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Effect of Multigrain Soya Panjiri Supplementation on Quetelet Index and Anaemia Profile of Malnourished Women of Chhattisgarh

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Abstract: ***In this study effect of soya multigrain panjiri supplementation was observed on quetelet index and anaemia profile of malnourished women of chhattisgarh. This study was conducted on 100 malnourished women of chhattisgarh. The criteria for selection of malnourished women was haemoglobin level of <12 g/dl. In this one group pre-post test design quetelet index i.e. Body mass index was assessed with the help of usual anthropometric parameters while cyanmethaemoglobin method was used for estimation of haemoglobin. The data was again collected after supplementation of soya multigrain panjiri for three months. The result indicates considerable increase in anaemia profile and nutritional status as assessed by bmi among malnourished women. It was concluded that multigrain soya panjiri is a useful supplement for enhancing anaemia profile and nutritional status of malnourished women.***

Keywords: Soya multigrain panjiri, malnourished women, Quetelet Index

I. INTRODUCTION

Human development is dependent on nutrition that is why investment in nutrition has been advocated globally. Good nutrition provides base for controlling poverty as well as enhanced economical development. Nutritional deficiencies are associated with frequent infection and reduced productivity.

According to Global Nutrition Report 2017 presented at Milan in Italy under nutrition in India is of serious concern especially when half of women of reproductive age in India are suffering from anaemia. This Global Nutrition Report 2017 reported that more than 51 percent women of reproductive age in India are suffering from anaemia while 22 percent are obese. [Globalnutritionreport.org]

The 2005 Global Burden of Disease has ranked anaemia as major cause of loss of productivity in India. The reason being that iron deficient anaemia reduces work capacity which automatically affects economic development of a nation. It has even greater consequences in women of reproductive age because they give give birth to a weak child. Situation is no different in Chhattisgarh. According to reports of National Vector Borne Disease Control Programme about 41.0% women were underweight while 57.6 percent women of reproductive age were anaemic. Body mass index or Quetelet Index is generally considered as an index of fitness. It is a useful method to evaluate health status of person. An adult Person with BMI of 18.5 or lower is considered to be underweight. Body mass index and other related data such as anaemia then are used to assess malnutrition. Malnourishment can be explained as lack of nourishment either by insufficient food intake or some medical condition. When metabolism of body is responsible then malnutrition is disease related. Mainly all over the world malnutrition is due to poverty. In other words malnutrition is the result of eating disorder, unbalanced diet that did not have enough nutrients. The term malnutrition generally means nutritional deficiency which includes under nutrition as well micronutrient deficiencies though it actually refers to nutritional excess. Body Mass Index (BMI or the ratio of weight-for-height) of a sizeable proportion of women i.e. 23% and men 20% in the age group 15-49 is found to be falling below the norm.[NFHS – 4. 2015-16] In Chhattisgarh 26.7% women and 24.1 men were under nourished while 11.9% and 10.2% women and men were overweight. To address the issue of malnutrition cost effective supplementation of macro and micronutrients are advocated. The supplement in the form of soya multigrain panjiri may be suitable also because of its nutritional properties. In general terms loaf containing several types of grains is called multigrain. This distinguishes whole grain breads from multigrain. Multigrain can include oats, wheat, millet, flex etc. and there is no collective list of grain which is used to prepare multigrain. In a sense product with two or more grains may be classified as multigrain. The process of preparation is not applicable as far as product classified ad multigrain are concerned. Panjiri is a traditional seasonal staple from Punjab region used as nutritional supplement. Soybean is a miracle bean and it contains about 43.2 percent good quality protein with minimum saturated fat along with 21 percent carbohydrate (Gopalan et al., 1999). Soybean is also a good source of minerals and vitamins.

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II. REVIEW OF LITERATURE

So many researchers namely Haque and Rashid (2009), Dey et al. (2010), Yadav et al. (2011), Maiti et al. (2013), Sanap, Yogita and Jadhav Kalpana (2014), Agarwal and Vani Sethi (2013), Gurwara Nanda and Reena Barai (2016), Bhandari et al. (2016) carried out extensive work on malnutrition and anaemia in women along with benefits of various supplementation on nutritional status of malnourished women. Surprisingly the impact of supplementation of soyamultigrain pangiri for a duration of three months has not been observed on Quetelet Index and anaemia profile of malnourished women.

III. OBJECTIVES

The main objective of the present study is to assess the efficacy of soya multigrain panjiri on Quetelet Index and anaemia profile of malnourished women.

IV. MATERIALS AND METHODS

A. *Sample*

The population for the present study females of 18-24 years of age from government general nursing training centre and government nursing college located in Raipur city. 100 anaemic women between 18-24 years of age were selected as sample. Only those subjects with haemoglobin level <12 g/dl were selected as sample. Purposive sampling was used for selection of subjects.

B. *Tools*

1) *Body Mass Index:* Height was measured using anthropometer while beam balance was used to measure weight of selected subjects.

Body Mass Index was calculated with the help of following formula (Eknoyan, 2007).

$$BMI = \frac{\text{Body Weight (kg)}}{\text{Height (m}^2\text{)}}$$

The most commonly used definitions by WHO in 1997 and published in 2000 classify BMI into following categories:

Grading	BMI
Underweight	<18.5
Normal	18.5-25
Overweight	25-29.9
Obesity	>30

2) *Estimation of Haemoglobin:* Cyanmethaemoglobin method was used for estimation of haemoglobin (Cook, 1985). It uses Drabkin's cyanide-ferricyanide solution. The solution is made up of potassium cyanide (50mg), potassium ferricyanide (200mg), distilled water (1 litre). This solution was kept in brown bottle under cold storage. Haemoglobin cyanide and ferricyanide were converted to cyanmet haemoglobin. The absorbance of solution was measured in photoelectric colorimeter at a wavelength of 540nm.

3) *Procedure:* 0.2 ml of blood was transferred with the help of pipette into a test tube containing 5ml of Drabkin's solution. The contents of the tubes were mixed and reading was taken in a photoelectric colorimeter using 540nm. Haemoglobin level was recorded in gm/dl.

C. *WHO classification of anaemia*

CLASSIFICATION	RANGE (g/dl)
Mild	10.0-11.9
Moderate	8.0-9.9
Severe	<7.9
Normal	12& above

D. *Design*

The one group pretest-post test design was preferred to conduct the study.

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V. METHOD AND PROCEDURE

A. First of all 100 malnourished women were selected out of screened subjects as per their anaemia profile

B. Multigrain panjiri was prepared wheat flour 10gm; soya flour 20gm, black till 10gm, ragi 10gm, Jaggery 20gm and ghee 5gm. The proportion of wheat flour, soya flour was kept at the ratio of 1:2 It is standard practice to apply controlled heat to the soya flour which inactivates the antinutritional factors. Daily 75gm was provided to each subject conditioned to consume it on that particular day.

C. The supplementation period was of three months

D. The data was collected twice as per the requirement of pre-post research design. The results are presented in table 1 and 2 respectively.

VI. RESULT AND DISCUSSION

The pre-post frequency distribution on the basis of WHO classification of Quetelet Index is shown table no. 1.

Table No. 1
Pre-Post Test Frequency Distribution of Selected Malnourished Anaemic
Women on the Basis of Quetelet Index (BMI)

BMI	Pre Test (N=100)		Post Test (N=100)	
	Frequency	%	Frequency	%
Under weight (<18.5 kg/m^2)	40	40.0	10	10.0
Normal (18.5-25.0 kg/m^2)	60	60.0	90	90.0
Total	100	100.0	100.0	100.0

Pre test frequency distribution showing 40% subjects in under-weight category while 60% subjects had normal BMI. The post test frequency distribution showing 10% subjects in underweight category while 90% came under normal BMI category. It shows that malnutrition in anaemic women was reduced after supplementation of three months of soya multigrain panjiri.

Table No. 2
Pre-Post Test Frequency Distribution of Selected Malnourished Women
on the Basis of their Anaemia Profile

Grades of Anaemia	Pre Test (N=100)		Post Test (N=100)	
	Frequency	%	Frequency	%
Severe (Hb<7.9 g/dl)	02	2.0	-	-
Moderate (Hb 8-9.9 g/dl)	17	17.0	02	2.0
Mild (Hb 10-11.9 g/dl)	81	81.0	20	20.0
Normal (Hb >12 g/dl)	-		78	78.0
Total	100	100.0	100	100.0

The pre test statistics depicted in table 2 showing that 2% subjects had severe anaemia, 17% classified as moderately anaemic while 81% were mildly anaemic. The post test frequency distribution shows that none of the subjects had severe anaemia while 2% and 20% came under the category of moderate and mild anaemic. The post test frequency distribution reveals that 78% women subjects had normal haemoglobin levels.

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Results clearly indicate that 03 months supplementation of soya multigrain panjiri results in enhanced anaemia profile and nutritional status as assessed by Quetelet Index in malnourished women.

In the present study multigrain panjiri was prepared by wheat flour 10gm; soya flour 20gm, black till 10gm, ragi 10gm, Jaggery 20gm and ghee 5gm respectively. Soybeans are very rich in nutritive components. Besides the very high protein content, soybeans contains a lot of fibre and are rich in calcium, magnesium and iron. The soy protein has a high biological value and contains all the essential amino acids. [USDA National Nutrient Database for Standard Reference, Nutrition value.org, 2018.] According to American Journal of Clinical Research, wheat flour is rich in catalytic elements, minerals such as calcium, magnesium, potassium, sulphur, chlorine, arsenic, silicon, manganese, zinc, iodide, copper, vitamin B, and vitamin E respectively. Due to this reason it is the foundation of nourishments. Chemical composition of sesame includes 50-60% of oil, 18-25% of protein, 13.5% of carbohydrate and rest i.e. 5% ash. (Elleuch et al., 2007) It is good source of folate. Ragi is superior to rice and wheat in certain constituent of calcium. This finger millet protein has well balanced amino acid profile and is a good source of methionine, cystine and glycine and contributes vitamins like thiamine, riboflavin, foline and niacin. Soya flour was chosen for incorporation as it is less expensive yet rich in calories, protein, fats, vitamins and minerals. Soya contains 45 percent of protein of high biological value. Jaggery contain all the vitamins. It is rich in important minerals Calcium, Magnesium, Potassium, Phosphorus, Sodium, Iron, Manganese, Zinc, Copper, vitamins and along with rich source of protein which can be made available to the masses to mitigate the problems of malnutrition and under nutrition (Sahu et al., 1998). Hence the results are not surprising.

VII. CONCLUSION

On the basis of results it may be concluded that soya multigrain panjiri is a useful supplement for enhancing anaemia profile and nutritional status of malnourished women.

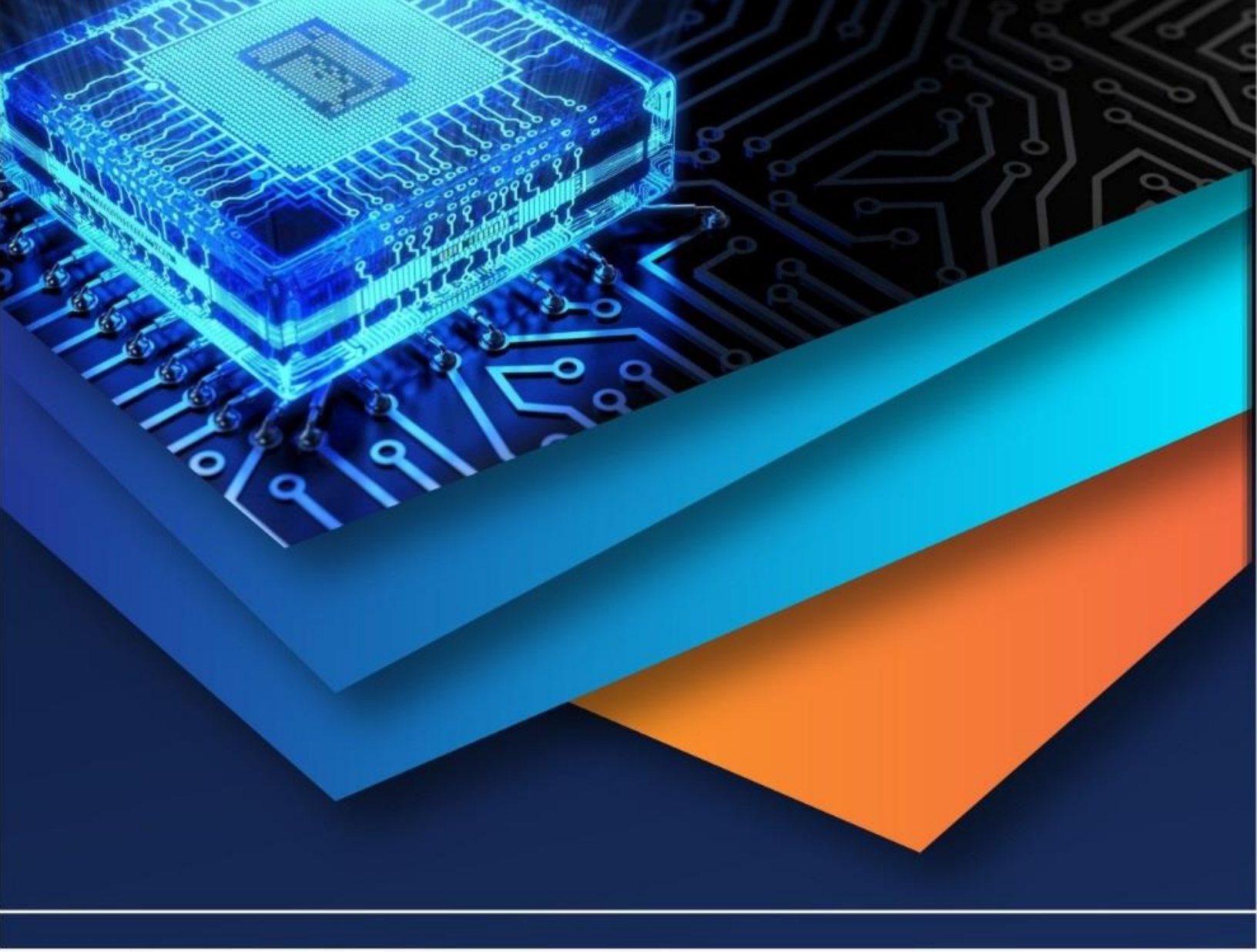
VIII. RECOMMENDATIONS

On the basis of results it is recommended that judicious use of soya multigrain panjiri may help not only to reduce anaemia in women but also enhance their nutritional status.

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