha University. Informed consent was obtained from the Head of the Institutions of Orphanage and also from the parents/Guardian, and also written assent was obtained from the Adolescents residing at institutional homes.

Data Collection Procedure
The pilot study was conducted after approved from Institutional Ethical committee member from December 2015 to March 2016 at selected institutional homes. Prior permission getting from director of the Gurukulam, for conducting the pilot study. The informed consent received from the research samples and their parents. The adolescent girls aged 13 to 18 years who are residing in the is selected as experimental group and control group. Both the hostel girls Peripheral blood were collected to assess the hemoglobin level. Totally 20 adolescent girls who had the anemia and met the other inclusion criteria were selected as sample for the study and among them 10 samples for experimental group and 10 samples were control group were selected by simple random sampling techniques by lottery method. The researcher obtained demographic variables, Body mass index was calculated using the standard formula (weight (Kg)/height (m2)). Percentage of anemic girls was calculated using WHO cutoff of 12 g/dL Hb. Under nutrition was defined as BMI < 5th percentile of Must et al. standards.[11] The check list were used for to find out the signs and symptoms of the iron deficiency anemia. 2ml of blood were collected from the each sample to assess the Bio chemical parameters such as hemoglobin, serum ferritin, iron transferring for iron building capacity and stool examination was done for both the control and experimental group. The pre-test was done to assess the knowledge on the iron deficiency anaemia was assessed by structured questionnaire. On the same day the teaching programme was given. After seven days, the post test was done by using the same structured questionnaires for both the group. After started the de-worming of each sample, the researcher administered the Honey dipped amla 1 and seedless dates 1 once a day, early morning for 16 weeks under the supervision of the investigator for the experimental group. Control group received the iron and folic acid supplementation. After every 21 days 2ml of blood obtained from peripheral vein to check the hemoglobin and serum ferritin level in the both the group.(Tab-2) The level of satisfaction was assessed by using relating scale at the end of the data collection both the control and experimental group.

Data analysis and interpretation
***Descriptive statistic*s**
Used for Frequency, percentage, mean, and standard deviation, to analyze the demographic variable, level of knowledge on IDA.

Inferential Statistics
For comparing means of the all variables at the end of the two different supplementation periods will be used paired t-tests. By using paired *t* test analyses the percent changes of all variables were compared between two groups.

RESULTS

Out of 10 samples majority of them belongs to the age group of 13- 15 years, the participants in experimental group were 6(60.0%) whereas in the control group 5(50.0%). The age group between the 16-18 years, the participants in experimental group were 4(40.0%), whereas in the control group 5(50.0%). Regarding religion, in the experimental group 6(60.0%) were Hindu, Christian 1(10.0%), whereas 9(90.0%) were Hindu in control group. Regarding Education status the 4(40.0%) participants in experimental group 9th std whereas

3(30.0%) were 10th std in control group. About type of the family 6(60.0%) had Nuclear family in experimental group whereas 5(50.0%) were in joint family in control group. Out of 10 participants 3(30.0%) were forth child in birth order in experimental group, where as 5(50.0%) had second child in control group. Both the groups had a Habits of taking coffee or tea 30 minutes before or after taking food both the groups 10(100.0%). Both groups of participants were taking oral supplementation 20 (100.0%). Various studies[13,14] have reported significant association of socio-demographic parameters like age, religion, socioeconomic status, diet, menarche status, literacy status of parents with anemia. However, in the present study, these socio-demographic parameters have not shown any statistically significant association with anemia ($P > 0.05$). Regarding History of parasitic infestation in the last 3 months, both the groups had 10(100%). Prevalence of anemia in experimental group were had 100% sever anemia were as control group is 80 % before the intervention. (Fig -1) Regarding the level of knowledge on iron deficiency anemia. The results shows that pre test Level of knowledge on iron deficiency anemia in experimental group, out of 10 adolescent girls had the mean value of 11.30 ±1.889 SD, whereas mean value of 9.30 with a standard deviation 2.263 in control group. Post test mean score knowledge was 18.40±1.955 SD in experimental group where as 19.90±1.792 SD with in control group.(Tab-1)

Haemoglobin Levels To Diagnose Anaemia (G/Dl)
Source: Haemoglobin concentration for the diagnosis of Anaemia and assessment of severity. WHO.[13]

Age groups	*No Anaemia*	*Mild*	*Moderate*	*Severe*
Children 6–59 months of age	*≥11*	*10–10.9*	*7–9.9*	*<7*
Children 6–59 months of age	*≥11.5*	*11–11.4*	*8–10.9*	*<8*
Children 12–14 years of age	*≥12*	*11–11.9*	*8–10.9*	*<8*
Non-pregnant women (15 years of age and above)	*≥12*	*11–11.9*	*8–10.9*	*<8*
Pregnant women	*≥11*	*10–10.9*	*7–9.9*	*<7*
Men	*≥13*	*11–12.9*	*8–10.9*	*<8*

Figure 1
Frequency and percentage distribution of prevalence of anemia among Adolescents girls in experimental and control group.

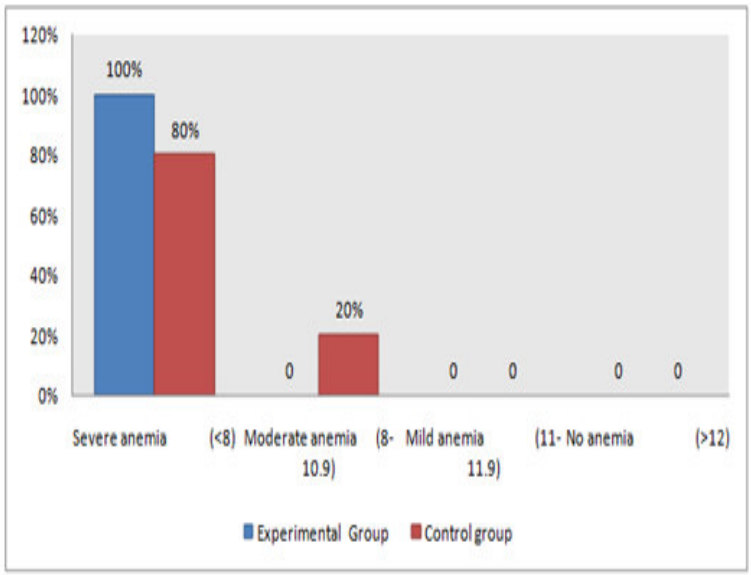

Table 1

Frequency distribution and of existing pre test and post test knowledge mean and SD on iron deficiency anemia among adolescents girls in both the group.

Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Knowledge of adolescent girls regarding Anemia. - Pre test	Experimental Group	10	11.30	1.889	.597
	Control Group	10	9.30	2.263	.716
Knowledge of adolescent girls regarding Anemia. - Post test	Experimental Group	10	18.40	1.955	.618
	Control Group	10	19.90	1.792	.567

Table 2

Effectiveness of honey dates amla mix on improvement of hemoglobin level among adolescent girls. (in experimental group)

Severity of Anaemia	Pre test		After 1st 21 days		After 2nd 21 days		After 3rd 21 days	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Severe anaemia <8	**10**	100%	**0**	0%	**0**	0%	**0**	0%
Moderate anaemia 8-10.9	**0**	0%	**10**	100%	**8**	80%	**1**	10%
Mild anaemia 11-11.9	**0**	0%	**0**	0%	**2**	20%	**3**	30%
No anaemia ≥12	**0**	0%	**0**	0%	**0**	0%	**6**	60-%

Table 3

To compare the pretest and post test level of hemoglobin among adolescent in Experimental group and control group.

Level of Haemoglobin	Sever anaemia		Moderate anaemia		Mild anaemia		No anaemia		Mean	Standard deviation	t- value
	N	%	N	%	N	%	N	%			
Pre test experimental group	10	100	-	-	-	-	-	-	7.360	.5641	8.063
Post test experimental group	-	-	-	-	-	-	10	100	12.700	.3916	23.508
Pre test control group	8	80	2	0	-	-	-	-	7.560	.4695	-9.498
Post test control group	-	-	1	10	5	50	4	40	11.700	.4643	19.247

Table 4

Level of satisfaction of administration honey dates amla mix and iron and folic acid among the experimental and control group.

Group Statistics

	Group	N	Mean	Std. Deviation	Std. Error Mean
Nature of the treatment	Experimental Group	10	38.20	2.440	.772
	Control Group	10	33.70	1.567	.496
Nature of the amla dates honey mix	Experimental Group	10	21.50	1.716	.543
	Control Group	10	18.50	1.179	.373
Total score	Experimental Group	10	59.70	3.622	1.146
	Control Group	10	52.20	2.348	.742

DISCUSSION

Previous studies says that only administration of iron and folic acid supplementation for daily and weekly administration in school setting. This study emphasized on comparison of the daily administration of HAD Mix Vs weekly once administration of iron and folic acid supplementation. The current study findings reveal that the adolescent girls have more interested to take the HAD mix comparing to take the iron and folic acid supplementation and also their clinical complaints was reduced after administration of Honey dates amla mix. When comparing to effectiveness of both intervention Majority of them have the severe anemia in experimental group in pre test. After administration of honey dates amla mix the Hemoglobin is increased gradually and severity of anemia was decreased at the end of the intervention. When comparing the both groups there is significant difference between the experimental group and control group in level of heamoglobin in pre test at >0.05.(Tab-3) In experimental group had majority of them had no anemia whereas control group had 50% mild anemia 10% moderate anemia in post test. When comparing to the level of satisfaction on both intervention group, the experimental group majority of them had a high satisfaction whereas comparing to the iron and folic acid supplementation is most of them had a moderately satisfaction.(Tab- 4)

CONCLUSION

The study was feasible. The prevalence of anaemia was high among girls who had attained menarche. The study results reveals that improvement of hemoglobin is very high daily administration of honey dates amla mix comparing to weekly once administration of iron and folic acid supplementation. And also level of satisfaction is high in administration of HDAM were comparing to iron and folic acid supplementation.(Tab-4)

ACKNOWLEDGEMENT

Author express sincere thanks to all the experts for their valuable suggestions.

1. Dr. P. Mangala Gowri, Principal, Saveetha college of nursing, Saveetha University, Thandalam.
2. Dr. Hepshibha Kerubhamani**,** *Saveetha Medical College and Hospital, Saveetha University,Thandalam.*
3. Dr. Vijayaragavan,Ph.D, Director of Research, Saveetha University, Thandalam.
4. Dr. Porchelvan,Ph.D, Saveetha University, Thandalam.
5. Mr. Subramaniyam, Secretary, Thiruvaloor Kapakam, Kancheepuram.

CONFLICT OF INTEREST

Conflict of interest declared none.

REFERENCES

1. Mittal M. Bhanushali, Abhay R. Shirode *, Yadunath M. Joshi, Vilasrao J. Kadam An intervention on iron deficiency anemia and change in dietary behaviour among Adolescent Girls, *Int J Pharm Pharm Sci.,2011:3(1):40-42*
2. Mathur JSS. A comprehensive text book of *Preventive and Social Medicine*, New Delhi: CBS Publishers and Distributors; 1st ed. 2007; p. 382-89
3. Rawat, C. M. S., Garg, S. K., & Singh, J. V. (2001). Socio demographic correlates of anaemia among adolescent girls in rural area of Meerut. *IJCM, 26*(4), p. 173-175.
4. Nayar PD, Mehta R. *Textbook of Preventive and Social Medicine*. Gupta P, Ghai OP editors . New Delhi: CBS Publishers and Distributors; 2nd ed. 2007; p. 428-37.
5. Lal S, Pankaj A. Editors. *Textbook of Community Medicine* (Preventive and Social Medicine). New Delhi: CBS Publishers and Distributors; 1st ed. 2007; 166-68.
6. G.Rajagopal. A Concise Text book of Biochemistry ,Ahuja Publishing House, New Delhi. 2 nd ed. 2010 p.203-205
7. UNICEF/WHO. Iron deficiency Anemia. Assessment, Prevention and Control. A guide for programme managers. Geneva: 2011. Available from: http:// southasia.oneworld.net/today
8. Park K. Textbook of Preventive and Social Medicine. Jabalpur: Banarsidas Bhanot Publishers. 23rd ed. 2015. P.465-466
9. National Nutrition Bureau. Prevalence of Micronutrient Deficiencies. Technical Report No 22. National Institute of Nutrition Indian Council of MedicalResearch. Hyderabad; 2003.
10. Rajaratnam J, Abel R, Asokan JS, Jonathan P. Prevalence of anaemia among the adolescent girls of rural Tamil Nadu. *Indian Journal of Pediatrics. December* 2000; 37 (7) 532-36.
11. A.Must, G. E.Dallal, andW.H.Dietz, “Reference data for obesity: 85th and 95th percentiles of body mass index and triceps skinfold thickness,” *American Journal of Clinical Nutrition*. 1991; 53(4) 839–846.
12. Alvarez-Suarez JM, Tulipani S, Romandini S, Bertoli E, Battino M. Contribution of honey in nutrition and human health: a review. Journal of Nutrition and metabolism. 2010; 20(3):15-23.
13. Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. Available from: WHO/NMH/NHD/MNM/11.1.,http:www.who.int/vmnis/indicators/haemoglobin.pdf.
14. Shilpa S. Biradar, Somashekar P. Biradar, A.C. Alatagi, A.S. Wantamutte, P.R. Malur Prevalence of Anaemia among Adolescent Girls: A One Year Cross-Sectional Study. Journal of Clinical and Diagnostic Research. 2012;6(3) : 372-377

15. Rawat CM, Garg SK, Singh JV, Bhatnagar M, Chopra H, Bajpai SK. Sociodemographic correlates of anaemia among adolescent girls in rural area of district Meerut. Indian J Community Med 2001;26(4):173.
16. Chondhary S, Mishra CP, Shukla KP. Nutritional status of adolescent girls in rural area of Varanasi. Indian J Prev Soc Med 2003;34(8):53-61.
17. Aditi Sen and Shubhada Kanani Intermittent Iron Folate Supplementation: Impact on Hematinic Status and Growth of School Girls. International Scholarly Research Network. 2012;6(2) Article ID 482153
18. Sulakshana S. Baliga, Vijaya A. Naik, Maheshwar D. Mallapur Nutritional status of adolescent girls residing in rural area: A community-based cross-sectional study Journal of the Scientific Society. 2014; 41(1) 75-81
19. Alvarez-Suarez JM, Tulipani S, Romandini S, Bertoli E, Battino M. Contribution of honey in nutrition and human health: a review. Mediterr J Nutr Metab 2010; 23(3):15-23.
20. Bunner & Suddarths. Text book of Medical Surgical Nursing. Janice L.Hinkle, Kerry H.Cheever editors Philadelphia. Wolter Kluwer company. 12th ed. 2014 . p. 825-827
21. Mohan Joshi1 & Raghvendra Gumashta Weekly Iron Folate Supplementation in Adolescent Girls – An Effective Nutritional Measure for the Management of Iron Deficiency Anaemia, Global Journal of Health Science; 2013;5(3) 52-58.

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We sincerely thank the above reviewers for peer reviewing the manuscript