A COMPARATIVE STUDY ON NUTRITIONAL AND HEALTH STATUS OF TRIBAL AND NON-TRIBAL REPRODUCTIVE WOMEN IN ANANTNAG DISTRICT, JAMMU AND KASHMIR

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Abstract

The purpose of this paper is to study the nutritional and health status of tribal and non-tribal reproductive women in Anantnag district, Jammu and Kashmir. The sample of the study consists of 300 respondents, which were selected by Multistage Random Sampling Method. The major objectives of the study are:- 1. To study the nutritional status of the tribal and the non tribal reproductive women in the study area. 2. To identify the factors affecting the nutritional status of the tribal and the non tribal reproductive women in the study area. 3. To examine the factors determining the tribal and the non tribal women's reproductive health status in the study area. Socio-cultural and economic factors which interrupt on reproductive health include women's lack of awareness of health and nutrition matters, strong privacy indifference towards family planning, lack of proper health awareness from the side of health personal, encouraging frequent and continuous pregnancies which frequently result in maternal mortality, morbidity and delivery complications. In considering priorities for health, greater effort and resources are required to increase their awareness and change attitudes towards health issues. It was observed that the tribal women generally do not pay much attention to their nutritional and health problems especially during pregnancy and lactation where food and nutrient requirements are more. The nutritional and health problems of both tribal and non tribal reproductive women need special attention because the tribal people have distinctive health problems. In this regard, the researcher attempted to analyze the nutritional and health status of the tribal and non tribal reproductive women in Anantnag District, Jammu and Kashmir.

Keywords: *Health Status, Nutritional Status, Health Seeking Behavior, Health Care Facilities*

INTRODUCTION:

Health is the major component of human resources, which contributes to economic development and permits people to lead economically productivity and socially satisfying lives. Proper nutrition and reduction of sickness increase work productivity and life expectancy and promote economic development. A good health is to increase productivity, per capita income and standard of living. The purpose of development is to permit people to lead economically productive and socially satisfying lives. The social and economic improvements that increase purchasing power can bring to them and their children better nutrition and health status.

Health and nutrition are important elements in the development process. Adequate nutrition enhances physical health, there by improves immune system and reproductive health fitness. Both nutrition and health increases life expectancy, which is known to be important for development. Although primarily health is a function of nutritional status, other factors like availability, quality and cost of health care services, living standards, sanitary conditions, quality of drinking water and economic conditions are also important. With the significant development in treatments and medical services, people have become highly aware and cautious about their health and fitness (Sudipta 2009).

Malnutrition refers to a disorder of nutrition whether it is due to dietary deficiency, called under-nutrition or to excess diet, called over-nutrition (Britannica Student Encyclopedia, 2005). Malnutrition results from an imbalance between the needs of the bodies and the intake of nutrients. Malnutrition worldwide includes a spectrum of nutrient– related disorders, deficiencies, and conditions such as intrauterine growth retardation, protein-energy malnutrition, iodine deficiency disorders, vitamin A deficiency, iron-deficiency anemia and overweight/obesity and other diet- related non-communicable diseases (Ratzan *et al*., 2000).

Undernutrition and poor health from preventable causes disproportionately affect the well-being of millions of people in the developing world. Factors at the individual, household and community levels or a combination of these factors, may contribute to poor nutrition and health status. In particular, malnutrition among women is likely to have a major impact on their own health as well as their children's health. More than 3.5 million women and children under age five in developing countries die each year due to the underlying cause of undernutrition (Robert et al., 2008).

In earlier days, developing countries experienced a high prevalence of under-nutrition, but this era of transition has brought a double burden of under-nutrition and over nutrition. While under-nutrition (underweight and stunting) is still prevalent in most of the developing countries, the rates of overweight and obesity are steadily increasing, especially among adults. Hence, the countries in transition face today new public health problems, while they are yet to eradicate completely the nutritional deficiencies. Once considered a problem related to affluence, the junk food induced overweight and obesity is growing rapidly in many developing countries nowadays. This is also due in large part to increasing urbanization and changes in diet and lifestyle, in particular the "nutrition transition" away from fruits, vegetables and greater consumption of more 'energy-dense, nutrient–poor' diets, dependence on television for leisure along with reduced levels of physical activity (World Health Organization 2000, 2003). Overweight and obesity is a risk factor for a number of chronic non-communicable diseases**,** such as diabetes, hypertension, asthma, cardiovascular disease, some cancers, gallbladder disease and osteoarthritis – all of which are on the rise in developing countries, particularly among the middle-class, urban populations (Gopalan, 1998; Popkin et al., 2001). On the other hand, the Chronic Energy Deficiency (CED) is associated with impaired physical capacity reduced economic productivity increased mortality (National Institute of Nutrition, 1991) and poorer reproductive outcomes. Some evidence in developing countries indicates that malnourished individuals, that is, women with a Body Mass Index (BMI) below 18.5 kg/m^2, show a progressive increase in mortality rates as well as increased risk of illness. The World Health Organization estimates that in 1995, about one million adult deaths resulted from health

problems exacerbated by over-nutrition while half of it was associated with under-nutrition (WHO, 1998).

The nutritional status of women is important both for the quality of their own lives and the survival and healthy development of their children. Better nutrition means stronger immune system, fewer incidences of illness and better health. However, recent evidence from developed countries indicate that malnourished women with a body Mass Index (BMI) below 18.5 show a progressive increase in mortality rates as well as an increased risk of illness. In India, increased prenatal and neonatal mortality, a higher risk of low birth weight babies, stillbirths and miscarriage are some of the consequences of malnutrition among women (Mallikharjuna 2010).

REVIEW OF LITERATURE:

1. Bandana Sachdev (2012) revealed that the tribal people do not prefer to visit hospitals frequently. It further confirms that they did not prefer to visit hospitals even for delivering their child inspite of having aware about the incentives are given for delivery of the child in the government hospitals. They still depend on Dias more as compared to professional doctors. Elderly ladies of the community help in conducting the delivery. The naval cord is cut by the mother herself with the help of a bamboo strip, knife and stone. They prefer to cut the naval cord with a bamboo strip because it is safer from infections. The main hindrance in the poor health status of nomad tribals is the nomad tribal environment and non acceptance of community towards professional doctors and their association with strong social networks identified as key determinants for perception in all communities. However, the inaccessibility and unaffordability to health care and reluctance to seek help for health issues remain a significant problem in nomad tribal areas. In considering priorities for health, greater endeavour resources are required to increase their awareness and change attitude towards acceptance of nowadays health care services.

2. Basu (1990) has clarified that the maternal and child health care is an important aspect of health seeking behaviour, which is largely neglected among the tribals. The planners have to take into consideration the lifestyle, beliefs, culture milieu, social organization and the channels of communication of the tribal people before introducing developmental activities. The MCH services are almost non-existent and the childhood mortality is comparatively high. Comprehensive area specific health related studies are limited; most of the available studies are isolated, fragmentary and did not cover the various dimensions of health affecting the status of tribal women. Early marriage, successive pregnancies accompanied with low calories of food intake and inaccessibility and underutilization of medical facilities lead to high maternal morbidity and mortality rate. Maternal depletion is thus the result of early matting, continuous cycles of pregnancy and lactation. The inadequate diet and uninterrupted overwork lead to cummmulative disorders such as anaemia, general malnutrition, premature ageing and early death.

3. Boban (1998) described the treatment pattern among the tribals and revealed that they were using more than one medical system to deal with their illness. In olden times, the tribals who lived inside dense forests, completely isolated from the modern civilization, have been making uses of their etho-medicine for the treatment of whatever diseases are afflicting them.

But in the alter circumstances of the present day, the tribals are exposed to various kinds of medical system in addition to their own. Even though they accept that modern medicine is efficacious in the treatment of various illnesses, they consider ethno-medicine as the only remedy for certain other illness. They cannot understand the logic of using modern medicine in illness caused by super natural forces but are ready to accept the efficacy of modern medicine in diseases accruing through natural causes. Thus, they make an arbitrary division of the illness and use both systems of medicine selectively.

4. Chandraker et al., (2009) conducted a cross-sectional study to understand "Reproductive and Child Health among the Dhur Gond Tribal Community of Mahasamund District, Chhattisgarh, India". They revealed that high percentage of mothers had not taken antenatal check-ups (51.72 percent), tetanus injection (41.38 percent) and iron and folic acid tablets (56.32 percent) during pregnancies. 94.83 percent deliveries performed at home and 57.47 percent births were done mainly by untrained dais (traditional birth attendants). Infant and child mortality rates were 5.92 and 4.28 per 100 live births respectively. 47.12 percent of mothers were undernourished (BMI <18.5 kg/m2) and all the children were suffered from malnutrition.

5. Nirmala Reddy B. (1998) revealed that the mean BMI increases with the better socio-economic status of the constituent groups and with decreased physical activity level. A trend of a decrease in the proportion of individuals with chronic energy deficiency and an increase in the proportion of obese individuals was also seen from the traditional Yerukala tribe (group 1) to the urbanized group 4, from the lower to the higher income categories and from heavy to light physical activity types. Smokers show a greater proportion of obese cases compared with non-smokers. The prevalence of obesity (BMI > 25) is 6.6 percent in males and 10 percent in females. The results of the analysis of variance suggest that three of the four socio-economic and behavioral variables (except smoking) show significant effects on age-adjusted BMI, and the R^2 suggests that these variables explain 27.4 percent of the variation in males and 17 percent in females. Although income explains the largest amount of variation (24%) in males, followed by physical activity and group affiliation, in female group affiliation (12.5%), followed closely by income, accounted for most of the variation. Hence, the positive association between socio-economic status and BMI was observed in the present study.

OBJECTIVES:

1. To study the nutritional status of the tribal and the non tribal reproductive women in the study area.
2. To identify the factors affecting the nutritional status of the tribal and the non tribal reproductive womenin the study area.
3. To examine the factors determining the tribal and the non tribal women's reproductive health status in the study area.

METHODOLOGY:

The unique feature of four tier area sampling design has been executed to get a random sample of 300 respondents from the Kashmir valley. The sampling of the study is

said to be *Multi- Stage Random sampling method*. The first stage of sampling involves the selection of district from the Kashmir. Out of 10 districts of Kashmir, Anantnag district has the highest number of scheduled tribe population of 1,16,006 according to the 2011 census, so in the first stage, the Anantnag district was selected for the present study. The second stage of sampling involves the selection of two blocks from the district. The Anantnag district has 8 blocks namely Dachnipoa, Khoviripora, Breng, Shangas, Qazigund, Shahabad, Achabal and Quimoh. Out of these 8 blocks, two blocks namely Dachnipora and Breng were selected on the basis of high concentration of scheduled tribe population. The third stage of sampling involves the selection of six villages from the two selected blocks. The three villages namely Marhama, Lehandajan and Awoora were selected randomly from Dachnipora block and three villages namely Paniz Gam, Now Bough and Gaw Ran were selected randomly from Breng block. The fourth stage of sampling involves the selection of respondents from the six selected villages. The sample of 50 respondents of both tribal and tribal respondents was selected from each village and thus a total sample of 300 respondents has been selected from the Anantnag district for the present study.

ANALYSIS AND DISCUSSIONS:

Anthropometric Parameters and Body Mass Index of the Respondents

Anthropometry is widely used; an inexpensive and non-invasive measure of the general nutritional status of anindividual or a population group (Cogill, 2001).

Mean height, weight and BMI of the respondents in the study area

Height and weight measurement of both the tribal and non tribal reproductive women were taken and BMI was calculated to assess their nutritional profile. The mean values of height, weight and BMI for the tribal and non tribal reproductive women are presented in the table-1.

Table-1
Mean Height, Weight and Body Mass Index of the Respondents

Age Group (in years)	Tribals				Non Tribals				Total
	Total	Height	Weight	BMI	Total	Height	Weight	BMI	
18-27	26	5.57	56.51	19.47	36	5.67	63.65	21.19	62
28-37	52	5.51	59.49	20.96	54	5.60	60.89	20.83	106
38-47	47	5.55	62.72	22.38	39	5.57	61.99	21.56	86
Above-47	25	5.53	64.73	22.69	21	5.54	62.48	21.82	46
Total	**150**	**5.54**	**60.69**	**21.37**	**150**	**5.61**	**62.08**	**21.28**	**300**

Source: Computed from primary data

Table-1 shows the mean Height, Weight and Body Mass Index of the reproductive tribal and non tribal women. The mean height of 5.54 inches was recorded for tribal reproductive women and the maximum height 5.57 inches was at the age of 18- 27 years, after which there seems to be a decline, while for non tribal reproductive women, the mean height was lower i-e 5.51 inches and it was found to be maximum 5.57 inches at the age of 18-27 years which decrease as age progresses. The mean weight of the tribal reproductive women was 60.69

Kg while as the mean weight of the non tribal reproductive women was 62.08 Kg. It was also observed that among tribal reproductive women, weight was directly proportional to age while in case of non tribal reproductive women, the maximum weight of 63.65 Kg was observed at the age of 18-27 years. The mean BMI was found to be 21.37 for the tribal reproductive women while as for the non tribal reproductive women the mean BMI was 21.28. It was also observed that among tribal reproductive women, the mean BMI was high 21.82 at the age above-47 years while as in case of non tribals, the mean BMI was high 21.82 at the age of above-47 years.

Categorization of selected adults based on BMI

BMI has been shown to be a good indicator of nutritional status. Based on BMI, the respondents were classified into four categories viz Undernourished (BMI<18.4), Normal (BMI=18.5-22.9), Overweight (BMI=23-24.9) and Obese (BMI >25) (ICMR 2010). BMI is a key index for relating weight to height. BMI is a person's weight in kilograms (kg) divided by his or her height in meters squared. The BMI limit for Indians prescribed by ICMR is as given in table-2.

Equation for Predicting

$$BMI = Weight\ in\ Kg \div (Height\ in\ meter)^2$$Table-2

The BMI Limit for Indians (ICMR 2010)

BMI rank	Status
<18.4	Undernourished
18.5 to 22.9	Normal
23 to 24.9	Overweight
>25	Obese

Source: www.healthizen.com

Table-3
Age-Wise Distribution of Body Mass Index of the Respondents

Age Group (in Years)	Body Mass Index								Total
	Undernourished (<18.4)		Normal (18.5-22.9)		Overweight (23-24.9)		Obese (>25)		
	Tribal	Non Tribal	Tribal	Non Tribal	Tribal	Non Tribal	Tribal	Non Tribal	
18-27	13	10	15	14	2	5	1	2	62
	(21)	(16.1)	(24.2)	(22.6)	(3.2)	(8.1)	(1.6)	(3.2)	(100)
28-37	19	16	28	25	4	7	2	5	106
	(18)	(15.1)	(26.4)	(23.5)	(3.7)	(6.6)	(2)	(4.7)	(100)
38-47	12	11	20	26	7	4	2	4	86
	(14)	(13)	(23.2)	(30.2)	(8.1)	(4.6)	(2.3)	(4.6)	(100)
Above-47	6	4	13	16	2	2	1	2	46
	(13.1)	(8.7)	(28.3)	(34.8)	(4.3)	(4.3)	(2.2)	(4.3)	(100)
Total	**50**	**41**	**76**	**80**	**15**	**18**	**9**	**11**	**300**
	(16.3)	**(14)**	**(24.7)**	**(27)**	**(5)**	**(6)**	**(2)**	**(4)**	**(100)**

Source: Computed from primary data

Note: Figures in parentheses denote percentages to the row total

Table-3 shows the age wise distribution of the Body Mass Index of the respondents. In case of undernourished category, the tribals shows the highest 21 percent of respondents under 18-27 years age group and lowest 13.1 percent of respondents under the above-47 years age group while as the non tribals shows the highest 16.1 percent of under 18-27 years age group and lowest 8.7 percent of respondents under the above-47 years age group. In case of normal category, the tribals shows the highest 28.3 percent of respondents under above-47 years age group and lowest 23.2 percent of respondents under 18-27 years age group while as the non tribals shows the highest 34.8 percent of respondents under above-47 years age group and lowest 22.6 percent of respondents under the 18-27 years age group. In case of overweight category, the tribals shows the highest 8.1 percent of respondents under 38-47 years age group and lowest 3.2 percent of respondents under the 18-27 years age group while as the non tribals shows the highest 8.1 percent of under 18-27 years age group and lowest 4.3 percent of respondents under the above-47 years age group. In case of obese category, the tribals shows the highest 2.3 percent of respondents under 38-47 years age group and lowest 1.6 percent of respondents under the 18-27 years age group while as the non tribals shows the highest 4.7 percent of under 28-37 years age group and lowest 3.2 percent of respondents under the 18-27 years age group.

Table-4
Type of Family-Wise Distribution of Body Mass Index of the Respondents

Type of Family	Body Mass Index								Total
	Undernourished (<18.4)		Normal (18.5-22.9)		Overweight (23-24.9)		Obese (>25)		
	Tribal	Non Tribal	Tribal	Non Tribal	Tribal	Non Tribal	Tribal	Non Tribal	
Joint family	20 (21.1)	17 (18)	21 (22.1)	23 (24.2)	4 (4.2)	5 (5.2)	2 (2.1)	3 (3.1)	95 (100)
Nuclear Family	30 (14.6)	24 (11.7)	55 (27)	57 (28)	11 (5.3)	14 (7)	7 (3.4)	8 (4)	205 (100)
Total	**50 (16.3)**	**41 (14)**	**76 (24.7)**	**80 (27.3)**	**15 (5)**	**18 (6)**	**9 (3)**	**11 (3.7)**	**300 (100)**

Source: Computed from primary data
Note: Figures in parentheses denote percentages to the row total

Table-4 shows the type of family wise distribution of the Body Mass Index of the respondents. In case of undernourished category, the tribals shows the highest 21.1 percent of respondents under joint family group and lowest 14.6 percent of respondents under the nuclear family group while as the non tribals shows the highest 18 percent of respondents under the Joint family group and lowest 11.7 percent of respondents under the nuclear family group. In case of normal category, the tribals shows the highest 27 percent of respondents under nuclear family group and lowest 22.1 percent of respondents under the joint family group while as the non tribals shows the highest 28 percent of respondents under the nuclear

family group and lowest 11.7 percent of respondents under the joint family group. In case of overweight, the tribals shows the highest percentage of 5.3 respondents nuclear family group and lowest 4.2 percent of respondents under the Joint family group while as the non tribals shows the highest percentage of 7 under nuclear family group and lowest 5.2 percent under the joint family group. In case of overweight category, the tribals shows the highest 5.3 percent of respondents under nuclear family group and lowest 4.2 percent of respondents under the joint family group while as the non tribals shows the highest 7 percent of respondents under the nuclear family group and lowest 5.2 percent of respondents under the joint family group. In case of obese category, the tribals shows the highest 3.4 percent of respondents under nuclear family group and lowest 2.1 percent of respondents under the joint family group while as the non tribals shows the highest 4 percent of respondents under the nuclear family group and lowest 3. 1 percent of respondents under the joint family group.

Table-5
Education-Wise Distribution of BMI of the Respondents

Educational level	Body Mass Index								Total
	Undernourished (<18.4)		Normal (18.5-22.9)		Overweight (23-24.9)		Obese (>25)		
	Tribal	Non Tribal	Tribal	Non Tribal	Tribal	Non Tribal	Tribal	Non Tribal	
Illiterate	32 (20)	24 (15)	34 (21.2)	39 (24.4)	8 (5)	10 (6.2)	6 (3.8)	7 (4.4)	160 (100)
Primary	15 (19)	12 (15.2)	19 (24)	21 (26.5)	3 (4)	5 (6.3)	2 (2.5)	2 (2.5)	79 (100)
Secondary	5 (13.5)	4 (10.8)	12 (32.5)	11 (29.7)	1 (2.7)	2 (5.4)	1 (2.7)	1 (2.7)	37 (100)
Higher Secondary	1 (6.7)	1 (6.7)	6 (40)	6 (40)	-	1 (6.6)	-	-	15 (100)
Graduation & above	-	-	5 (55.6)	3 (33.3)	-	1 (11.1)	-	-	9 (100)
Total	**53 (17.7)**	**41 (13.7)**	**76 (25.3)**	**80 (26.7)**	**12 (4)**	**18 (6)**	**9 (3)**	**11 (3.6)**	**300 (100)**

Source: Computed from primary data

Note: Figures in parentheses denote percentages to the row total

Table-5 shows the occupation wise distribution of the Body Mass Index of the respondents. In case of undernourished category, the tribals shows the highest 20 percent of respondents under illiterates and lowest 6.7 percent of respondents under the higher secondary level while as the non tribals shows the highest 15.2 percent of respondents under primary level and lowest 6.7 percent of respondents under the higher secondary level. In case of normal category, the tribals shows the highest 55.6 percent of respondents under graduation & above level and lowest 21.25 percent of respondents under the illiterates while as the non tribals shows the highest 40 percent of respondents under higher secondary level

and lowest 24.4 percent of respondents under the illiterate level. In case of overweight category, the tribals shows the highest 5 percent of respondents under illiterates category and lowest 2.7 percent of respondents under the secondary level while as the non tribals shows the highest 11.1 percent of respondents under graduation & above level and lowest 5.4 percent of respondents under the secondary level. In case of obese category, the tribals shows the highest 3.8 percent of respondents under illiterates and lowest 2.5 percent of respondents under the primary level while as the non tribals shows the highest 4.4 percent of respondents under higher secondary level and lowest 2.5 percent of respondents under the primary level.

Table-6
Occupation-Wise Distribution of Body Mass Index of the Respondents

Occupation	Body Mass Index								Total
	Undernourished (<18.4)		Normal (18.5-22.9)		Overweight (23-24.9)		Obese (>25)		
	Tribal	Non Tribal	Tribal	Non Tribal	Tribal	Non Tribal	Tribal	Non Tribal	
Agricultural labourer	20 (20.8)	14 (14.6)	21 (22)	26 (27.1)	4 (4.1)	5 (5.2)	3 (3.1)	3 (3.1)	96 (100)
Casual labour	25 (15.6)	23 (14.4)	46 (28.7)	47 (29.4)	6 (3.7)	5 (3.1)	3 (2)	5 (3.1)	160 (100)
Businessmen	3 (12)	2 (8)	3 (12)	5 (20)	2 (8)	4 (16)	3 (12)	3 (12)	25 (100)
Govt. Employment	-	-	4 (50)	1 (12.5)	1 (12.5)	-	1 (12.5)	1 (12.5)	8 (100)
Private Employment	-	-	2 (18.2)	1 (9.1)	2 (18.2)	3 (27.2)	1 (9.1)	2 (18.2)	11 (100)
Total	**47 (15.6)**	**39 (13)**	**76 (25.3)**	**80 (66.7)**	**16 (5.3)**	**17 (5.7)**	**11 (3.7)**	**14 (4.7)**	**300 (100)**

Source: Computed from primary data

Note: Figures in parentheses denote percentages to the row total

Table-6 shows the occupation wise distribution of the Body Mass Index of the respondents. In case of undernourished category, the tribals shows the highest 20.8 percent of respondents under agricultural labourer category and lowest 12 percent of respondents under businessmen category while as the non tribals shows the highest 14.6 percent of respondents under agricultural labourer category and lowest 8 percent of respondents under the businessmen category. In case of normal category, the tribals shows the highest 50 percent of respondents under Govt. employment category and lowest 12 percent of respondents under businessmen category while as the non tribals shows the highest 29.4 percent of respondents under casual labourer category and lowest 9.1 percent of respondents under the private employment category. In case of overweight category, the tribals shows the highest 18.2 percent of respondents under agricultural labourer category and lowest 3.7 percent of

respondents under casual labourer category while as the non tribals shows the highest 27.2 percent of respondents under private employment category and lowest 3.1 percent of respondents under the casual labourer category. In case of obese, category, the tribals shows the highest 12.5 percent of respondents under Govt. employment category and lowest 2 percent of respondents under casual labour category while as the non tribals shows the highest 18.2 percent of respondents under private employment category and lowest 3.1 percent of respondents under the casual labourer category.

Table-7
Income-Wise Distribution of the Body Mass Index of the Respondents

Income level (in Rs.)	Body Mass Index								Total
	Undernourished (<18.4)		Normal (18.5-22.9)		Overweight (23-24.9)		Obese (>25)		
	Tribal	Non Tribal	Tribal	Non Tribal	Tribal	Non Tribal	Tribal	Non Tribal	
Below- 25000	22 (19.6)	17 (15.2)	27 (24.1)	30 (26.8)	5 (4.5)	6 (5.3)	2 (1.8)	3 (2.7)	112 (100)
25001-50000	16 (18.6)	14 (16.3)	22 (25.6)	23 (26.7)	3 (3.5)	4 (4.7)	2 (2.3)	2 (2.3)	86 (100)
50001-75000	8 (12.5)	6 (9.4)	18 (28.1)	17 (26.5)	4 (6.3)	6 (9.4)	2 (3.1)	3 (4.7)	64 (100)
Above -75000	4 (10.5)	2 (5.3)	9 (23.7)	8 (21.1)	3 (7.9)	5 (13.1)	3 (7.9)	4 (10.5)	38 (100)
Total	**50 (16.6)**	**39 (13)**	**76 (25.3)**	**78 (26)**	**15 (5)**	**21 (7)**	**9 (3)**	**12 (4)**	**300 (100)**

Source: Computed from primary data

Note: Figures in parentheses denote percentages to the row total

Table-7 shows the income wise distribution of the Body Mass Index of the respondents. In case of undernourished category, the tribals shows the highest 19.6 percent of respondents under Below-Rs. 25000 income category and lowest 10.5 percent of respondents under the Above- Rs. 75000 income category while as the non tribals shows the highest 16.3 percent of respondents under Rs. 25001-50000 category and lowest 5.3 percent of respondents under the Above- Rs. 75000 category. In case of normal category, the tribals shows the highest 28.1 percent of respondents under Rs. 50001-75000 income category and lowest 23.7 percent of respondents under the above- Rs. 75000 income category while as the non tribals shows the highest 26.8 percent of respondents under Rs. 50001-75000 category and lowest 21.1 percent of respondents comes under the above -75000 income level. In case of overweight category, the tribals shows the highest 7.9 percent of respondents above-Rs. 75000 income category and lowest 3.5 percent of respondents under the under the Rs. 25001-50000 income category while as the non tribals shows the highest 13.1 percent of respondents under above-Rs. 75000 income category and lowest 4.7 percent of respondents comes under the Rs. 25001-50000 income level. In case of obese category, the tribals shows the highest

7.9 percent of respondents above Rs. 75000 income category and lowest 1.8 percent of respondents under the under the below- Rs. 25000 income category while as the non tribals shows the highest 10.5 percent of respondents under above-Rs. 75000 income category and lowest 2.3 percent of respondents comes under the Rs. 25001-50000 income level.

Table-8
Per Day Calorie and Protein Content of Food Consumed by the Tribal Women

Items	Per women consumed	Perday per women consumed	Total protein content consumed	Perdayper woman consumed	Total protein content consumed	Per day per woman consumed	Per day perhead total calorie and protein content of food items consumed	
Cereals	5732.01	191.05	67374	245.8	144	4.8	Protein	11.88
Pulses	364.42	15.57	663	22.1	35.1	1.17		
Vegetables	641.17	21.42	742.2	24.74	15.9	0.53		
Fish and Flesh	390.2	13.01	780.9	26.03	66	2.2		
Snacks	906	30.2	3027.6	100.92	84	2.8	Calorie	434.67
Milk Products	539.2	17.96	254.1	8.47	8.7	0.29		
Fruits	45.73	2.55	94.5	3.15	0.9	0.03		
Chutneys	62.79	2.07	103.8	3.46	1.8	0.06		
Total	8681.52	293.83	73040.1	434.67	356.4	11.88		

Source: Computed from primary data

Table-8 shows per day calorie and protein content of food consumed by the tribal women. The total consumption of the cereals consumed per day by the tribal reproductive women was 191.05 gm and per day per women's calorie content of cereals was 245.8 gm and per day per women's protein content of cereals were 4.8 Kg/Cal. The total consumption of the pulses consumed per day by the tribal reproductive women was 15.57 gm and per day per women's calorie content of pulses was 22.1 gms and per day per women's protein content of pulses was1.17 Kg/Cal. The total consumption of the vegetables consumed per day by the tribal reproductive women was 21.42 gm and per day per women's calorie content of vegetables was 24.74 gm and per day per women's protein content of vegetables were 0.53 Kg/Cal. The total consumption of the fish and flesh consumed per day by the tribal reproductive women was 13.01 gm and per day per women's calorie content of fish & flesh was 26.03 gm and per day per women's protein content of fish & flesh were 2.8 Kg/Cal. The total consumption of the snacks consumed per day by the tribal reproductive women was 30.2 gm and per day per women's calorie content of snacks was 100.92 gm and per day per women's protein content of snacks were 2.8 Kg/Cal. The total consumption of the milk & milk products consumed per day by the reproductive tribal women was 17.96 gm and per day

per women's calorie content of milk & milk products was 8.47 gm and per day per women's protein content of milk & milk products were 0.29 Kg/Cal. The total consumption of the Fruits products consumed per day by the tribal reproductive women was 2.55 gm and per day per women's calorie content of fruits was 3.15 gm and per day per women's protein content of fruits were 0.03 Kg/Cal. The total consumption of the Chutneys products consumed per day by the tribal reproductive women was 2.07 gm and per day per women's calorie content of fruits was 3.46 gm and per day per women's protein content of fruits were 0.06 Kg/Cal.

Table-9
Per Day Calorie and Protein Content of Food Consumed by the Non-Tribal Women Respondents

It ems	Per women consumed	Perday per women consumed	Total protein content consumed	Perday per woman consumed	Total protein content consumed	Per day per woman consumed	Per day perhead total calorie and protein content of food items consumed	
Cereals	9827.08	327.56	12414.3	413.81	373	9.1	Protein	14.99
Pulses	506.97	16.9	345.3	11.51	20.1	0.67		
Vegetables	500.0	16.66	651	21.7	14.7	0.49		
Fish and Flesh	365.12	12.16	579.3	19.31	52.2	1.74		
Snacks	825	27.5	2767.2	92.24	81	2.7	Calorie	572.09
Milk Products	367.43	12.23	172.2	5.74	5.7	0.19		
Fruits	69.61	2.32	90.3	3.01	0.6	0.02		
Chutneys	83.33	2.77	143.1	4.77	2.4	0.08		
Total	12544.54	418.1	17162.7	572.09	549.7	14.99		

Source: Computed from primary data

Table-9 shows per day calorie and protein content of food consumed by the non-tribal women. The total consumption of the cereals consumed per day by the non-tribal reproductive women was 327.56 gm and per day per women's calorie content of cereals was 413.81 gm and per day per women's protein content of cereals were 9.1 Kg/Cal. The total consumption of the pulses consumed per day by the reproductive non-reproductive women was 16.19 gm and per day per women's calorie content of pulses was 11.51 gm and per day per women's protein content of pulses were 0.67 Kg/Cal. The total consumption of the vegetables consumed per day by the non-tribal reproductive women was 16.66 gm and per day per women's calorie content of vegetables was 21.7 gm and per day per women's protein content of vegetables were 0.49 Kg/Cal. The total consumption of the fish and flesh consumed per day by the non-tribal reproductive women was 12.16 gm and per day per women's calorie content of fish & flesh was 19.31 gm and per day per women's protein content of fish & flesh were 1.74 Kg/Cal. The total consumption of the Snacks consumed per

day by the non-tribal reproductive women was 27.5 gm and per day per women's calorie content of snacks was 92.24 gm and per day per women's protein content of snacks were 2.7 Kg/Cal. The total consumption of the milk & milk products consumed per day by the non-tribal reproductive women was 12.23 gm and per day per women's calorie content of milk & milk products was 5.74 gm and per day per women's protein content of milk & milk products were 0.19 Kg/Cal. The total consumption of the fruits products consumed per day by the non-tribal reproductive women was 2.55 gm and per day per women's calorie content of fruits was 3.15 gm and per day per women's protein content of fruits were 0.03 Kg/Cal. The total consumption of the chutneys products consumed per day by the non-tribal reproductive women was 2.77 gm and per day per women's calorie content of fruits was 4.77 gm and per day per women's protein content of fruits were 0.08 Kg/Cal.

From the above tables (8 and 9), the sample respondent's consumption of various food items were converted into calorie and protein per day consumption of various food items and their calorie and protein contents were found out by using ICMR tables-Nutrient requirements and Recommended Dietary Allowances for Indians: a report of the expert group of the Indian Council of Medical Research, National Institute of Nutrition, Hyderabad. When comparing the food items of both the tribal and the non-tribal reproductive women, the non-tribal reproductive women consume more food than the tribal reproductive women in the study area.

Table-10
Per Day Average Intake of Food by Tribal Women

Items	ICMR (norms)	Food Intake of reproductive women	Deficit	Food intake of pregnant women	Deficit	Food intake of lactating women	Deficit
Cereals	440	340	100	347	93	370	70
Pulses	45	14	31	15	30	12	33
Vegetables	100	20	80	25	75	26	74
Fish and Flesh	30	10	20	11	19	11	19
Snacks	50	20	30	20	30	20	30
Milk Products	30	18	12	20	10	20	10
Fruits	30	20	10	14	16	13	17
Chutneys	30	2	28	1	29	2	28

Source: Computed from primary data

Table-10 shows per day average food intake of the tribal women in the study area. According to ICMR prescribed level of food items of cereals, pulses, vegetables, fish and flesh, snacks, milk products, fruits and chutneys were 440, 45, 100, 30, 50, 30, 30 and 30 grams respectively. In case of tribal reproductive women, the deficit of food intake was 100, 31, 80, 20, 30, 12, 10 and 28 grams respectively. In case of tribal pregnant women, the deficit of food intake was 93, 30, 75, 19, 30, 10, 16, and 29 grams respectively. In case of tribal lactating women, the deficit of food intake was 70, 33, 74, 19, 30, 10, 17 and 28 respectively. Table-10 reveals that the average food intake of tribal women was unsecured in food.

Table-11

Per Day Average Intake of Food by Non-Tribal Women

Items	ICMR (norms)	Food Intake of reproductive women	Deficit	Food intake of pregnant women	Deficit	Food intake of lactating women	Deficit
Cereals	440	327	113	336	104	318	122
Pulses	45	17	28	18	27	20	25
Vegetables	100	25	75	28	72	24	76
Fish and Flesh	30	18	12	25	5	25	5
Snacks	50	18	32	20	30	22	28
Milk Products	30	20	10	22	8	20	10
Fruits	30	28	2	28	2	28	2
Chutneys	30	1	29	1	29	1	29

Source: Computed from primary data

Table-11 shows per day average food intake of the non-tribal women in the study area. According to ICMR prescribed level of food items of cereals, pulses, vegetables, fish and flesh, snacks, milk products, fruits and chutneys were 440, 45, 100, 30, 50, 30, 30 and 30 grams respectively. In case of non tribal reproductive women, the deficit of food intake was 113, 28, 75, 12, 32, 10, 2 and 29 grams respectively. In case of non tribal pregnant women, the deficit of food intake was 104, 27, 72, 5, 30, 8, 2 and 29 grams respectively. In case of non tribal lactating women, the deficit of food intake was 122, 25, 76, 5, 28, 10, 2 and 29 respectively.

Table-12

Category Wise Awareness of Nutritional Programmes of the Respondents

Category	Awareness of Nutritional Programmes			Total
	No	**Average**	**High**	
Tribal	67 (44.7)	55 (36.7)	28 (18.6)	150 (100)
Non tribal	23 (15.3)	40 (26.7)	87 (58)	150 (100)
Total	**80 (30)**	**95** (31.7)	**114** (38.3)	**300** (100)

Source: Computed from primary data

Note: Figures in parentheses denote percentages to the row total

Table-12 shows the category wise awareness of nutritional programmes. In case of no awareness of nutritional programmes category, 44.7 percent were tribals and 15.3 percent were non tribals. In case of average awareness of nutritional programmes category 36.7 percent were tribals and 26.7 percent were non tribals. In case of high awareness of nutritional programmes category, 18.6 percent were tribals and 58 percent were non tribals.

Table-13
Educational Wise Family Planning Methods Adopted by the Respondents

Educational levels	Family Planning Methods								Total
	No Planning		Oral		LUV		Sterilization		
	Tribal	Non Tribal	Tribal	Non Tribal	Tribal	Non Tribal	Tribal	Non Tribal	
Illiterate	55 (34.3)	19 (11.8)	18 (11.2)	25 (15.6)	11 (7)	20 (12.5)	3 (2)	9 (5.6)	160 (100)
Primary	17 (21.5)	10 (12.7)	11 (14)	13 (16.4)	6 (7.6)	14 (17.7)	2 (2.5)	6 (7.6)	79 (100)
Secondary	6 (16.2)	3 (8.1)	5 (13.5)	7 (19)	3 (8.1)	7 (19)	2 (5.4)	4 (10.7)	37 (100)
Higher Secondary	2 (13.3)	1 (6.7)	2 (13.3)	2 (13.3)	2 (13.4)	3 (20)	1 (6.7)	2 (13.3)	15 (100)
Graduation & above	1 (11.1)	-	1 (11.1)	2 (22.2)	1 (11.1)	2 (22.3)	1 (11.1)	1 (11.1)	9 (100)
Total	**81** (27)	**33** (11)	**37** (12.3)	**49** (16.3)	**23** (7.7)	**46** (15.3)	**9** (3)	**22** (7.3)	**300** (100)

Source: Computed from primary data
Note: Figures in parentheses denote percentages to the row total

Table-13 shows the education wise family planning methods adopted by the respondents. In case of No Planning category, the tribals shows the highest 34.3 percent of respondents under illiterates and lowest 11.1 percent of respondents under the graduation & above level while as the non tribals shows the highest 12.7 percent of respondents under primary level and lowest 6.7 percent of respondents under the higher secondary level. In case of Oral family planning method, the tribals shows the highest 14 percent of respondents under primary level and lowest 11.1 percent of respondents under the graduation & above level while as the non tribals shows the highest 22.2 percent of respondents under graduation & above level and lowest 13.3 percent of respondents under the higher secondary. In case of LUV family planning method, the tribals shows the highest 13.4 percent of respondents under higher secondary level and lowest 7 percent of respondents under illiterates while as the non tribals shows the highest 22.3 percent of respondents under graduation & above level and lowest 12.5 percent of respondents under illiterates. In case of Sterilization family planning method, the tribals shows the highest 11.1 percent of respondents under graduation & above level and lowest 2 percent of respondents under illiterates while as the non tribals shows the highest 13.3 percent of respondents under higher secondary level and lowest 5.6 percent of respondents were illiterates.

Table-14

Income levels and Place of Deliveries of the Respondents

Income level (In Rs.)	Place of Delivery						Total
	Home		PHC & GH		Private Hospital		
	Tribal	Non Tribal	Tribal	Non Tribal	Tribal	Non Tribal	
Below- 25000	41 (36.6)	22 (19.6)	21 (18.7)	16 (14.3)	2 (1.8)	10 (9)	112 (100)
25001-50000	26 (30.2)	12 (14)	18 (21)	17 (19.7)	2 (2.3)	11 (12.8)	86 (100)
50001-75000	16 (25)	6 (9.4)	16 (25)	13 (20.3)	3 (4.7)	10 (15.6)	64 (100)
Above -75000	7 (18.4)	3 (7.9)	11 (29)	6 (15.8)	3 (7.9)	8 (21)	38 (100)
Total	**90** (30)	**43** (14.3)	**66** (22)	**52** (17.3)	**10** (3.4)	**39** (13)	**300** (100)

Source: Computed from primary data

Note: Figures in parentheses denote percentages to the row total

Table-14 shows the income wise place of the delivery of the respondents. In case of home deliveries, the tribals shows the highest 36.6 percent of respondents under below-Rs 25000 income level and lowest 18.4 percent of respondents under the above Rs. 75000 income level while as the non tribals shows the highest 19.6 percent of respondents under below-Rs 25000 income level and lowest 7.9 percent of respondents under the below-Rs 25000 income level. In case of PHC & GH deliveries, the tribals shows the highest 29 percent of respondents under above- Rs. 75000 income level and lowest 18.7 percent of respondents under the below-Rs. 25000 income level while as the non tribals shows the highest 20.3 percent of respondents under Rs. 50001-75000 income level and lowest 14.3 percent of respondents under the below-Rs 25000 income level. In case of private hospital deliveries, the tribals shows the highest 7.9 percent of respondents under above Rs. 75000 income level and lowest 1.8 percent of respondents under the below-Rs. 25000 income level while as the non tribals shows the highest 21 percent of respondents under above-75000 income level and lowest 9 percent under the below-25000 income level.

Table-15

Educational level and Vaccination Scores of the Respondents

ucationallevels	Vaccination scores						Total
	Low(No)		Medium (Two times)		High (Three times)		
	Tribal	Non Tribal	Tribal	Non Tribal	Tribal	Non Tribal	
Illiterate	62 (38.7)	43 (27)	23 (14.3)	11 (7)	14 (8.7)	7 (4.3)	160 (100)

Primary	9 (11.3)	15 (19)	17 (21.5)	23 (29.1)	4 (5.1)	11 (14)	79 (100)
Secondary	3 (8.1)	5 (13.5)	4 (10.8)	7 (19)	5 (13.5)	13 (35.1)	37 (100)
Higher Secondary	1 (6.7)	1 (6.7)	1 (6.6)	2 (13.3)	3 (20)	7 (46.7)	15 (100)
Graduation & above	-	-	2 (22.2)	2 (22.2)	2 (22.2)	3 (33.4)	9 (100)
Total	**75** (25)	**64** (21.3)	**47** (15.7)	**45** (15)	**28** (9.3)	**41** (13.7)	**300** (100)

Source: Computed from primary data

Note: Figures in parentheses denote percentages to the row total

Table-15 shows the education level and vaccination scores of the respondents. In case of low vaccination scores, the tribals shows the highest 38.7 percent of respondents under illiterates and lowest 6.7 percent of respondents under the higher secondary level while as the non tribals shows the highest 27 percent of respondents were illiterates and lowest 6.7 percent under the higher secondary level. In case of medium vaccination scores, the tribals shows the highest 22.2 percent of respondents under primary level and lowest 6.6 percent of respondents under the higher secondary level while as the non tribals shows the highest shows the highest 29.1 percent of respondents under primary level and lowest 7 percent of respondents under illiterates. In case of high vaccination scores, the tribals shows the highest 22.2 percent of respondents under graduation & above level and lowest 5.1 percent of respondents under the Primary level while as the non tribals shows the highest 46.7 under higher secondary level and lowest 4.3percent of respondents under the illiterates.

Table-16
Awareness of Family Planning Programmes and Time Interval between Deliveries

Time Interval between deliveries	Awareness of Family Planning Programmes						Total
	No		Average		High		
	Tribal	Non Tribal	Tribal	Non Tribal	Tribal	Non Tribal	
Low	24 (35.3)	14 (20.6)	7 (10.3)	10 (14.7)	5 (7.3)	8 (11.8)	68 (100)
Medium	45 (30)	20 (13.2)	24 (16)	26 (17)	13 (8.6)	23 (15.2)	151 (100)
High	7 (8.4)	10 (12.3)	17 (21)	19 (23.4)	8 (10)	20 (24.7)	81 (100)
Total	**76** (25.3)	**44** (14.7)	**48** (16)	**55** (18.3)	**26** (8.7)	**51** (17)	**300** (100)

Source: Computed from primary data

Note: Figures in parentheses denote percentages to the row total

Table-16 shows the awareness of family planning programmes and the time interval between deliveries of the respondents. In case of No awareness of family planning programmes category the tribals shows the highest 35.3 percent of respondents under low interval between deliveries and lowest 8.4 percent of respondents under the high interval between deliveries while as the non tribals shows the highest 20.6 percent of respondents low interval between deliveries and lowest 12.3 percent of respondents under high interval between deliveries. In case of average awareness of family planning programmes the tribals shows the highest 21 percent of respondents under high interval between deliveries and lowest 10.3 percent of respondents under the low interval between deliveries while as the non tribals shows the highest 23.4 percent of respondents under high Interval between deliveries and lowest 14.7 percent of respondents under low interval between deliveries. In case of high awareness of family planning programmes the tribals shows the highest 10 percent of respondents under high interval between deliveries and lowest 7.3 percent of respondents under the low interval between deliveries while as the non tribals shows the highest 24.7 percent of respondents under high interval between deliveries and lowest 11.8 percent of respondents under low interval betweendeliveries.

FINDINGS:

1. It was found that in case of tribal reproductive women, the mean height was 5.54 inches, mean weight was 60.69 Kg and mean BMI was 21.37 while as in case of non tribal reproductive women, the mean height was 5.61 inches, mean weight was 62.08 Kg and mean BMI was 21.28.

2. It was found that in case of tribal reproductive women the BMI was higher 22.69 in above-47 year age group and lower 19.47 in the 28-37 years age group while as in case of non tribal reproductive women, the BMI was found to be higher 21.82 in above-47 years age group and lower 20.83 in the 28-37 years age group.

3. It was found that in case of tribal reproductive women, the majority of the respondents 20.8 percent were undernourished belongs to agricultural labourers category and lowest 12 percent of the respondents belongs to business category while as in case of non tribals the majority of the respondents 14.6 percent were undernourished belongs to agricultural labourers category and lowest 8 percent of the respondents belongs to business category.

4. It was found that in case of tribal reproductive women, the majority of the respondents 20 percent were undernourished belongs to illiterates and lowest 6.7 percent of the respondents belongs to higher secondary level while as in case of non tribals the majority of the respondents 15.2 percent were undernourished belongs to primary level and lowest 6.7 percent of the respondents belongs to higher secondary level.

5. It was found that in case of tribal reproductive women, the majority of the respondents 21 percent were undernourished under the 18-27 years age group and lowest 13 percent of the respondents belongs to the above-47 years age group while as in case of non tribals the majority of the respondents 16.1 percent belongs to undernourished under the 18-27 years age group and lowest 8 percent of the respondents belongs to above- 47 years age group.

6. It was found that both tribal and non tribal reproductive women show deficiency in consumption of cereals, pulses, green leafy vegetables, fish and flesh, milk and milk

products, fruits, snacks and chutney while compared with ICMR Recommended level. This shows the nutritional insecurity of both the tribal and non tribal reproductive women. It was also found that tribal reproductive women suffered more due to PEM (Protein-Energy Malnutrition) in the study area.

7. It was found that the rate of food consumption was quite low among the tribal reproductive women while the rate of food consumption was quite high among the non tribal reproductive women.

8. In general, the non tribal reproductive women shows relatively high level of health status, indicating their physical, mental and social well being consequent upon good socio-economic conditions while as the tribal reproductive women shows low level of health status. The low health status is quite common among tribal reproductive women, consequent upon low socio-economic status.

9. It was also found that low income capacity to make use of available health care facilities and services in the tribal reproductive women and they have low user fee paying capacity for health care services. In general, illiterate and primary level educated women have low health consequent upon lack of awareness about health care practices. Usually they belong to the poor households, so, they are not able to take required nutritionaland health care practices.

10. It could be observed that women from the highest income group mainly have high health status, consequent upon taking adequate nutritional and health care practices while as the women from low income group have low health status. This is due to taking inadequate nutritional and health care practices.

11. It was also found that in case of tribal reproductive women, 44.7 percent of the respondents have no awareness about nutritional programmes while in case of non tribal reproductive women only 15.3 percent respondents have no awareness about the nutritional programmes.

12. It was also found that in case of tribal reproductive women, 30 percent of the deliveries takes place at home while as in case of non tribal reproductive women only 14.3 percent of respondents have their deliveries at home.

POLICY SUGGESTIONS:

1. Given the higher concentration of tribal population in the geographically remote, inaccessible and rough terrains with limited access to drinking water facilities, there is a vital need for schemes like small watershed and percolation tanks in the dry or water scarcity parts of the study area should be constructed to improve the basic necessities of life among tribal population.

2. There is a vital need for mass education program free of cost in both tribal and non tribal communities in order to raise their social and economic status. Furthermore, due importance to female education has to be accorded to increase the tribal's literacy rate and educational attainment at par with their male counterparts and tribals as a whole to minimize the tribal and the non-tribal disparities in the levels of education.

3. Given the large prevalence of under nutrition especially among the tribal reproductive women as indicated by the primary survey, there is a need for mass information, education and communication in the tribal communities in order to increase their awareness about

intake of proper nutrient rich food during the pregnancy and child bearing. We also argue for the improvement of affordable, accessible and quality health care services in the tribal communities with proper follow-up in order to raise the general nutritional and health status of the tribal population.

4. The primary health centre is not located in the study region and people spend more money for private health sources, so the Government should provide new hospital and medical facilities in the study area.

5. The government can strengthen the household capacity to access food through public food distribution, food price stabilization and food for work programmes.

6. Finally, the Government of India should repeatedly take steps to strengthen preventive health care services in addition to the provision of easy treatment for delivery and emergency services. The nutritional status of the tribal women was quite low. Hence there is a need to increase nutritional status of the tribal reproductive women with the support of IRDP.

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