

AN EMPIRICAL STUDY OF DIETARY PATTERN AND NUTRITIONAL INTAKE OF PREGNANT WOMEN OF SHIMOGA DISTRICT

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Abstract

Pregnancy could be a high-flying event during a woman's life, ready to convert her life forever. During pregnancy, a woman's body undergoes significant changes to bring a new life into the world. Pregnant women need to make lifestyle choices that positively impact their wellbeing and reduce the risks of any complications. Nutritional status of pregnant women is very crucial to the wellbeing of the unborn child. Good dietary pattern among pregnant women reduces the rate of maternal and infant mortality. Pregnancy creates extra demands for certain nutrients, including iron, calcium, iodine and many vitamins. The consumption of a beneficial dietary pattern before and during pregnancy is associated with a reduced risk of disorders of pregnancy, including gestational diabetes mellitus (GDM), preterm birth, obesity-related complications, and, in some populations, preeclampsia and gestational hypertension. Nutrition education and counselling is a widely used strategy to improve the nutritional status of women during pregnancy.

There are several social welfare schemes of state and central government for pregnant women. The government schemes provide several benefits for pregnant women's such as cash benefits, medical benefits, take home ration benefits, creating awareness about dietary pattern and nutritional intake of pregnant women and so on. The study is empirical in nature and covers the area of Shimoga district in Karnataka, restricted to 4 talukas that is Sagar, Thirthahalli, Shikaripura and Hosanagara.

Keywords: Dietary Practices, Nutritional Diet, Nutritional Practices, Pregnant Women (rural), Scheme Awareness

Introduction

Childbirth is a very important event in women's life. But complications during pregnancy and childbirth are a leading cause of death and disability among women of reproductive age in developing countries. Nutritionally balanced nutrition assessment, mothers' nutrition motivation, and healthy nutrition information are among the factors that affect infants. Thus, it is possible to shed light on the attempts to reach information in healthy nutrition guides among pregnant women. The physiological stress of pregnancy demands that nutrient and energy intake is adequate, not only for the woman's health, but in order that the fetus may develop optimally. A healthy, balanced diet during pregnancy is essential to support optimal growth and development of the fetus and the physiological changes that occur in the mother. Fundamental aspects of healthy dietary behaviors during pregnancy include consuming foods

that contain optimal amounts of energy as well as macro and micronutrients, achieving appropriate weight gain, adhering to general and pregnancy-specific food safety recommendations, and avoiding ingestion of harmful substances. Insufficient folic acid and iodine intake cause preventable birth defects and fetal cognitive problems. Low quality of maternal diet increases the risk of premature birth. Poor maternal nutrition in pregnancy, impaired glucose tolerance, and dyslipidemia may cause increased systemic arterial pressure. Fetus exposure to maternal obesity, diabetes, and systemic hypertension may increase the risk of developing obesity and chronic diseases in later ages. Knowledge of the benefits of some basic nutrients such as omega 3 fatty acids and nutrient sources, and deficiencies of nutrients and vitamins and mineral (e.g. iodine, iron) in pregnant women needs to be increased. The level of relationship between the knowledge and awareness level of pregnant women and their compliance with dietary rules should be determined. Thus, it is possible to shed light on the attempts to reach information in healthy nutrition guides among pregnant women and to improve the nutrition quality in their daily lives. In order to support the safe, healthy, and balanced nutrition of women during pregnancy, it is important to have an idea about factors that affect their dietary behaviors.

Pregnancy month	What to eat
Month 1	Leafy vegetables, fortified whole grains, avocado, sweet potato, chicken
Month 2	Salmon, cooked eggs, sunflower seeds, raw almonds
Month 3	Fortified milk, orange juice, fiber
Month 4	Cooked eggs, free-range meats, leafy greens, chickpeas, tofu, beans
Month 5	Milk, cheese, yogurt, broccoli, oranges, tomatoes
Month 6	Fruits, vegetables, whole grains, avocados
Month 7	Meat, fish, poultry, canned light tuna, Brazil nuts, whole-grain breads
Month 8	Salmon, shrimp, pollock, sour cherries, fruits, vegetables, whole grains
Month 9	Water, cranberries

Source: <https://www.similac.com/pregnancy/diet-plan.html>

The Indian government has introduced some maternity benefit schemes. The utilization of schemes depends on the awareness among the beneficiaries. The government is doing at its best level but it must take the role of a facilitator role. Government should take the help by promoting cooperative bodies, Self Help Groups and other workforce allotted by the government for each angawadi, Gram panchayath and the government offices who are present in each village to create awareness on the significance of various type of nutrients in the dietary practices of the pregnant women. There are 62,580 Anganwadi centers in Karnataka, in that, in shimoga district there are 2,460 Anganwadi centers who are serving the pregnant women. Anganwadi workers mainly involve in providing take home rations provided under the government schemes and also creating awareness about dietary pattern and nutritional intake among pregnant women's.

Objectives of the Study

- (i) To understand the significance of proper nutritional intake by pregnant women (rural) and its impact on child growth.
- (ii) To examine the nutritional intake and dietary practices among pregnant women (rural)
- (iii) To analyse the level of awareness about the nutrients and nutritional intake among the pregnant women (rural) based on the food habits.
- (iv) To examine the effectiveness of the social welfare schemes of State and Central Government for pregnant women (rural)

Methodology of the Study

I. Type and Sources of Data: The study is empirical in nature, wherein both primary and secondary data have been collected for critical examination of dietary practices, the nutritional intake and also about the awareness of the respondents on the social welfare schemes extended by both the State and Central and Central Government to the pregnant women of marginal and rural women of Sagara Taluk, Soraba Taluk, Hosanagara Taluk and Thirthalli Taluk of Shimoga District.

Data Collection and Sampling Procedures: the primary data for the study have been collected through structured questionnaire. The total of 111 sample respondents (rural women who are in different stages of pregnancy) were considered for the study purposes through purposive and judgemental sampling techniques.

II. Tools of Analysis: both descriptive statistical techniques (viz. data representation techniques, mean, standard deviation, and variances) and inferential statistical techniques (viz. Chi-square test and One-way ANOVA) were used for empirical analysis of primary data collected through structured questionnaire

Data Analysis and Interpretation

□ Profile of the Respondents

Profile	Frequency	Percent	
Age of the Respondent	19 years to 25 years	60	54.1
	26 years to 31 years	45	40.5
	32 years to 37 years	3	2.7
	38 years and above	3	2.7
Type of family	Nuclear family	75	67.6
	Joint family	36	32.4
	10000 and below	3	2.7
	10001 to 20000	30	27
	20001 to 30000	36	32.4

Average monthly household income	30001 to 40000	33	29.7
	40001 and above	9	8.1
Food Habit	vegetarian	63	56.8
	Non-vegetarian	48	43.2
Total		111	100

Source: Primary Data

- Of total 111 respondents 54.1% respondents belongs to the age group of 19-25 years, 40.5% respondents belongs to the age group of 26-31, 2.7% respondents belongs to the age group of 32-37 years and belongs to the age group of 38 years and above. Further, It can be observed that majority of the respondents belongs to the age group of 19 years to 25 years.
- 67.6% respondents belongs to nuclear family and 32.4% of the respondents belongs to joint family. Thus it can be understood that, majority of the respondents belongs to the nuclear family.
- 32.4 % respondents have the average monthly household income of Rs.20001 to Rs.30000, 29.7% respondents have Rs.30001 to Rs.40000, and 27% of the respondents have an average monthly household income of Rs.10001 to Rs.20000.
- 56.8% respondents are vegetarian, and 43.2% of the respondents are non-vegetarian

□ **Education profile of the respondent and understanding about the concept of nutritional intake**

Education and perception about the concept of nutrition	Eating good food	adequate consumption of all classes of food	Eating plenty food	eating anything i like	Total
Secondary school	0	9	0	0	9
Higher secondary school	5	10	3	0	18
Graduate	31	20	0	0	51
Post graduate	18	3	0	6	27
Other	3	3	0	0	6
Total	57	45	3	6	111
Value	df	Asymp. Sig. (2-sided)			
57.628	12	0.001			

Source: Primary Data

At 5 percent level of significance and 12 degrees of freedom (two-tailed test), there exists a significant association between education profile of the respondent and their understanding about the concept of nutritional intake. Therefore it can be concluded that; **the understanding and their opinion on the concept of nutrition differ based on the education of the pregnant women accordingly.**

- **Food habit, dietary pattern and nutritional intake among pregnant women**
1. **CEREALS - DIETARY PATTERN AND NUTRITIONAL INTAKE**

Cereals are fortified with key nutrients, such as folic acid, iron, zinc, calcium, and vitamins A, C, and D, all of which are linked to successful placental and fetal development. Cereals are a great way to include milk in your diet. There are a lot of women who do not usually drink milk. So, cereals are a great way out for these women to have milk on a regular basis. Whole grain cereals are rich in fiber and other minerals and vitamins.

A) DIETARY PATTERN

Dietary Pattern		Vegetarian	Non-vegetarian	Total
Very high		33.30%	14.30%	24.30%
High		14.30%	42.90%	29.70%
Moderate		52.40%	42.90%	45.90%
Total		100.00%	100.00%	100.00%
Value	Df.	Asymp. Sig.		
26.168 ^a	4	.001		

Source: Primary Data

Cereals intake is approximately equal irrespective of the food habits of the pregnant women which is evident through the application of chi-square test. At 5 percent level of significance and 4 degrees of freedom (two-tailed test), there exists a significant association between food habit and cereals intake in diet.

B) NUTRITIONAL INTAKE

Nutritional intake of Cereals		Vegetarian	Non-vegetarian	Total
Daily	Count	23	27	50
	% within	36.5%	55.3%	45.0%
4-6 times / week	Count	16	9	25
	% within	25.4%	19.1%	22.5%
2-4 times/ week	Count	24	9	33
	% within	38.1%	19.1%	29.7%
Occasionally	Count	0	3	3
	% within	0.0%	6.4%	2.7%
Total	Count	63	48	111
	% within	100.0%	100.0%	100.0%
Value	Df.	Asymp. Sig. (2-sided)		
11.12	6	0.085		

Source: Primary Data

The dietary and nutrient intake pattern of the respondents do not vary significantly between vegetarians and non-vegetarians, with regarding to “cereals”. 45 percent of respondents consume cereals daily.

2. PULSES - DIETARY PATTERN AND NUTRITIONAL INTAKE

Increased consumption of dietary pulses, specifically beans, could be a means to improve

nutrient intake during pregnancy as they are high in protein, fiber, complex carbohydrates, folate, zinc, iron, and magnesium with low saturated and total fat.

A) DIETARY PATTERN

Dietary Pattern		Vegetarian	Non-vegetarian	Total
Very high		9.50%	59.50%	11.70%
High		49.20%	97.60%	48.60%
Moderate		41.30%	42.90%	39.60%
Total		100.00%	100.00%	100.00%
Value	Df.	Asymp. Sig.		
10.485	4	.033		

Source: Primary Data

Pulses intake is approximately equal irrespective of the food habits of the pregnant women which is evident through the application of chi-square test. At 5 percent level of significance and 4 degrees of freedom (two-tailed test), there exists a significant association between food habit and pulses intake in diet.

B) NUTRITIONAL INTAKE

Nutritional intake of Pulses		Vegetarian	Non-vegetarian	Total
Daily	Count	21	12	33
	% within	33.3%	25.5%	29.7%
4-6 times / week	Count	22	21	43
	% within	34.9%	42.6%	38.7%
2-4 times/ week	Count	17	12	29
	% within	27.0%	25.5%	26.1%
1-2 times /week	Count	3	3	6
	% within	4.8%	6.4%	5.4%
Total	Count	63	48	111
	% within	100.0%	100.0%	100.0%
Value	Df.	Asymp. Sig. (2-sided)		
2.704	6	0.845		

Source: Primary Data

The dietary and nutrient intake pattern of the respondents do not vary significantly between vegetarians and non-vegetarians, with regarding to “pulses”. 39 percent of respondents consume pulses four to six days in a week.

3. MILK AND MILK PRODUCTS - DIETARY PATTERN AND NUTRITIONAL INTAKE

Among the food and beverage groups, milk and dairy products are most effective for promoting fetal growth and neonatal birth size because they contain various nutrients such as

protein, calcium, phosphorus, potassium, iodine, vitamin B12, and riboflavin, among others

A] DIETARY PATTERN

Dietary Pattern		Vegetarian	Non-vegetarian	Total
Very high		30.20%	64.30%	25.20%
High		20.60%	28.60%	22.50%
Moderate		49.20%	57.10%	49.50%
Low		0%	50.00%	2.70%
Total		100.00%	100.00%	100.00%
Value	Df.	Asymp. Sig.		
62.157 ^a	6	.000		

Source: Primary Data

Milk/milk products intake is approximately equal irrespective of the food habits of the pregnant women which is evident through the application of chi-square test. At 5 percent level of significance and 4 degrees of freedom (two-tailed test), there exists a significant association between food habit and milk and milk products intake in diet.

B] NUTRITIONAL INTAKE

Nutritional intake of Milk and Milk Products		Vegetarian	Non-vegetarian	Total
Daily	Count	38	33	71
	% within	60.3%	68.1%	64.0%
4-6 times/ week	Count	4	1	5
	% within	6.3%	2.1%	4.5%
2-4 times/ week	Count	20	11	31
	% within	31.7%	23.4%	27.9%
1-2 time /week	Count	1	0	1
	% within	1.6%	0.0%	.9%
Occasionally	Count	0	3	3
	% within	0.0%	6.4%	2.7%
Total	Count	63	48	111
	% within	100.0%	100.0%	100.0%
Value	Df.	Asymp. Sig. (2-sided)		
7.369	8	0.497		

Source: Primary Data

The dietary and nutrient intake pattern of the respondents do not vary significantly between vegetarians and non-vegetarians, with regarding to “milk and milk products”. 64 percent of respondents consume milk and milk products daily.

4. GREEN LEAFY VEGETABLES - DIETARY PATTERN AND NUTRITIONAL INTAKE

Dark greens also supply a significant amount of folate, a B vitamin that promotes heart health and helps protect against some kinds of birth defects. Other benefits of eating vegetables during pregnancy include their role in supporting: Healthy weight gain for mom. Just-right blood pressure and fights anemia.

A) DIETARY PATTERN

Dietary Pattern		Vegetarian	Non-vegetarian	Total
Very high		42.90%	31.00%	30.60%
High		30.20%	78.50%	36.0%
Moderate		22.20%	90.50%	30.6%
Low		4.80%	0%	2.70%
Total		100.00%	100.00%	100.00%
Value	Df.	Asymp. Sig.		
14.527	6	.024		

Source: Primary Data

Green leafy vegetables intake are approximately equal irrespective of the food habits of the pregnant women which is evident through the application of chi-square test. At 5 percent level of significance and 4 degrees of freedom (two-tailed test), there exists a significant association between food habit and green leafy vegetables intake in diet.

B) NUTRITIONAL INTAKE

Nutritional intake of Green Leaf Vegetables		Vegetarian	Non-vegetarian	Total
Daily	Count	47	27	74
	% within	74.6%	57.4%	66.7%
4-6 times / week	Count	4	12	16
	% within	6.3%	23.4%	14.4%
2-4 times/ week	Count	7	3	10
	% within	11.1%	6.4%	9.0%
1-2 times /week	Count	5	6	11
	% within	7.9%	12.8%	9.9%
Total	Count	63	48	111
	% within	100.0%	100.0%	100.0%
Value	Df.	Asymp. Sig. (2-sided)		
13.913 ^a	6	.031		

Source: Primary Data

The dietary and nutrient intake pattern of the respondents vary significantly between vegetarians and non-vegetarians, with regarding to “green leafy vegetables”. 80 percent of respondents consume green leafy vegetables almost regularly.

5. FRUITS - DIETARY PATTERN AND NUTRITIONAL INTAKE

Fruits can provide vitamins, folate, fiber, and more, which all help to keep the woman and baby healthy. These nutrients can also help to relieve some of the common symptoms of pregnancy. Pregnant women should aim to consume at least five different portions of fruit and vegetables each day.

A] DIETARY PATTERN

Dietary Pattern		Vegetarian	Non-vegetarian	Total
Very high		30.20%	64.30%	25.20%
High		20.60%	28.60%	22.50%
Moderate		49.20%	57.10%	49.50%
Low		0%	50.00%	2.70%
Total		100.00%	100.00%	100.00%
Value	Df.	Asymp. Sig.		
62.157 ^a	6	.000		

Source: Primary Data

Fruits intake is approximately equal irrespective of the food habits of the pregnant women which is evident through the application of chi-square test. At 5 percent level of significance and 4 degrees of freedom (two-tailed test), there exists a significant association between food habit and fruits intake in diet.

B] NUTRITIONAL INTAKE

Nutritional intake of Fruits		Vegetarian	Non-vegetarian	Total
Daily	Count	39	30	69
	% within	61.9%	61.7%	62.2%
4-6 times / week	Count	6	3	9
	% within	9.5%	6.4%	8.1%
2-4 times/ week	Count	12	9	21
	% within	19.0%	19.1%	18.9%
1-2 times /week	Count	0	6	6
	% within	0.0%	12.8%	5.4%
Occasionally	Count	3	0	3
	% within	4.8%	0.0%	2.7%
Never	Count	3	0	3
	% within	4.8%	0.0%	2.7%
Total	Count	63	48	111

		% within	100.0%	100.0%	100.0%
Value	Df.	Asymp. Sig. (2-sided)			
13.575 ^a	10	.193			

Source: Primary Data

The dietary and nutrient intake pattern of the respondents do not vary significantly between vegetarians and non-vegetarians, with regarding to “fruits”. 62.2 percent of respondents consume fruits daily.

6. MEAT AND POULTRY ITEMS - DIETARY PATTERN AND NUTRITIONAL INTAKE

Meat is a good source of protein, vitamin B12 and iron. A diet rich in iron will help prevent iron deficiency anaemia. Make sure all meat is cooked thoroughly to help avoid infection with toxoplasma as this can result in miscarriage. Fish is a good source of protein. Eggs contain a variety of vitamins including vitamin A, which assists with the healthy development of eyes and skin and contributes to a healthy immune system. They also contain other important nutrients for pregnancy, such as iodine, folate, and iron. Required for growth and development of infant.

A) DIETARY PATTERN

Dietary Pattern		Vegetarian	Non-vegetarian	Total
Very high		9.50%	57.10%	10.80%
High		6.30%	42.90%	19.80%
Moderate		12.70%	42.90%	23.40%
Low		23.80%	57.1%	18.90%
Very low		47.60%	0%	27.00%
Total		100.00%	100.00%	100.00%
Value	Df.	Asymp. Sig.		
68.413	8	.000		

Source: Primary Data

Meat and fish, egg intake is approximately equal irrespective of the food habits of the pregnant women which is evident through the application of chi-square test. At 5 percent level of significance and 4 degrees of freedom (two-tailed test), there exists a significant association between food habit and meat and poultry items intake in the diet.

B) NUTRITIONAL INTAKE

Nutritional intake of Meat and Poultry items		Vegetarian	Non-vegetarian	Total
4-6 times / week	Count	6	3	9
	% within	9.5%	6.4%	8.1%

2-4 times/ week	Count	10	36	46
	% within	15.9%	74.5%	41.4%
1-2 times /week	Count	2	3	5
	% within	3.2%	6.4%	4.5%
Occasionally	Count	6	6	12
	% within	9.5%	12.8%	10.8%
Never	Count	39	0	39
	% within	61.9%	0.0%	35.1%
Total	Count	63	48	111
	% within	100.0%	100.0%	100.0%

Value	Df.	Asymp. Sig. (2-sided)
62.157	6	0.001

Source: Primary Data

The dietary and nutrient intake pattern of the respondents vary significantly between vegetarians and non-vegetarians, with regarding to “meat and poultry items”. 41 percent of non-vegans consume meat and poultry items not more than 3 to 4 times a week.

7. FATS AND OILY ITEMS - DIETARY PATTERN AND NUTRITIONAL INTAKE

Human brains are made up of fats, so if pregnant woman to-be consuming foods made in ghee would aid in the baby's brain development. It helps in digestion, it nourishes both the baby and the mother and it's a healthy source of good fats. Adequate consumption of omega-3 fatty acids is vitally important during pregnancy as they are critical building blocks of fetal brain and retina. Omega-3 fatty acids may also play a role in determining the length of gestation and in preventing perinatal depression.

A) DIETARY PATTERN

Dietary Pattern	Vegetarian	Non-vegetarian	Total
Very high	9.50%	78.60%	18.90%
High	15.90%	9.50%	12.60%
Moderate	22.20%	47.60%	30.60%
Low	38.10%	57.10%	27.00%
Very low	14.30%	7.10%	10.80%
Total	100.00%	100.00%	100.00%
Value	Df.	Asymp. Sig.	
28.973	8	.000	

Source: Primary Data

Oil and ghee intake is approximately equal irrespective of the food habits of the pregnant

women which is evident through the application of chi-square test. At 5 percent level of significance and 4 degrees of freedom (two-tailed test), there exists a significant association between food habit and fats and oily items consumption in the diet.

B] NUTRITIONAL INTAKE

Nutritional intake of Fats and Oily items		Vegetarian	Non-vegetarian	Total
Daily	Count	0	3	3
	% within	0.0%	6.4%	2.7%
4-6 times / week	Count	0	6	6

	% within	0.0%	12.8%	5.4%
2-4 times/ week	Count	24	24	48
	% within	38.1%	48.9%	43.2%
1-2 times /week	Count	9	6	15
	% within	14.3%	12.8%	13.5%
occasionally	Count	24	3	27
	% within	38.1%	6.4%	24.3%
Never	Count	6	6	12
	% within	9.5%	12.8%	10.8%
Total	Count	63	48	111
	% within	100.0%	100.0%	100.0%
Value	Df.	Asymp. Sig. (2-sided)		
25.666 ^a	10	.004		

Source: Primary Data

The dietary and nutrient intake pattern of the respondents vary significantly between vegetarians and non-vegetarians, with regarding to “fats and oily items”.43.2 percent of respondents consume fats and oily items 2 to 4 times a week.

8. ROOTS AND FIBRES - DIETARY PATTERN AND NUTRITIONAL INTAKE

Colourful roots like beets (great for digestion and high in folate), sweet potatoes, yams (high in antioxidants and beta carotene), carrots (rich in fiber for healthy elimination and loaded with nutrition), as well as sulfur-rich onions, leeks, and garlic are good during pregnancy.

A] DIETARY PATTERN

Dietary Pattern	Vegetarian	Non-vegetarian	Total
Very high	19.00%	14.30%	16.20%
High	34.90%	21.40%	27.90%
Moderate	46.0%	150.00%	50.50%
Low	0.00%	14.30%	5.40%

Total		100.00%	100.00%	100.00%
Value	Df.	Asymp. Sig.		
17.817	6	.007		

Source: Primary Data

Roots and tubers intake are approximately equal irrespective of the food habits of the pregnant women which is evident through the application of chi-square test. At 5 percent level of significance and 4 degrees of freedom (two-tailed test), there exists a significant association between food habit and roots and fibres consumption in diet.

B) NUTRITIONAL INTAKE

Nutritional intake of Roots and Fibres		Vegetarian	Non-vegetarian	Total
Daily	Count	19	14	33
	% within	30.20%	29.80%	29.70%
4-6 times / week	Count	27	7	34
	% within	42.90%	14.90%	30.60%
2-4 times/ week	Count	9	15	24
	% within	14.30%	29.80%	21.60%
1-2 times /week	Count	2	9	11
	% within	3.20%	19.10%	9.90%
Occasionally	Count	6	3	9
	% within	9.50%	6.40%	8.10%
Total	Count	63	48	111
	% within	100.00%	100.00%	100.00%
Value	Df.	Asymp. Sig. (2-sided)		
20.782	8	0.008		

Source: Primary Data

The dietary and nutrient intake pattern of the respondents vary significantly between vegetarians and non-vegetarians, with regarding to “roots and fibres”. Only 29.7 percent of respondents consume roots and fibres almost daily.

9. SUGAR AND JAGGERY - DIETARY PATTERN AND NUTRITIONAL INTAKE

A low-sugar intake helps to keep your blood sugar more stable, along with resulting energy levels and is more likely to result in healthy pregnancy weight gain. Eating too much sugar when pregnant may increase your risk of gestational diabetes and pre-eclampsia and increases the risk of your baby becoming overweight later in life.

Jaggery helps in maintaining blood pressure, and preventing kidney and heart diseases. It is high in antioxidants. It flushes the toxins and lowers the chances of baby getting infected with any viruses. Iron is needed during pregnancy. Jaggery is rich in iron. Thus it helps in preventing maternal anaemia. Water retention is common during pregnancy. Jaggery helps to

reduce water retention. Jaggery is good for digestion. It helps in mitigating all gastrointestinal issues during pregnancy and ensures better digestion. Jaggery also reduces joint pain.

A] DIETARY PATTERN

Dietary Pattern	Vegetarian	Non-vegetarian	Total
Very high	6.30%	50.00%	6.30%
High	25.40%	14.30%	19.80%
Moderate	36.50%	102.4%	43.20%
Low	22.20%	19.00%	19.80%

Very low	9.50%	14.30%	10.80%
Total	100.00%	100.00%	100.00%
Value	Df.	Asymp. Sig.	
27.775	8	.001	

Source: Primary Data

Sugar and jaggery intake are approximately equal irrespective of the food habits of the pregnant women which is evident through the application of chi-square test. At 5 percent level of significance and 4 degrees of freedom (two-tailed test), there exists a significant association between food habit and sugar and jaggery intake in the diet.

B] NUTRITIONAL INTAKE

Nutritional intake of Sugar and Jaggery		Vegetarian	Non-vegetarian	Total
Daily	Count	3	6	9
	% within	4.8%	10.6%	8.1%
4-6 times / week	Count	6	9	15
	% within	9.5%	19.1%	13.5%
2-4 times/ week	Count	15	21	36
	% within	23.8%	44.7%	32.4%
1-2 times /week	Count	18	6	24
	% within	28.6%	12.8%	21.6%
Occasionally	Count	15	0	15
	% within	23.8%	0.0%	13.5%
Never	Count	6	6	12
	% within	9.5%	12.8%	10.8%
Total	Count	63	48	111
	% within	100.0%	100.0%	100.0%
Value	Df.	Asymp. Sig. (2-sided)		
32.708	10	.001		

Source: Primary Data

The dietary and nutrient intake pattern of the respondents vary significantly between vegetarians and non-vegetarians, with regarding to “sugar and jaggery”. 32.4 percent of respondents consume sugar and jaggery 2 to 4 times a week.

10. NUTS - DIETARY PATTERN AND NUTRITIONAL INTAKE A] DIETARY PATTERN

Dietary Pattern	Vegetarian	Non-vegetarian	Total
Very high	6.30%	50.00%	6.30%

High	25.40%	14.30%	19.80%
Moderate	36.50%	102.4%	43.20%
Low	22.20%	19.00%	19.80%
Very low	9.50%	14.30%	10.80%
Total	100.00%	100.00%	100.00%
Value	Df.	Asymp. Sig.	
27.775	8	.001	

Source: Primary Data

Nuts intake are approximately equal irrespective of the food habits of the pregnant women which is evident through the application of chi-square test. At 5 percent level of significance and 4 degrees of freedom (two-tailed test), there exists a significant association between food habit and nuts intake in the diet.

B] NUTRITIONAL INTAKE

Nutritional intake of Nuts		Vegetarian	Non-vegetarian	Total
Daily	Count	15	24	39
	% within	23.8%	48.9%	35.1%
4-6 times / week	Count	18	6	24
	% within	28.6%	12.8%	21.6%
2-4 times/ week	Count	15	9	24
	% within	23.8%	19.1%	21.6%
1-2 times /week	Count	6	9	15
	% within	9.5%	19.1%	13.5%
Occasionally	Count	3	0	3
	% within	4.8%	0.0%	2.7%
Never	Count	6	0	6
	% within	9.5%	0.0%	5.4%
Total	Count	63	48	111
	% within	100.0%	100.0%	100.0%
Value	Df.	Asymp. Sig. (2-sided)		

18.701 ^a	10	.044
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Source: Primary Data

The dietary and nutrient intake pattern of the respondents vary significantly between vegetarians and non-vegetarians, with regarding to “nuts”. 35 percent of respondents consume nuts, daily.

□ **Factors influencing nutritional intake based on food habits of the pregnant women**

Food habit and factors influencing nutritional intake	vegetarian	Non-vegetarian	Total
Due to the rich nutrients	42.9%	50.0%	43.2%

due to habituated	1.6%	7.1%	3.6%
doctors/ family/relatives suggest me to	41.3%	78.6%	36.9%
because of its availability	7.9%	64.3%	12.6%
because of affordability	6.3%	0.0%	3.6%
Total	100.0%	100.0%	100.0%
Value	Df.	Asymp. Sig. (2-sided)	
17.703 ^a	8	.024	

Source: Primary Data

Food habit and factors influencing nutritional intake are approximately equal irrespective of the food habits of the pregnant women which is evident through the application of chi-square test. At 5 percent level of significance and 4 degrees of freedom (two-tailed test), there exists a significant association between food habit and cereals intake in diet.

□ **Awareness and Knowledge of Nutritional Intake among Respondents**

Variables – Nutritional	Mean	Std. Deviation	F	Sig.
NNAPP	2.2162	0.96677	2.281	.065
Calcium Rich Foods	2.2432	0.91668	6.240	.000
Iron Utensils	2.4865	1.00783	7.817	.000
Iron And Vitamin A	2.2973	0.95912	8.177	.000
Germinated Food Grains	2.5135	1.18218	4.221	.003
Nutritional Deficiency	2.3514	0.94049	5.696	.000
Iodine Deficiency	2.4234	1.20265	7.946	.000
Iron And Folic Acid	2.5946	1.0819	5.774	.000
Under Nutrition	2.3784	1.02739	7.624	.000
Carbohydrate And Proteins	2.5946	1.20135	7.960	.000
Nutrition Impact On Foetus Growth	2.1712	1.11089	11.315	.000
Weight Gain	2.3604	1.15044	5.436	.001
Water Intake	2.1892	0.95835	11.505	.000

Vitamin C	2.3514	1.0238	6.296	.000
Zinc	2.3514	1.07575	3.149	.017

Source: Primary Data

From the above analysis on awareness level and magnitude of knowledge among pregnant women on nutrition and dietary practices during pregnancy. It was observed from the test of Anova at 5 percent significance level that, there exists a significant association (p-value < 0.01) between education level of the respondents and their opinion on twelve (expect on the statement; the policies on Iron and vitamin supplementation of government for pregnant women for combating anaemia, Importance of germinated food grains, need of zinc) of the total fifteen variables representing nutrition and dietary practices that of found to be play a significant importance during pregnancy.

Above are the mean (out of total awareness level of 5) and standard deviation on respective level of awareness. From the calculation of descriptive statistics it could be observed the, though the respondents have awareness about the respective variable, the level of knowledge they possess is not significant, i.e. out of total 5, the average awareness level ranges between 2.1712 to 2.5946, which is almost at an average level.

The variables is as follows; (i) the policies on Iron and vitamin supplementation of government for pregnant women for combating anaemia, (ii) Use of iron utensils for cooking, (iii) Iron and vitamin A rich foods, (iv) Calcium rich foods, (v) Importance of germinated food grains, (vi) Nutritional deficiency diseases during pregnancy, (vii) Iodine deficiency during pregnancy, (viii) Iron and folic acid supplements, (ix) Harmful effects of under nutrition, (x) Food-sources of carbohydrate, proteins, iron, vitamins and mine, (xi) Importance of nutrition in foetus growth, (xii) Knowledge about weight gain during pregnancy, (xiii) About water intake during pregnancy, (xiv) Need of vitamin C in the body, (xv) Need of zinc

□ □ Average Monthly Expenditure on Nutritional and Dietary Practices

Nutrients	Mean	Std. Deviation	Sig.1	Sig.2
Cereals	2.4324	1.08395	.003	.463
Vegetables	2.8108	1.14028	.413	.886
Fruits	3.1622	1.08327	.111	.056
Milk And Milk Products	3.0000	1.07026	.000	.059
Meat And Fish, Eggs	2.2703	1.27169	.050	.195
Millets	2.7027	.83769	.009	.299
Rice, Ragi, Jowar, Wheat and Maize	3.1351	.93892	.010	.000
Dry Fruits	3.4324	1.10882	.839	.099

Source: Primary Data

The above table on average monthly expenditure incurred by the household for purchase on groceries. From the calculations of descriptive statistics and data representation techniques like, mean (out of total 5), standard deviation, frequencies and percentages it was observed that;

(i) 40 percent of respondents spend on an average around Rs.401 to Rs.600 per month on purchasing cereals, similarly, (ii) 32.4 percent of respondents spend on an average around Rs.401 to Rs.600 per month on purchasing vegetables, (iii) 37.8 percent of respondents spend on an average around Rs.401 to Rs.600 per month on purchasing fruits, (iv) 43.2 percent of respondents spend on an average around Rs.401 to Rs.600 per month on purchasing milk and milk products, (v) 37.8 percent of respondents spend on an average around Rs.200 and below per month on meat, fish and eggs (because of majority of respondents being vegans), (vi) 45.9 percent of respondents spend on an average around Rs.401 to Rs.600 per month on purchasing millets, (vii) 51.1 percent of respondents spend on an average around Rs.401 to Rs.600 per month on purchasing rice, ragi, jowar, wheat and maize, and (viii) 40.5 percent of respondents spend on an average around Rs.401 to Rs.600 per month on purchasing dry fruits.

Further through the application of inferential statistics test like ANOVA, at 1 percent level of significance, [Sig.1] there is no significant association (p -value < 0.01) among the education level of the respondents and the average monthly household expenditure on purchase of groceries during pregnancy in five of the total eight cases as provided in the above table. Similarly, [Sig.2] there was no significant association (p -value < 0.01) among, the perception of women about the importance of nutritional and dietary practices during the pregnancy and the average monthly household expenditure on purchase of groceries during pregnancy in seven of the eight cases as provided in the above table.

□□ Level of Awareness about the State and Central Government Schemes for Welfare of Pregnant women

I. Almost all 111 (100 percent) of the total sampled respondents are aware of at least one of the social welfare scheme of the government offered for welfare of pregnant women from lower income family in rural areas.

II. State and Central Government Scheme and Level of Awareness

State and Central Government Scheme	Mean	Std. Deviation	F	Sig.
PM Matru Vandana Yojana (PMMVY)	1.8919	0.83504	0.096	0.984
PM Surakshit Matritva Abhiyan (PMSMA)	2.5676	0.75825	0.671	0.614
Janani Suraksha Yojana (JSY)	2.4054	0.85683	4.272	0.003
Mathrupoorna Yojana (MY)	2.7568	1.02882	4.137	0.004
Karnataka Prasoothi Araika Scheme (KPAS)	2.8108	1.14028	3.391	0.012
Thayi Bhagya Scheme (TBS)	2.1351	0.87891	2.242	0.069

Source: Primary Data

The above table on the level of awareness among the respondents about various State and Central government scheme offered for the welfare of women during pregnancy, through the

calculation of both descriptive like mean (out of total 5), standard deviation and inferential statistics like Anova and Post-hoc Test, it was observed that;

- The level of awareness level among the respondents about PM Matru Vandana Yojana (PMMVY) is low with a mean value of 1.89. Further with the p-value of 0.984, there is no significant association ($p\text{-value} > 0.05$) between average monthly household income and the awareness level of the respondent about the scheme.

- The level of awareness level among the respondents about PM Surakshit Matritva Abhiyan (PMSMA) is at a moderate level with a mean value of 2.57. Further with the p-value of 0.614, there is no significant association ($p\text{-value} > 0.05$) between average monthly household income and the awareness level of the respondent about the scheme.

- The level of awareness level among the respondents about Janani Suraksha Yojana (JSY) is at a moderate level with a mean value of 2.41. Further with the p-value of 0.003, there is significant association ($p\text{-value} < 0.05$) between average monthly household income and the awareness level of the respondent about the scheme.

Further, with the application of post-hoc test, it was observed that the respondents with the household income of Rs.10000 and below, Rs.30000 to Rs.40000 and Rs.20001 to Rs.30000 ranks 1st (mean: 3.000), 2nd (mean: 2.7273), and 3rd (mean: 2.5000) with respect to the level of awareness about the scheme.

- The level of awareness level among the respondents about Mathrupoorna Yojana (MY) is at a moderate level with a mean value of 2.76. Further with the p-value of 0.004, there is significant association ($p\text{-value} < 0.05$) between average monthly household income and the awareness level of the respondent about the scheme.

Further, with the application of post-hoc test, it was observed that the respondents with the household income of Rs.20001 to Rs.30000, Rs.10000 and below and Rs.30001 to Rs.40000 ranks 1st (mean: 3.167), 2nd (mean: 3.000), and 3rd (mean: 2.818) with respect to the level of awareness about the scheme.

- The level of awareness level among the respondents about Karnataka Prasoothi Araika Scheme (KPAS) is at a moderate level with a mean value of 2.811. Further with the p-value of 0.012, there is significant association ($p\text{-value} < 0.05$) between average monthly household income and the awareness level of the respondent about the scheme.

Further, with the application of post-hoc test, it was observed that the respondents with the household income of Rs.40001 and above, Rs.30001 and Rs.40000, Rs.20001 and Rs.30000 and Rs.10000 and below ranks 1st (mean: 3.333), 2nd (mean: 3.000), 3rd (mean:3.000), and 4th (mean: 3.000), respectively, with respect to the level of awareness about the scheme.

- The level of awareness level among the respondents about Thaiy Bhagya Scheme (TBS) is low with a mean value of 2.135. Further with the p-value of 0.069, there is no significant association ($p\text{-value} > 0.05$) between average monthly household income and the awareness level of the respondent about the scheme.

III. Almost all 111 (100 percent) of the total sampled respondents have registered or is a beneficiary of at least one of the social welfare scheme of the State or Central Government offered for welfare of pregnant women from lower income family in rural areas.

□□ Type of Facilities availed by the Respondents under a Welfare Scheme of the Government for Pregnant Women

Facilities	Frequency	Percentage
Antenatal Services	42	37.8
Take Home Ration	60	54.1
Immunization	42	37.8
Financial Assistance	53	47.7
Institutional Delivery	51	45.9
Baby crèche	42	37.8

Source: Primary Data

The enquiry about the types of services or facilities availed by the respondents under the State or Central Government Welfare scheme for pregnant women, it was observed that; on an average, not more than 50 percent of the each of the facilities extended by the government was utilized by the beneficiaries.

□ Level of Satisfaction of Respondent towards Welfare Scheme Offered by the State and Central Government for Pregnant Women.

Level of Satisfaction about the welfare scheme		Vegetarian	Non-Vegetarian	Total
highly satisfied	Between Groups	18	6	24
	Within Groups	28.6%	12.8%	21.6%
satisfied	Total	18	21	39
	Between Groups	28.6%	42.6%	35.1%
neutral	Within Groups	21	18	39
	Total	33.3%	38.3%	35.1%

dissatisfied		Between Groups	6	3	9
		Within Groups	9.5%	6.4%	8.1%
Total		Total	63	48	111
		Between Groups	100.0%	100.0%	100.0%
Value	Df.	Asymp. Sig. (2-sided)			
6.987 ^a	6	.322			

Source: Primary Data

The above table on the level of satisfaction of respondents towards the benefits extended by the State and Central Government for pregnant women under different its social welfare schemes, only around 56 percent of the respondents are satisfied with the scheme. Through the application of chi-square test, the obtained p-value is 0.322 (at 5 percent level of significance), it can be concluded that, there if no significant association between for habits and level of satisfaction among respondents.

Findings and Suggestions for the Future Policy Implications

A] Based on the respondents surveyed in the study, all the 111 pregnant women were having basic awareness about the nutritional and dietary practices and follow it consciously during the time of pregnancy, however there are some valuable insights that were obtained that needs to be looked upon and is as follows;

- (i) There is no sufficient awareness about the intake of certain nutrients that are much essential for child growth in the embryo
- (ii) Majority of respondents are limiting the nutritional intake due to lower household income, thus sometimes following the same food consumption practices (dietary practices) as followed by the other members of the family.

Recommendations:

- (i) Awareness on the significance of various type of nutrients in the dietary practices of the pregnant women must be created through doctors, nurses, Asha workers, Self-help groups, cooperative bodies and other workforce allotted by the government for each Anganwadi, Gram Panchayath, and the government offices who are present in each village.
- (ii) The government with the support of doctors, nurses, Asha workers, Self-help groups, cooperative bodies and other workforce allotted by the government for each

Anganwadi, Gram Panchayath, and the government offices must identify the eligible individuals and take cognizance about their financial position and requirement for and provision of such facilities would encourage the beneficiaries to follow proper nutrition intake and follow proper dietary practices.

B] The government at both state and central levels are extending necessary facilities for the pregnant women under various welfare schemes. But it found that not more than 50 percent of the each of the facilities extended by the government was utilized by the beneficiaries. When the same was enquired with the respondents and the Asha workers, it was found that, this was because of;

- (i) The lack of awareness among the households living in the rural areas about the scheme,
- (ii) Insufficiency of outreach programme of the government or the local government in rural areas,
- (iii) Lack of interest among the people towards availing of certain beneficial schemes of the government due to the unavailability of certain items (medicines) with the Anganwadi Centres' and Asha workers and the perceived quality about the medical services extended by the Government hospitals.
- (iv) Unavailability of necessary workforce/ labour for the delivery of social welfare facilities to the beneficiaries, which has made the individual worker appointed by the authority to do multiple tasks.
- (v) Due to noise/ divergent views present in the society or community, about government schemes, its significance, facilities offered and finally about the process involved in availing the facilities extended by the government through Anganwadi Centres.

Recommendations:

- (i) **Extending of facilities and support through the Anganwadi Centres is a good step, the government should initiate or encourage self-help groups (SHGs) and different Cooperative groups present in every village for the conduction of awareness or outreach initiatives for reaching the beneficiaries living in interior location of rural areas. This will also reduce the problem of labour shortage.**
- (ii) **Understanding of the need of different sections of the society living in rural areas, vis-à-vis people of different community, culture and segment of the society in particular to those living in rural area and making availability of such facilities would go about in reshaping the society's' perception or views about the service quality (tangibility, responsiveness, reliability, assurance and empathy) of the government to the most desirable sections of the societies through proper research and analytics.**
- (iii) **The channel of communication should be realigned such that, the divergent views about the welfare schemes within the society should be traced and necessary actions and relevant awareness must be provided.**

References

- Alberda, C., Gramlich, L., Jones, N., Jeejeebhoy, K., Day, A. G., Dhaliwal, R., & Heyland, D. K. (2009). The relationship between nutritional intake and clinical outcomes in critically ill patients: results of an international multicenter observational study. *Intensive care medicine*, 35, 1728-1737.
- Chen, X., Zhao, D., Mao, X., Xia, Y., Baker, P. N., & Zhang, H. (2016). Maternal dietary patterns and pregnancy outcome. *Nutrients*, 8(6), 351.
- Cheng, Y., Dibley, M. J., Zhang, X., Zeng, L., & Yan, H. (2009). Assessment of dietary intake among pregnant women in a rural area of western China. *BMC Public Health*, 9, 1-9.
- Grotkowski, M. L., & Sims, L. S. (1978). Nutritional knowledge, attitudes, and dietary practices of the elderly. *Journal of the American Dietetic Association*, 72(5), 499-506.
- Lee, S. E., Talegawkar, S. A., Merialdi, M., & Caulfield, L. E. (2013). Dietary intakes of women during pregnancy in low-and middle-income countries. *Public health nutrition*, 16(8), 1340-1353.
- Nieuwenhuizen, W. F., Weenen, H., Rigby, P., & Hetherington, M. M. (2010). Older adults and patients in need of nutritional support: review of current treatment options and factors influencing nutritional intake. *Clinical nutrition*, 29(2), 160-169.
- Paul, V. K., Singh, A., & Palit, S. (2018). POSHAN Abhiyaan: Making nutrition a jan andolan. *Proceedings of the Indian National Science Academy*, 84(4), 835-841.
- Pooja, M. (2022). National nutrition mission or Poshan Abhiyaan fighting with undernutrition among children, lactating mothers and pregnant women: an analysis. *Journal of the Asiatic Society of Mumbai National*, 96(10), 107-117.
- Raghavan, R., Dreibelbis, C., Kingshipp, B. L., Wong, Y. P., Abrams, B., Gernand, A. D., ... & Stoody, E. E. (2019). Dietary patterns before and during pregnancy and maternal outcomes: a systematic review. *The American journal of clinical nutrition*, 109, 705S- 728S.
- Salama, A., & Esmail, N. (2018). Assessing nutritional awareness and dietary practices of college-aged students for developing an effective nutrition educational plan. *Canadian Journal of clinical nutrition*, 6(2).
- Teixeira, J. A., Castro, T. G., Grant, C. C., Wall, C. R., Castro, A. L. D. S., Francisco, R. P. V., ... & Marchioni, D. M. (2018). Dietary patterns are influenced by socio- demographic conditions of women in childbearing age: a cohort study of pregnant women. *BMC Public Health*, 18, 1-14.
- YoJAnA, V. (2018). A CRITICAl EVAlUAtIon oF PRAdHAn MAnTRI MAtrU. *Jindal Journal of Public Policy*, 46.