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IMPACT OF CANDY "NUTRI-GLYKO" ON HEMOGLOBIN LEVEL AMONG ANEMIC ADOLESCENT GIRLS OF SAIKUL SUB-DIVISION, MANIPUR.

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Abstract: Iron deficiency anemia is the most common health issue prevalent among adolescent girls. The study aims to assess the effectiveness of the Candy "Nutri-glyko" in increasing the hemoglobin level in teenage girls from Saikul Sub-division, Manipur. A quantitative research approach was adopted, and a quasi-experimental research design was used for the study. The sample consists of 60 moderate anemics belonging to the age group of 15-18 years adolescent girls selected by using a non-probability purposive sampling technique. The samples were grouped into experiments and control groups with 30 samples in each group. The Candy "Nutri-glyko" 70 gm each was given for four consecutive weeks to the experiment group. The hemoglobin level was again tested in both groups and the 'p' value was found to be statistically significant at 0.000 ($p<0.05$) in the experiment group. The study concluded that the consumption of iron candy has a significant impact on the level of hemoglobin among the experimental groups.

***Index Terms*- Iron deficiency anemia, adolescent girls, candy**

1.INTRODUCTION

In India, according to the National Family Health Survey (NFHS-5) of 2019-2021, it was revealed that the incidence of anemia is still high in children which is about 67% of the population under the age of 15 whereas 57% of adolescents, women of reproductive age between 15 to 49 years were also found to be anemic. The prevalence of anemia is still a concern as it has become a serious public health problem among the Indian population(Let et al.,2024). Adolescent girls are more prone to iron deficiency because of their monthly menstruation where there is a loss of iron in the blood which amounts to up to 22mg iron loss in 45 ml of blood bleeding during their period which leads them more likely to be anemic(Jayasree et al., 2020). Kumudini (2018) found that in India, about 85% of the various kinds of anemia are caused by nutritional anemia spurred by an iron deficiency, that affects 50% of the general population. The condition of anemia can seriously affect Children's physical and intellectual growth which is negatively affected by iron deficiency anemia, which in turn impairs adult productivity and increases the risk of pregnancy and newborn mortality. Tiredness and poor health are related to anemia, which may decrease productivity and ability to work as well as have a detrimental effect on the national economy. During adolescence, as there is an increase in a growth spurt, they need more nutrients that are required to meet their body requirements, and 50 % of the adult weight and 20 % of overall height are acquired during their adolescence period. Mukesh Kumar and Pratap Chandra Mohanty(2023).Adolescents need to consume an appropriate amount of diet to avoid certain types of disease including iron deficiency anemia and other type of health complications. To protect themselves from anemia, inclusion of iron-rich foods, avoiding fast food and junk foods, eating meals on time, and imparting knowledge about anemia, eating nutritious food that is easily available and low-cost foods is necessary to decrease the burden of anemia. According to (Gurung Renu& Sharmila Pauline, 2018) consumption offood that contains high levels of iron along with vitamin C food sources in the diet will help in tracking the level of hemoglobin that will help in absorption as well as keep the level in a normal range and protect our body by maintaining optimal health status. As a quote" Prevention is better than cure" iron deficiency anemia should be prevented from the early stages of life and focus more on adolescent girls as they are vulnerable prey to anemia. The correct way of dietary habits and food-based approach have a greater chance of improving iron status. Therefore, a study was done to assess the effect of candy "Nutri-glyko" in improving the hemoglobin level among adolescent girls in selected schools Saikul sub-division, Manipur.

OBJECTIVES OF THE STUDY:

- To evaluate the level of hemoglobin before supplementation in both the experimental and control groups.
- To measure the level of hemoglobin after the intervention of candy "Nutri-glyko" in both groups.
- Comparison of the post-test hemoglobin level after intervention in both the experimental group and control group.

HYPOTHESIS

H_0: There is no significant increase in the level of hemoglobin after supplementation of the candy "Nutri-glyko".

H_1: There is a significant increase in the hemoglobin level after supplementation of the candy "Nutri-glyko".

2. MATERIALS AND METHODS

2.1. Study design: The study is a quasi-experimental pretest-posttest design aimed at evaluating the impact of candy "Nutri-glyko" consumption on the level of hemoglobin among adolescent girls.

2.2. Population and Sample: The population of the study was adolescent girls with anemia. 60 adolescent girls (only moderate) of age groups 15 to 18 years and studying in selected schools in Saikul, sub-division without complication, taking supplements, and fulfilling the inclusion criteria were selected, from which 30 samples each were assigned into experimental and control groups. Non-probability purposive sampling technique was used for the selection of the samples.

3. DATA COLLECTION

3.1. Section I: Demographic data: The data includes Demographic Data of the respondents (age, Age of menarche, Duration of menstruation, Regularity of menstruation, Flow of menstruation, type of diet) and the sample Hemoglobin level was measured using Haemocuemeteranalyzer301.

3.2. Section II: Assessment of pre-test and post-test hemoglobin levels among anemic females in experiment and control groups.

4. Intervention & Measure: 30 samples of the experimental group were given the candy "Nutri-glycol" (70 gm in the form of three candies) for four consecutive weeks and the remaining 30 samples of the control group, were not given any intervention. Post-test of blood samples was done to assess the level of hemoglobin for both groups. The candy "Nutri-glyko" was prepared by using finger millet, pearl millet, black rice, jaggery, mango, and amla powder. 100g of the candy "Nutri-glyko" provides about 377.33 kcal energy,80.83g of carbohydrate,8.95g of protein, 6.85 mg of Iron, and vitamin C 3.83mg.

5.STATISTICAL ANALYSIS

The data obtained were tabulated, analyzed, and interpreted using descriptive and inferential statistics. Socio-demographic data and level of hemoglobin were analyzed by using frequency & percentage distribution. Chi-square was used to test the association between the Socio-demographic data and the level of hemoglobin. The paired sample 't' test was used to compare the pre-test and post-test mean scores and the effectiveness of the candy "Nutri-glyko" in improving the hemoglobin level.

6. RESULT AND DISCUSSION

Table 1: Frequency and percentage distribution of anemic adolescent girls in experimental and control groups according to their demographic variables

Sl.no	Characteristics	Experiment group(n=30)	Control Group(n=30)	Chi-square value	Df	'p' value
		Frequency and percentage	Frequency and percentage			
1	Age					
	15-16	16(53.3)	9(30)	41.82	36	0.23
	17-18	14(46.7)	21(70)			
2	Age of menarche			36.56	36	0.44
	<12 years	11(36.7)	5(16.7)			
	>12 years	19(63.3)	25(83.3)			
3	Regularity of menstruation			83.56	72	0.16
	Regular	19(63.3)	24(80)			
	Irregular	11(36.7)	6(20)			
4	Duration of menstruation			31.68	36	0.67
	1-3 days	12(40)	10(33.3)			
	4-5 days	12(40)	15(50)			
	6 and above days	6(20)	5(16.7)			
5	Flow of menstruation			76.59	72	0.33
	Less	2(6.7)	6(20)			
	Normal	21(70)	22(73.3)			
	Heavy	7(23.3)	2(6.7)			
6	Type of diet			60.00	36	**0.00***
	Vegetarian	1(3.3)	1(3.3)			
	Non-vegetarian	29(96.7)	29(96.7)			

*Significant at p-value (<0.05)

From Table 1: Distribution of anemic females according to their demographic variable. In the experimental group, 16(53.3%) of them belonged to the age group of 15-16 years, and 14(46.7%) of them belonged to the age group of 17-18 years. In the Control group, 9(30%) of them belonged to the age group of 15-16 years, and 21(70%) were in the age group of 17-18 years. The age of menarche in experiment groups 11(36.7%) have in <12 years and 19(63.3%) in >12years. In control groups 5(16.7%) have in <12 years and 25(83.3%) in >12 years. Of the regularity of menstruation in experimental groups, 19(63.3%) have regular periods, and 11(36.7%) have irregular periods. 24(80%) have regular and 6(20%) have irregular monthly period in control group. For the monthly days period in the experiment group, 12(40%) have 1-3 and 4-5 days and 6(20%) have 6 and above days. In control groups 10(33.3%) have 1-3 days, 15(50%) 4-5 days and 5(16.7%) 6 and above days in a month. In experiment groups, 2(6.7%) have less flow, 21(70%) normal and 7(23.3%) heavy flow of period. In control group 6(20%) have less, 22(73.3%) normal, 2(6.7%) heavy flow of period. The diet in both the experiment and control group 1(3.3%) are vegetarian and 29(96.7%) are mixed.

The Chi-square value showed that the demographic variables such as age, age of menarche, duration of menstruation, and regularity of menstruation, were not found to be statistically significant except for dietary patterns.

Table 2: Mean, SD, ‘t’ value, and ‘p’ value of pre-test and post-test hemoglobin level in the control group (N=30)

Pre-test Mean±SD	Post-test Mean±SD	‘t’ test value	‘p’ value
9.93±0.57	9.84±0.73	1.01	0.3

Table 2, the pretest score of hemoglobin level in the control group was found to be 9.93±0.57and post-test mean score of hemoglobin level in the control group was found to be 9.84±0.73 There was no change as it was not treated and was found not statistically significant with ‘t’ value 1.01 and ‘p’ value 0.3 at the degree of freedom 29 at 0.05 level of significance

Table 3: Mean, SD, ‘t’ value, and ‘p’ value of pre-test and post-test hemoglobin levels in the experimental group (N=30)

Pre-test Mean±SD	Post-test Mean±SD	‘t’ test value	‘p’ value
9.69±0.63	12.42±0.95	14.88	.000

Table 3, shows that the mean pretest score of hemoglobin level in the treatment group was 9.69±0.63 and the mean post-test score of hemoglobin in the treatment group was 12.42±0.95. There was an increase in the mean score which shows that there was effectiveness in the treatment group and was found to be statistically significant as a ‘t’ value of 14.88 at the degree of freedom 29 at 0.05 level of significance.

Table 4: Comparison of mean scores of Hemoglobin (g/dl) of moderate anemic subjects

Group	Mean hemoglobin	Value	difference	't" test value	'p' value
	Pre-test	Post-test			
Experiment group	9.69±0.63	12.42±0.95	**2.73**	14.88	**.000***
Control group	9.93±0.57	9.84±0.73	0.09	1.01	0.3

*Significance at p<0.05 level

Table4 Comparison of mean scores of Hemoglobin for moderate anemic subjects, revealed the mean hemoglobin level in the pretest of the experimental group was 9.69±0.63 g/dl for the moderate anemic group of the subjects. At the end of the study, it was observed as 12.42±0.95 g/dl with a difference of 2.73 g/dl. with inferential statistical analysis of the 't' test, it showed that the difference between the two means of hemoglobin level of the experimental group was found significant at a five percent level. In the control group, the pretest was 9.93±0.57 g/dl and in the post-test, it was 9.84±0.73 g/dl with a difference of 0.09g/dl and was found not statistically significant.

The results from the above table 4 show that the mean Hemoglobin levels of the experimental group are greater than control group. Hence, the H_0 hypothesis is accepted and the H_1 hypothesis is rejected as the candy "Nutri-glyko" is effective in increasing the hemoglobin level of adolescent girls.

With a statistically significant p-value of less than 0.05 in the experiment group, it can be concluded that the effect of candy "Nutri-glyko" in the moderate anemic girl is effective as there is an increase in the hemoglobin level at the end of the study.

7. DISCUSSION

The study revealed that the majority of the adolescent girls i.e. 70% of the age groups belong to 17-18 years. The present study is supported by (Negi et al.,2023) who also found that most of the moderate anemic adolescent girls belong to 17-18 years in both the control and experiment groups. The study finding also showed that there was an increased level of hemoglobin among the experiment group when given a candy "Nutri-glyko".The present finding is also seen in a study conducted by Selvina et al., (2021) where a pre-experimental study to assess the effectiveness of ragi balls on hemoglobin levels among adolescent girls was done. A supplement of the nutritive ball to see the impact on hemoglobin levels among teenage girls with anemia by Negi et al (2023) showed an increase in hemoglobin among the moderate anemic adolescent group. Another study that supported the finding is the study findings of the nutrient grain ball which is very effective on hemoglobin levels among adolescent girls with anemia (Waghmare,2020).

The Chi-square value showed that demographic variables such as age, age of menarche, duration of menstruation, and regularity of menstruation, except dietary patterns, were not found to be significant. The same result was also seen and supported in the study done by Moharana et al., (2021), Selvina et al., (2021) where there is no association between the demographic variables and the hemoglobin level of the sample.

CONCLUSION

It was concluded that the supplementation of candy "Nutri-glyko" can effectively increase hemoglobin levels among adolescent girls. Thus, the results suggest that Nutri-glyko may be a beneficial approach in combating iron deficiency anemia. So, the inclusion of Nutri-glyko in their diet may be a feasible and affordable way to increase the hemoglobin level among the subjects also candy is convenient to carry and can be consumed at any time of the day.

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