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Effectiveness of salubrious nutri mix on level of haemoglobin among pre-menopausal women residing in selected areas of rural community.

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Abstract

Anaemia is a condition when the haemoglobin concentration, or the quantity and size of red blood cells, are below predetermined cut-off values. As a result, the blood's ability to carry oxygen to the body is compromised. According to the World Health Organization (WHO), out of the South Asian countries prevalence of anaemia is highest in India. The prevalence of anaemia is alarmingly high in India due to low dietary intake of iron (less than 20 mg/day) and folic acid intake (less than 70 mg/day); poor bioavailability of iron (3-4%) in phytate and fibre-rich Indian diet; and chronic blood loss due to infection such as malaria and hookworm infestations.

METHDOLOGY

The researcher used a quantitative research approach in the present study. The research design that is chosen for this study is a quasi-experimental non-equivalent control group design. The population was pre-menopausal women residing in selected areas of rural community. The sample consisted of 60 pre-menopausal women residing in a selected area of the rural community. The sampling technique used was the non-probability purposive sampling technique. The setting was a selected area of rural community. Digital Haemoglobinometer was the tool to assess the level of haemoglobin among pre- menopausal women. The intervention given to the selected samples was a salubrious nutri mix. In this study, Salubrious nutri mix is a mixture of 5 food items (peanut powder 40 grams, jaggery powder 35 grams, chana dal powder 25 grams, sesame seeds 3 – 4 seeds and ½ tablespoon of ghee) to prepare 100-gram laddu. The content validity of the tool was done and was found to be 0.97. The study was done for 27 days. Salubrious nutri mix was administered to the experimental group of 30 pre-menopausal women and was not administered to the control group of 30 pre-menopausal women. The post-test was collected on the 27th day.

Result

The analysis of the study was done using descriptive and inferential statistics. The master sheet was prepared and coding of the responses was done. The data was presented in the form of tables and charts. Statistics were performed with the help of paired t-tests, un-paired t-tests and chi-square tests.

The results indicate that the mean pre-test haemoglobin level was 10.33 g/dL (SD = 0.55), whereas the mean post-test haemoglobin level was 11.46 g/dL (SD = 0.59). The calculated t-value is 13.97, which is significantly higher than the table value (2.045 at $p \leq 0.05$, DF = 29).

For the experimental group, the p-value (0.001) is less than 0.05, indicating a statistically significant improvement in haemoglobin levels after the intervention. This suggests that the intervention was effective in increasing haemoglobin levels among pre-menopausal women in the experimental group. The results indicate that the mean pre-test haemoglobin level was 10.26 g/dL (SD = 0.51), whereas the mean post-test haemoglobin level was 10.22 g/dL (SD = 0.53). The calculated t-value is -0.54, which is lower than the table value (2.045 at $p \leq 0.05$, DF = 29).

For the control group, the p-value (0.591) is greater than 0.05, indicating that there is no statistically significant difference between pre-test and post-test haemoglobin levels in the control group. This suggests that there was no significant change in haemoglobin levels among premenopausal women who did not receive the intervention in control group.

The unpaired t-test was conducted to compare the post-test haemoglobin levels between pre-menopausal women in the experimental group and the control group.
The results indicate that the mean post-test haemoglobin level was 11.46 g/dL (SD = 0.59) in the experimental group and 10.22 g/dL (SD = 0.53) in the control group. The calculated t-value is 8.56, which is higher than the table value (2.001 at $p \leq 0.05$, DF = 58).
The p-value (0.001) is less than 0.05, indicating a statistically significant difference between the post-test haemoglobin levels of the experimental and control groups. This suggests that the intervention had a significant positive effect on improving haemoglobin levels among pre-menopausal women in the experimental group.
The chi-square test results suggest that type of diet and education show a significant association with haemoglobin levels ($p < 0.05$). However, age, religion, monthly income, and occupation do not show a significant association with haemoglobin levels ($p > 0.05$).
KEY WORDS: Salubrious nutri mix, pre-menopausal women, level of haemoglobin.

INTRODUCTION

Anaemia is the most common nutritional deficiency disorder in the world. About one-third population of the world is anaemic. Out of the entire world prevalence of anaemia in South Asian countries is highest. According to the World Health Organization (WHO), out of the South Asian countries prevalence of anaemia is highest in India. The prevalence of anaemia is alarmingly high in India due to low dietary intake of iron (less than 20 mg/day) and folic acid intake (less than 70 mg/day); poor bioavailability of iron (3-4%) in phytate and fibre-rich Indian diet; and chronic blood loss due to infection such as malaria and hookworm infestations.

About 24.8% of people worldwide are thought to suffer from anaemia. 1.625 billion people worldwide are being impacted by it. In India, anaemia affects 74.3% of the population, making it a serious health issue. In India, anaemia affects 58% of pregnant women, and it accounts for 20–40% of maternal deaths. India accounts for 80% of maternal deaths in the South Asian area caused by anaemia. According to NFHS 3 data, the prevalence rates of anaemia in boys and girls are <12g% and <13g%, respectively, and over 55% of teenage girls had anaemia according to the National Nutrition Monitoring Bureau Survey. The prevalence of anaemia was essentially unchanged, with 55.8% and 56.1% of females in the 15–19 and 20–29 age groups, respectively, reporting anaemia. In Gujarat, the prevalence of anaemia is 62.6% in children, 21.7% in males, and 54.9% in women. In the district of Anand, 50.3% of women experienced anaemia in the 2015–16 fiscal year.

Iron deficiency anaemia will be prevented by adequate dietary intake of iron such as green leafy vegetables such as amaranth, spinach, coriander leaves, drumstick leaves, radish leaves, vegetables such as beetroot, drumstick, cereals like ragi, barley, cholam (Sorghum), rice (raw milled), legumes like Bengal gram dhal, Black gram dhal, soybean, Nuts and oil seeds like dates, cherry, fruits such as chickoo, pomegranate and jaggary.

Background of study

Anaemia as a global public health problem is as compelling and harmful as the epidemics of infectious diseases. To assess the prevalence of anaemia among women. By using a descriptive survey design 245 women who met the criteria were selected with a purposive sampling technique in the selected urban areas. Hb estimation was done using the Tallquist method. Out of 250 women, 89 (35.6%) had their normal haemoglobin level (>12.0g/dl), 6 (2.4%) had mild anaemia (11-11.9 g/dl), 145 (58%) had moderate anaemia (8-10.9 g/dl) and 10 (4%) had severe anaemia (<8.0 g/dl). The incidence and prevalence of anaemia are high in developing countries like India, where the present study mainly focused on identifying the anaemic women in urban areas.

NEED OF STUDY

Pre-menopausal women are particularly prone to anaemia because of the increased demands for iron by the body. This anaemia not only affects the present status of the health of pre-menopausal women but also shows a deleterious effect on these women in the menopausal period. Because of monthly blood loss, iron deficiency is prevalent in pre-menopausal women, Iron deficiency anaemia may lead to shortness of breath, weakness, restless

leg syndrome, poor concentration, fatigue, Irregular heartbeat or rapid heartbeat. This can lead to an enlarged heart or heart failure. The best way to combat anaemia is supplementation with iron and folic acid tablets since the absorption of iron from Indian deities is too low. Anaemia continues to be a major public health problem worldwide, particularly among growing children, females of reproductive age and elderly people, especially in developing countries. The World Health Organization (WHO) estimates that anaemia affects approximately 1.62 billion people worldwide, corresponding to 24.8% of the human population. India has one of the fastest-growing youth populations in the world with an estimated 190 million of which 22% are girls. According to WHO, there are 2 billion people affected with anaemia, in India nearly 43,904,406 people are affected with anaemia. In Maharashtra state of India reported a very high prevalence of anaemia (87%) in adolescent girls & pre-menopausal women.

Iron-deficiency anaemia (IDA) among women in India is a problem of major public health significance. Using data from three waves of the National Family Health Survey, this article discusses the burden of and trend in IDA among women in India and discusses the level of iron and folic acid (IFA) supplementation and its potential role in reducing the burden of IDA. Between 2005-2006 and 2015-2016, IDA in India decreased by only 3.5 percentage points (from 56.5% in 2005-2006 to 53.0% in 2015-2016) for women aged 15-49 years. However, during the same period, of 27 states compared, IDA increased in eight: Delhi, Haryana, Himachal Pradesh, Kerala, Meghalaya, Tamil Nadu, Maharashtra, Punjab and Uttar Pradesh; furthermore, some of these (e.g. Kerala) are states that rank among the highest on the state Human Development Index but had failed to contain the burden of IDA. Although there is a standard guideline for IFA supplementation in place, the IFA intervention appears to be ineffective in reducing the burden of IDA in India (nationally only 30.3% of mothers consumed IFA for 100 days or more when they were pregnant), probably due to irregular consumption of IFA where the provision of screening under the National Iron+ Initiative scheme appears to be unsuccessful. To strengthen the IFA intervention and its uptake, a concerted effort of community-level health workers (accredited social health activists, auxiliary nurse midwives. and anganwadi workers) is urgently needed. In addition, food-based strategies dietary diversification and food fortification), food supplementation and improvement of health services are required to reduce the burden of anemia among women in India.

METHODOLOGY

The current research was used to assess the effectiveness of salubrious nutri mix on level of haemoglobin among pre-menopausal women residing in selected areas of rural community.

The researcher used a quantitative research approach in the present study. The research design that is chosen for this study is a quasi-experimental non-equivalent control group design. The population was pre-menopausal women residing in selected areas of rural community. The sample consisted of 60 pre-menopausal women residing in a selected area of the rural community. The sampling technique used was the non-probability purposive sampling technique. The setting was a selected area of rural community. Digital Haemoglobinometer was the tool to assess the level of haemoglobin among pre- menopausal women. The intervention given to the selected samples was a salubrious nutri mix. In this study, Salubrious nutri mix is a mixture of 5 food items (peanut powder 40 grams, jaggery powder 35 grams, chana dal powder 25 grams, sesame seeds 3 – 4 seeds and ½ tablespoon of ghee) to prepare 100-gram laddu. The content validity of the tool was done and was found to be 0.97. The study was done for 27 days. Salubrious nutri mix was administered to the experimental group of 30 pre-menopausal women and was not administered to the control group of 30 pre-menopausal women. The post-test was collected on the 27th day.

Steps of intervention

Definition: In this study, Salubrious nutri mix is a mixture of 5 food items (peanut powder, jaggery powder, chana dal powder, sesame seeds and a small amount of ghee) to prepare a laddu.

1 laddu contains 100 grams
Peanut powder = 40 grams
Jaggery powder = 35 grams
Chana Dal powder = 25 grams
Sesame seeds = 3 – 4 seeds
Ghee = ½ tablespoon Mix these 5 food items and prepare one laddu of 100 grams.

Steps:

1. Screening of pre-menopausal women will be done by Hb estimation with the digital haemoglobinometer.
2. The procedure will be explained to pre -menopausal women who are participating in the study.
3. For the procedure of Hb estimation written consent from participants.
4. The ring finger will be cleaned with an alcohol swab.
5. A prick will be given with the help of a lancet.
6. The blood will be taken from the ring finger on a Haemoglobinometer strip.
7. With the help of a digital Haemoglobinometer Hb will be estimated.
8. Pressure to be applied to the finger.
9. Recording of the Haemoglobin level will be done.
10. Categories of pre-menopausal women into mild, moderate, and severe will be done.
11. Selection of samples, pre-menopausal women with mild anemia will be selected
12. Administered Albendazole (400mg) on day 0
13. Administration of salubrious nutri mix to samples from day 1 to 26 under observation.
14. On the 27th day reassess the hemoglobin level of the study sample by using a digital haemoglobinometer and record it on the data sheet.
15. Data will be arranged into master sheet and calculated using descriptive & inferential statistics.
16. Pre and Post Hb levels will be compared.

Collected data will be analyzed with the help of paired t test.

Haemoglobin level scale according to WHO

GRADE	DESCRIPTION	RANGE (Hb in g/dl)
I	Mild	**9-11**
II	Moderate	**7-9**
III	Severe	**< 7**

-WHO

RESULT

Section I: Description of Sociodemographic data

1. AGE

Their age reveals that the highest percentage (53.33%) of respondents were in the age groups of 38-40 and 41-43 years. This was followed by the 44-45 years age group (26.66%), while the lowest percentage (20%) of respondents were in the 35-37 years age group. This indicates that a majority of respondents were concentrated in the 38-43 years age range, with relatively fewer in the youngest and oldest age groups.

2. RELIGION

Their religion reveals that the majority (70%) of respondents were Hindu. This was followed by 16.67% belonging to other religions, while 13.33% of respondents were Muslim. Notably, there were no respondents from the Christian community. This indicates that the sample had a predominant representation of Hindus, with a smaller proportion from other religious backgrounds.

3. DIET

Their dietary habits reveals that the majority (63.33%) of respondents were mixed. This was followed by 36.67% of respondents who were vegetarian. Notably, there were no respondents who only followed a non-vegetarian diet. This indicates that mixed habits were more prevalent among the respondents, with a smaller proportion following a vegetarian diet.

4. MONTHLY INCOME

Their monthly family income reveals that the majority (73.33%) of respondents had a monthly income of Rs. 30,000 and above. This was followed by 26.67% of respondents whose income ranged between Rs. 20,001 and Rs. 30,000. Notably, there were no respondents in the income categories of Rs. 10,000 and below or Rs. 10,001 – Rs. 20,000. This indicates that most respondents belonged to the higher income bracket, with no representation from the lower-income groups.

5. EDUCATION

Their educational qualification reveals that the highest percentage (38.33%) of respondents had completed graduation. This was followed by 23.33% of respondents with a diploma, 21.67% with secondary education, and 16.67% with primary education. Notably, there were no respondents with education beyond graduation. This indicates that the majority of respondents had attained at least a graduate-level education, with fewer individuals having lower educational qualifications.

6. OCCUPATION

Their occupation reveals that the highest percentage (40%) of respondents were homemakers. This was followed by 36.67% who were private employees, while 13.33% were government employees. Additionally, 10% of respondents were engaged in farming. Notably, there were no respondents who were self-employed. This indicates that the majority of respondents were either homemakers or employed in the private sector, with fewer engaged in farming or government jobs. \

section II

To assess the level of haemoglobin among pre-menopausal women residing in selected areas of rural community.

Fig no: 4.7

(N=60) (Experimental group-30 and Control group-30)

SN	Hemoglobin level	Experimental group		Control group	
		F	%	F	%
1	09-11 (Mild)	30	100	30	100
2	07-09 (Moderate)	00	00	00	00

3	< 7 (Severe)	00	00	00	00

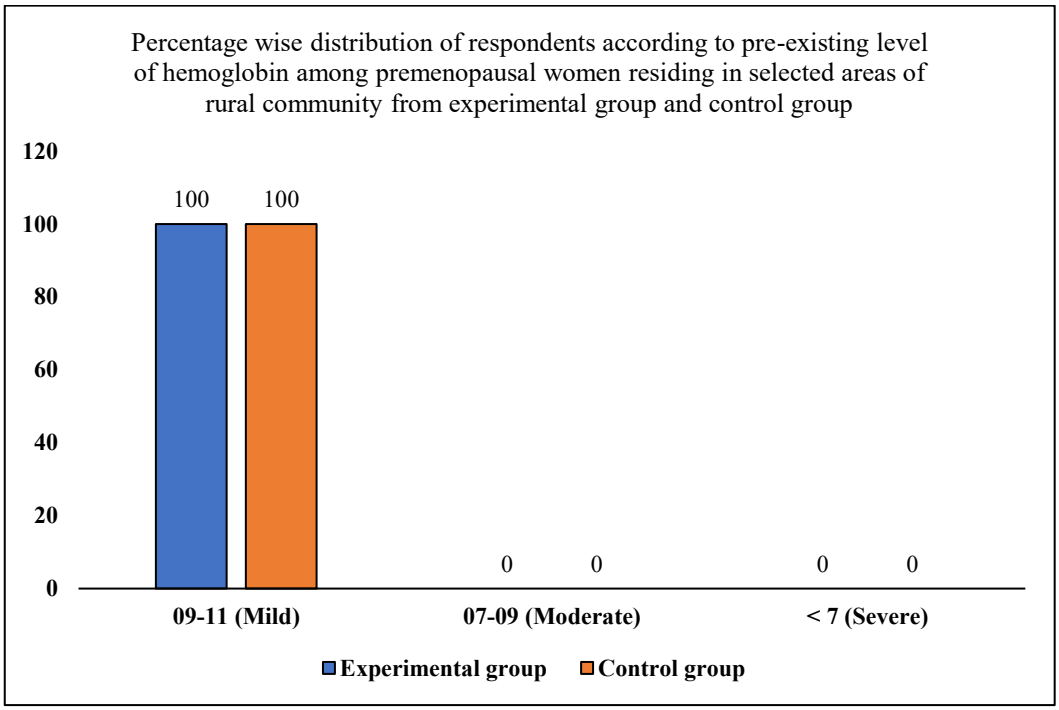

Fig no: 4.7

Bar diagram showing percentage wise distribution of respondents according to pre-existing level of hemoglobin among premenopausal women residing in selected areas of rural community from experimental group and control group

The percentage-wise distribution of respondents according to their pre-existing level of haemoglobin reveals the following patterns in the experimental and control groups:

1. A "Mild" level of haemoglobin (9–11 g/dL) was observed in 100% (30 respondents) of the experimental group and 100% (30 respondents) of the control group.
2. A "Moderate" level of haemoglobin (7–9 g/dL) was reported by 0% (0 respondents) in both the experimental and control groups.
3. A "Severe" level of haemoglobin (<7 g/dL) was identified in 0% (0 respondents) in both the experimental and control groups.

This indicates that both the experimental and control groups shared similar distributions, with all respondents in both groups falling into the "Mild" level of haemoglobin. There were no respondents in either group with moderate or severe levels of haemoglobin.

Section III

To assess the pre-test and post-test levels of haemoglobin among pre-menopausal women residing in selected areas of rural community from experimental group and control group

Table No: 4.8

Distribution of respondents according to pre-test and post-test level of haemoglobin among pre-menopausal women residing in selected areas of rural community from experimental group. (N=30)

SN	Hemoglobin level	Pre-test		Post-test	
		F	%	F	%

1	12-14 (Normal)	00	00	10	33.33
2	09-11 (Mild)	30	100	20	66.67
3	07-09 (Moderate)	00	00	00	00
4	< 7 (Severe)	00	00	00	00

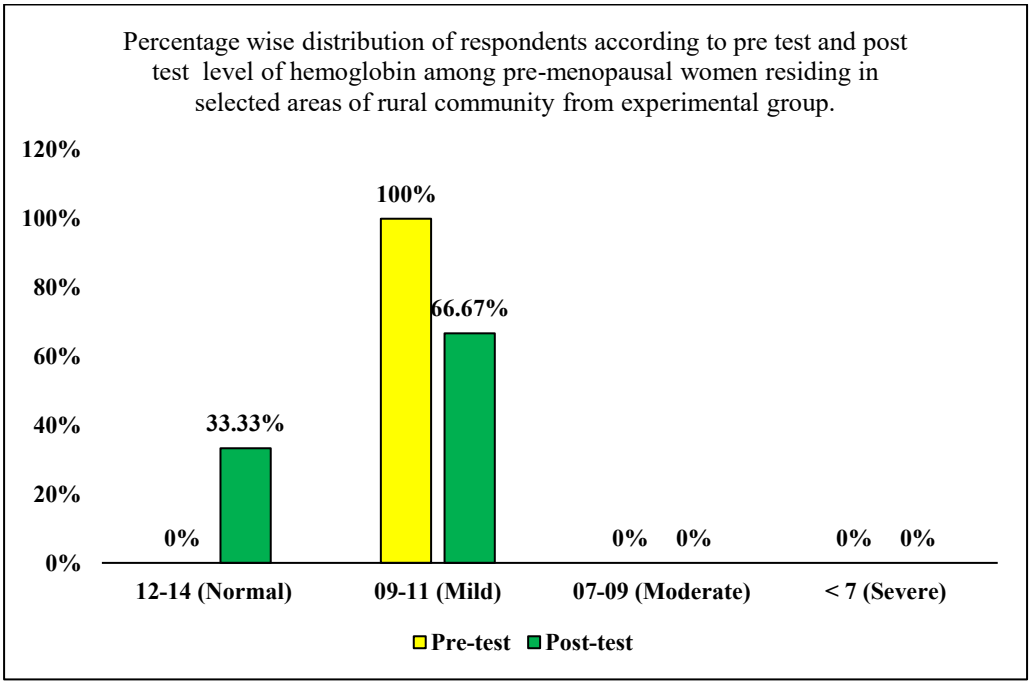

Fig no: 4.8

Distribution of respondents according to pre-test and post-test level of haemoglobin among pre-menopausal women residing in selected area of rural community from experimental group

The percentage-wise distribution of respondents according to their haemoglobin levels reveals that before the intervention (pre-test), all (100%) respondents had mild anemia (9-11 g/dL), with no respondents in the normal, moderate, or severe anemia categories. However, after the intervention (post-test), 33.33% of respondents had moved to the normal hemoglobin range (12-14 g/dL), while 66.67% remained in the mild anemia category. Notably, there were no cases of moderate or severe anemia in either the pre-test or post-test. This indicates a positive impact of the intervention, as a significant portion of respondents improved their hemoglobin levels to the normal range.

Table No: 4.9

Distribution of respondents according to pre-test and post-test level of hemoglobin among premenopausal women residing in selected areas of rural community from control group. (N=30)

SN	Hemoglobin level	Pre-test		Post-test	
		F	%	F	%

1	12-14 (Normal)	00	00	00	00
2	09-11 (Mild)	30	100	30	100
3	07-09 (Moderate)	00	00	00	00
4	< 7 (Severe)	00	00	00	00

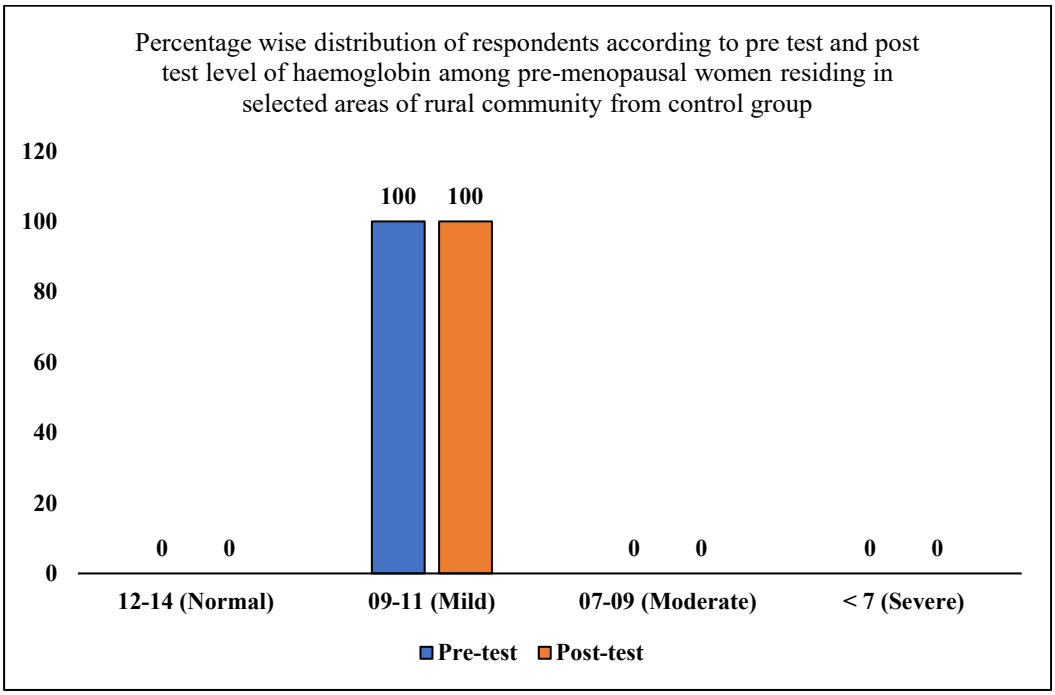

Fig no: 4.9

Distribution of respondents according to pre-test and post-test level of haemoglobin among pre-menopausal women residing in selected areas of rural community from control group.

The percentage-wise distribution of respondents in the control group according to their hemoglobin levels reveals that in both the pre-test and post-test, all (100%) respondents had mild anemia (9-11 g/dL). No respondents were in the normal (12-14 g/dL), moderate (7-9 g/dL), or severe (<7 g/dL) anemia categories at any stage of the study. This indicates that there was no improvement in hemoglobin levels among the respondents in the control group, suggesting the absence of any significant change in their anemia status over time.

Section III

To determine the effectiveness of salubrious nutri mix on level of haemoglobin among pre – menopausal women residing in selected areas of rural community.

Table No: 4.10

Paired 't' value of pre and post-test level of haemoglobin among pre – menopausal women residing in selected areas of rural community in experimental group. **(N=30)**

SN	Group	Mean	SD	't' value	P Value

1	Pre-test	10.33	0.55	**13.97**	**0.001**
2	Post-test	11.46	0.59		

DF=29, table value = 2.045 at p = ≤0.05

The **paired t-test** was conducted to compare the pre-test and post-test levels of haemoglobin among pre-menopausal women in the experimental group after the administration of the intervention.
The results indicate that the mean pre-test haemoglobin level was 10.33 g/dL (SD = 0.55), whereas the mean post-test haemoglobin level was 11.46 g/dL (SD = 0.59). The calculated t-value is 13.97, which is significantly higher than the table value (2.045 at $p \leq 0.05$, DF = 29).
The p-value (0.001) is less than 0.05, indicating a statistically significant improvement in haemoglobin levels after the intervention. This suggests that the intervention was effective in increasing haemoglobin levels among pre-menopausal women in the experimental group.

Table No: 4.11

Paired 't' value of pre and post-test level of haemoglobin among pre – menopausal women residing in selected areas of rural community from control group. **(N=30)**

SN	Group	Mean	SD	't' value	P Value
1	Pre-test	10.26	0.51	**0.54**	**0.591**
2	Post-test	10.22	0.53		

DF=29, table value = 2.045 at p = ≤0.05

The paired t-test was conducted to compare the pre-test and post-test levels of haemoglobin among pre-menopausal women in the control group.
The results indicate that the mean pre-test haemoglobin level was 10.26 g/dL (SD = 0.51), whereas the mean post-test haemoglobin level was 10.22 g/dL (SD = 0.53). The calculated t-value is -0.54, which is lower than the table value (2.045 at $p \leq 0.05$, DF = 29).
The p-value (0.591**)** is greater than 0.05, indicating that there is no statistically significant difference between pre-test and post-test haemoglobin levels in the control group. This suggests that there was no significant change in haemoglobin levels among pre-menopausal women who did not receive the intervention.

Table No: 4.12

Un paired 't' value of post-test level of haemoglobin among pre – menopausal women residing in selected areas of rural community from experimental and control group. **(N=60)**

SN	Group	Mean	SD	't' value	P Value
1	Experimental group	11.46	0.59	**8.56**	**0.001**
2	Control group	10.22	0.53		

DF=58, table value = 2.001 at p = ≤0.05

The unpaired t-test was conducted to compare the post-test haemoglobin levels between pre-menopausal women in the experimental group and the control group.
The results indicate that the mean post-test haemoglobin level was 11.46 g/dL (SD = 0.59) in the experimental group and 10.22 g/dL (SD = 0.53) in the control group. The calculated t-value is 8.56, which is higher than the table value (2.001 at $p \leq 0.05$, DF = 58).
The p-value (0.001) is less than 0.05, indicating a statistically significant difference between the post-test haemoglobin levels of the experimental and control groups. This suggests that the intervention had a significant positive effect on improving haemoglobin levels among pre-menopausal women in the experimental group.

Section IV

To find out the association between study findings with selected demographic variables.

Table No: 4.13

Association of Pre-Test Level of Haemoglobin with Selected Demographic Variables Using Chi-Square Test

SN	Variable	Chi-Square (χ^2) Value	p-Value	Significance ($p > 0.05$)	Table χ^2 Value (df, $\alpha = 0.05$)
1	Age	3.20	0.362	Not Significant	7.82 (df = 3)
2	Religion	4.80	0.186	Not Significant	7.82 (df = 3)
3	**Type of Diet**	**6.45**	**0.040**	**Significant**	**3.84 (df = 1)**
4	Monthly Income of the Family	2.90	0.408	Not Significant	3.84 (df = 1)
5	**Education**	**8.72**	**0.033**	**Significant**	**9.49 (df = 4)**
6	Occupation	5.67	0.129	Not Significant	9.49 (df = 4)

Interpretation:

The chi-square test results suggest that type of diet and education show a significant association with haemoglobin levels ($p < 0.05$). However, age, religion, monthly income, and occupation do not show a significant association with haemoglobin levels ($p > 0.05$).

DISCUSSION

The discussion concludes the research report. A thoughtful discussion section clarifies the meaning of the research findings. The most crucial component of every study report is this one. The results of the current study have been described in relation to the research problem's aim, and the researcher has also discussed the study's findings in relation to the outcome objective. The present study was conducted to assess the effectiveness of salubrious nutri mix on level of haemoglobin among pre-menopausal women residing in selected areas of rural community. A review of literature was done and sample size, study design, etc. were determined. The study approach used was the quantitative approach, the study design used was non-equivalent control group design. The population included was pre-menopausal women and the accessible population included pre-menopausal women residing in selected areas of rural community. A total of 60 samples were selected using the non-probability purposive sampling technique; 30 samples were placed in the control group and 30 samples were placed in the experimental group. The tool was selected for the collection of data. A Digital Hemoglobinometer was used to assess the level of haemoglobin. Validity of the tool was performed by experts and reliability was done. The tool was found to be valid and reliable. Calibration of digital Hemoglobinometer was done. Ethical permission was taken from the ethical committee. A pilot study was done on 10 samples. Analysis of the pilot study depicted that the research was feasible to perform. Before the main data collection consent was taken from the participants by explaining the purpose of the research and assurance of confidentiality was given to them. A pretest was done for both the experimental and control groups. Samples were selected who fit in criteria. On the day 0 Deworming was done. On day 1 salubrious nutri intervention was given to the experimental group. On the 27th day posttest was done for both the experimental and control group.

OTHER STUDIES REFER TO

1. A pre-experimental one group pretest / post-test study was conducted among teenage girls aged 13-15 years with mild to moderate anemia to evaluate the efficacy of a nutritional ball composed of Arachis hypogaea (groundnut), Sesamum indicum, Eleusine coracana, and Saccharum officinarum, along with daily amla consumption, over 60 days. Hemoglobin levels were measured using Sahli's hemoglobinometer. There was a significant increase in mean hemoglobin from 11.03 g/dL to 11.35 g/dL (A = 0.32 g/dL; paired t-test t = 9.261, $p < 0.05$). Improvements in hemoglobin were significantly associated with sociodemographic factors such as family income, family type, and maternal education. The study concludes that this traditional, food-based intervention effectively raises hemoglobin levels in adolescent girls with anemia.

2. Iron deficiency anemia is highly prevalent among adolescent females. Objectives: To assess the effect of consuming finger millet (ragi) Ladoo on hemoglobin levels. quasi-experimental study was performed in a ladies' hostel of a selected college in Bhubaneswar, Odisha, involving 120 nutritionally anemic young women (aged 17-19 years). Participants were divided into experimental (n = 60) and control (n = 60) groups. After deworming, the experimental group received two 50 g ragi ladoos daily for four weeks. Hemoglobin was measured using Sahli's hemoglobinometer before and after the intervention. Results stated that in the experimental group, the mean baseline hemoglobin was 8.9 ± 0.64 g/dL, which increased to 9.04 ± 0.65 g/dL post-intervention. The increase was statistically significant (t = 16; p = 0.0001). Conclusion Daily consumption of ragi Ladoo over four weeks produced a modest but statistically significant improvement in hemoglobin levels among moderately anemic adolescent

CONCLUSION

The study came to the conclusion that salubrious nutri mix intervention improved haemoglobin levels in pre – menopausal women. Thus, it is effective on the level of haemoglobin among pre- menopausal women residing in selected area of rural community.

ACKNOWLEDGEMENT -

"Trust the Lord with all your heart lean on your understanding: in all your ways Acknowledge Him, and He will make your path straight." (Proverb 3:5, 6)
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.

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Conflict of interest – There are no conflict of interest**.**

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