

Health and Nutritional Status of Munda Women in Mayurbhanj District, Odisha

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Abstract

The present paper is based on nutritional status of Munda women, those are living in forested zone as indigenous people specifically defined as "a politically underprivileged group, who share a similar ethnic identity different from the majority people, and who have been an ethnic entity in the locality before the present culture or society came into existence".

The physical condition of the body in those respects influenced by the diet and the levels of nutrients in the body and the ability of those levels to maintain normal metabolic integrity is considered as nutritional status. In this connection the present study is carried out in Shyamakhunta block of Mayurbhanj district, to assess the nutritional status of 428 married women from four sample villages, particularly between age group 15–49 and special emphasis has given to bring clear nutritional status of pregnant and non-pregnant women, general adequacy is assessed by measuring weight and height; the result is commonly expressed as the body mass index, the ratio of weight (kg) to height² (m). Status with respect to individual food pattern has measured to determine the nutritional status of women for specific metabolic responses.

The objectives of the study are framed as (i) to determine the nutritional status of pregnant and non-pregnant Munda women with the BMI status (ii) to examine whether there exists any difference in the nutritional status of pregnant and non-pregnant tribal women due to the level of income of their family; (iii) To examine whether there exists any difference in the health and nutritional status of Pregnant and Non-pregnant tribal women due to the level of education, i.e., illiterate and literate; (iv) It aims to examine the inter-relationship between the food habit and calorie intake of the pregnant and non-pregnant women in the study area.

Keywords: Tribe; Munda Women; Income; Nutritional Status; BMI.

Introduction

Nutrition is the main factor to energize the human body to perform various functions and to lead a healthy life. The nutrients include proteins, fat, carbohydrate, vitamins and minerals. These nutrients are chemical substances which are present in the food we eat daily. The foods containing these nutrients which we consume daily are classified as cereals, pulses, nuts and oil seeds, vegetables, fruits and milk

products and flesh food (It keeps the body healthy and to create immune power and sustain in work activities to generate income. Health is a prerequisite for human development and is an essential component for the well being of the mankind as a whole. It is a fact that the health problems of any community are influenced by interplay of various factors including social, economic and political ones. Also, the common beliefs, customs, practices adopted by any community related to health and disease in turn influence the health seeking behavior of that

community to a greater extent. There is a consensus agreement among all those experts who are engaged in the health and nutritional studies and experiments that the health status of the tribal population is very poor and, more particularly, worst among the primitive tribes because of their isolation, remoteness and for the fact that they are being largely unaffected by the developmental processes going on in the country.

It is highlighted in the book "Nutritive value of Indian food" that there are serious deficiencies in the diets of our population particularly among the poor. As a consequences of this dietary deficiency, several nutritional deficiencies with clinical manifestations and disabilities are encountered in our country namely, (i) protein energy malnutrition among pre-school children, (ii) Vitamin-A deficiency among children, (iii) Iron deficiency anemia in all groups, particularly among women, children and pregnant women, (iv) Iodine deficiency-endemic goiter, (v) B-complex deficiency. These diseases, if untreated or not prevented, may lead to many disabilities. Protein Energy Malnutrition (PEM) results in poor growth and development among Children. Vitamin-A deficiency when it becomes severe leads to nutritional blindness. Anemia leads to impaired work capacity, impaired resistance to infection and poor pregnancy outcome. Goiter due to iodine deficiency results in thyroid insufficiency, impaired metabolism and mental retardation. It is happening due to inadequate and faulty diets.

The ICMR study has indicated a high incidence of malnutrition in the tribal dominated districts of Orissa, in spite of the fact that Orissa is one of the ten states in the country covered under the National Nutrition Monitoring Bureau (NNMB). According to the report of NNMB (2000–2001), Orissa continues to have second highest level of under-nutrition among the ten states. When compared with the aggregate figures for chronic energy deficiency (BMI <18.5) in adult men and women in these states the level is higher in our state.

After analyzing the entire health scenario and the types of health problems faced by the tribes of the state, the ICMR Report concludes that the primitive tribes of Orissa and their health scenario presents a kaleidoscopic mosaic of various communicable and non-communicable disease profile keeping in pace with their socio-economic development. Among these studied tribes, there are communities who still depend primarily on hunting and food gathering as primary source of livelihood. The wide spread poverty, illiteracy, malnutrition, absence of safe drinking water and sanitary conditions, poor maternal and child

health services, ineffective coverage of national health and nutritional services, etc. have been found, as possible contributing factors of dismal health condition prevailing amongst the primitive tribal communities of the country. Some of the intervention programs can be included in the national programs also. Besides this, the Bulletin also indicates that the non-communicable diseases like diabetes and hypertension are conspicuously absent among those tribes which indicates the fact that the primitive tribal communities of the State are still far away from the modern civilization and developments. In spite of the tremendous advancement in the field of preventive and curative medicine, the health care delivery services in these primitive tribal people are still at a very poor state and as per the ICMR Report- an all out effort is needed to strengthen these services so that the 'Health for All' goal in the country can be achieved.

A cross-sectional study has undertaken to determine anthropometric profile and nutritional status based on body mass index (BMI) of Munda women, a tribal population of Mayurbhanj district, Orissa. A total of 428 adult (aged > 15years) Mundas of four villages of Shyamakhunta block, Mayurbhanja District, Orissa, were studied. Anthropometric measurements including height, weight, as well as BMI were measured. In conclusion, this study demonstrated that the prevalence of adult under nutrition was found to be very high among the Munda women, a tribal of Mayurbhanj District, Orissa. These rates were much higher than those found in several tribal populations from other parts of India. Therefore, immediate nutritional intervention programs are needed for implementation among Munda women moreover, further research is needed not only among this ethnic group but also other tribal populations of India to fully understand the causes and consequences of adult under nutrition.

Review of earlier studies

Different reviews and analyses of the literatures had helped to overcome various obstacles and pitfalls which might arise during the course of the work. Moreover, the review of previous literature helps in generating new ideas, theories and hypotheses those are very much required for a better analysis, which can result in a useful innovative model which can be utilized by the society, nation or the common man. Thus, review of related literature assumes a greater significance in designing and planning the study and it also helps in minimizing the errors arising out of various risks associated with a research design.

Hence, the time spent and the amount of effort put on this exacting task is always considered as a wise and gainful investment for any good researcher. All those materials reviewed were collected from various libraries of various universities and institutions, maintained by various organizations. A skeletal representation of some useful research works and studies are presented below for the reference of the study.

Varma G.R et.al (2011) in their article "Antenatal care service utilization in tribal and rural areas in a South Indian context : an evaluation through mixed methods approach" have highlighted the utilization of ante natal care services by women living in tribal areas in the district of Visakhapatnam, Andhra Pradesh. Quantitative data on ANC were collected from women having a child aged less than a year. The study reports higher utilization of ANC compared with the national average of India. A greater proportion of women living in tribal areas utilize the services from governmental sources, 92 per cent women as approximately 54 per cent of rural women seek services (paid services) from private practitioners. The study showed relatively higher utilization of ANC services than the national average but at the same time, child deliveries at home which were mostly conducted by untrained elderly women were also high. In addition the literacy levels of women, socio-economic conditions and distance to the health facilities also played a role.

Goswami et.al (2011) in their article "Traditional method of Reproductive Health Care Practices and Fertility among the Bhumija Tribe of Baleswar, Orissa" makes an attempt to focus on the traditional medicine used by the Bhumijas of Baleswar district for reproductive health problems and fertility control. The study reveals eight plant species are being used as traditional medicines to cure. The village medicine man, who has a good knowledge about the herbal medicines usually treat the patients. Many elderly persons and experienced women of the village who attend the deliveries are also aware of the importance and use of such herbal medicines. It is found that though the traditional reproductive health service is generally affordable and easy to access yet the younger generation is getting influenced by the modern medicine. Further due to the process of urbanization and culture contact there is always a threat to the indigenous knowledge.

Chauhan, P et.al (2011) have highlighted the maternal mortality in the tribal region of Bastar district of Chattisgarh state and their relation to age, education, occupation and socio-economic status of the diseased mothers. A majority of maternal mortality

93(78.14 %) was noticed in age group between 19 and 35 years. A majority of patients had a low education status. Out of 119, only 1 per cent was educated up to 11th class, 8 per cent were up to class 10. The chief cause was found to be unhygienic and primitive practices for parturition, low education and socio-economic status. From the inception of pregnancy to its termination, no specific nutritious diet is consumed. The habit of taking alcohol during pregnancy has been found and continues their regular activities including hard labor during advanced pregnancies. A majority of deliveries are conducted at home attended by elderly ladies of the household which resulted in an increased susceptibility to various infections.

Goswami et.al (2009) in their article "Reproductive performance of the Bhumija women: An empirical study of a Tribal village, Balasore, Orissa" have described about the reproductive performance of the Bhumija women of a tribal village of Balasore district, Orissa. She has also described the factors affecting fertility, such as age at marriage, family planning practices, etc. Average number of conception, average life birth, uterine wastage and surviving offspring's are considered as reproductive measures. The study reveals that the mean age at first child birth is 18.14 year. There is less number of uterine wastage and post natal death. The average number of conception per women is 3.87 and live births per woman are 3.28, pre partum reproductive loss is 0.13 and post natal loss is 0.10.

Acharya, A (2008) in his article "Access and Utilization of Health Care Services in urban low-income settlements in Surat, India", has described about the various programs like ICDS, NRHM and its implication in reality. He has also described that the socio-economic status like sex ratio, education, income of people acts as the influential indicators of health services. In his study the accessibility to electricity, toilet, drinking water and other minimum facilities are well evaluated. The health care seeking behavior and health expenditure of the sample population are also analyzed. Besides this, various aspects of preventive health care services like reproductive health care facilities, anti-natal checkups, delivery expenditures, awareness and use of contraceptives, enculturation, and immunization of the children and use of ORS etc. are also carefully studied by the author.

Acharya, S (2007) in her article "Health, Disease and Indigenous Health Care system among the Munda-A Primitive Tribe of Orissa" has made an attempt to investigate different systems of indigenous medical practices including the concept of illness and

diseases, ethno medicine used for treatment and cure of different diseases. She also studied different indigenous methods of preservation, identification of herbs and plants used in medicine and the attitude of people towards the use of modern medicine with the background of traditional tribal health care system.

Panda, P and et.al (2007) in an article "Health status of Tribal in India: Evidence from Andhra Pradesh" has made a modest attempt to critically evaluate the health status of tribal women and children in Andhra Pradesh on the basis of different determinants and health indicators. The indicators chosen are provision of sanitary and drinking water facilities, mortality and morbidity, fertility and family planning, diet and nutritional status of tribal women and children and their access to different forms of health care services. The study shows that the health status of tribal population in Andhra Pradesh is better when compared with average health scenario of Indian tribal, but it is not satisfactory when it is compared with the non tribal population of Andhra Pradesh. There exists a wide gap in the health indicators between tribal and non tribal areas which is mainly due to uneven provision and utilization of health care services at the both areas. Infant mortality and maternal mortality are very high among the tribal's. Tribal prefer more to traditional form of medicines and practices than the health care facilities available in private run clinics and PHCs for healing their diseases.

Patra, R (2007) in an article "Health Care Delivery System in Orissa" has made an attempt to analyze the health care delivery system prevalent in our state. Besides these, he also examines the issues of accessibility to the health services along with its financing aspects. He has also done an extensive as well as intensive study of two health related programs of government of Orissa, i.e. "Bare Foot Doctors", "Panchabyadhi Chikitsa Vyabastha" which is being implemented by the Government of Orissa for the improvement

Kaushik Bose and Falguni Chakraborty (2011) found that the high rate of under nutrition among adult Bathudis could have severe health implications. Further-more, there is an urgent need for further studies to ascertain the relationship of this high rate of under nutrition with morbidity and mortality among this ethnic group. Similar studies should also be undertaken among other tribal populations in India since they constitute a sizeable portion of India's population. Moreover, since under-nutrition has several underlying causes, future investigations should aim at identifying the likely cause(s) of high

rates of under nutrition among Indian tribal populations.

Nayak, Ajanta (2007), observed that the Body Mass index (BMI) made above indicates the factor which really influences the health and nutritional status of the Munda women children within the age group of 6 to 14 years. In addition to this to assess the exact level or standard of nutrition status of those children, the researcher has also used the dietary assessment method. Through this method the average dietary intake -in terms of cereals, pulses etc. of those sample children were computed and the deficit/surplus in the dietary supplement of a child was calculated with the help of the standardized or recommended dietary allowances for a normal adolescent children which is developed by the Indian Council of Medical Research (ICMR).

Methodology

The study adopted various anthropological methods like in depth interviews, observation and focused group discussion. The study adopts a purposive random sampling method by which the sample block and the sample villages are being selected. The component of the study is the Munda married women with pregnant and non-pregnant (15-49 years of age) in the family whose response are being critically examined. From one household one woman is selected. Four hundred twenty eight women sample chosen for the study on a random method and have listed the household first and used Tippets table and have selected every fifth household. Again the selection is made till we get 428 samples. Beyond these factors income, education, food pattern, calorie intake and BMI status of the women have been taken into consideration which are critically important for implementing any new policy or program for the improvement of health aspect of the tribe and in turn all the people.

Body mass index (BMI), computed using the following standard equations: $BMI (kg/m^2) = Weight (kg) / height (m)^2$. Nutritional status was evaluated using internationally accepted World Health Organization (WHO) BMI guidelines. The following cut-off points are used: Under Nutrition: $BMI < 18.5$, Normal: $18.5 \leq BMI < 25.0$, over weight: $BMI \geq 25.0$. Means and standard deviations of all anthropometric variables and indices were computed. Standard Deviation, mean have been utilized to compute differences in nutritional status.

Objectives

The aims and objectives of the study are framed as:

- To determine the nutritional status of pregnant and non-pregnant Munda women with the BMI status.
- To examine whether there exists any difference in the nutritional status of pregnant and non-pregnant tribal women: *due to the level of income of their family.*
- To examine whether there exists any difference in the health and nutritional status of pregnant and non-pregnant tribal women: *due to the level of education, i.e., illiterate and literate.*
- Further, it aims at examining the interrelationship among the food habits and calorie intake of the pregnant and non-pregnant Munda women in the study area.

Area and People under study

Mayurbhanj is one of the thirty districts of Orissa, which spreads over an area of 10,418 sq km. The district accounts for 6.69 per cent of the total land mass of Orissa and hence the district is regarded as the largest among the 30 districts of the state. The district lies between 85 40'E and 87 11'E longitude and 21 and 23 N latitude. It is a land locked district which is bounded by Jharkhand and West Bengal state on the north, Keonjhar and Balasore districts of Orissa on the south, West Bengal and Balasore on the east and Keonjhar district of Orissa and Jharkhand state located on the west of the district. The history of

the formation of the district can be traced back to a thousand years back when it was ruled by the Mayurs and the Bhanjas. In accordance with the signing of the instrument of Merger, this princely state became a part of the Indian Union on November 9, 1948. It was the last feudatory state to be annexed with Orissa in January, 1949 which is a border district located in the northern part of the state and is dominated by tribal.

As per the estimation there are around two millions of Munda People living in our country. Since the pre-independent India, this tribe is one among the highly respected tribes in our country. Among these tribal people, Birsa Munda, who turned to be a Prophet, is the most respected and revered one who has fought for the freedom of India. Even today his contribution to the Independence of India is recognized with high regard. The Munda tribe speaks a language which is called as *Mundari*. This language belongs to the Munda sub group of the Austro-Asiatic language family and formed into one of the Indigenous Peoples of the Indian sub-continent. Normally, the Munda identify them as "*Hodoko*" which means "Human Beings". The Munda People have been living in the same region for quite a long time, considering it their home from birth to death.

Health and Nutrition

The nutritional status in the district is grossly inadequate in terms of the minimum requirements of the people. As per the data collected in the district, there are 589 sub centers to provide nutritional food through Substantial Nutrition Program (SNP) to the indoor pregnant women. Besides the pregnant

Table1: Health care indicators of mayurbhanj district

Primary Indicators	Orissa	Mayurbhanj
Infant Mortality Rate	71	59
Maternal Mortality Rate	303	207
Neo-natal Mortality Rate	44	40.9
Under 5 Mortality Rate	87	14.5
Total Fertility Rate	2.4	2.26
Contraceptive Prevalence Rate	49.0	37.1
Marriage and Fertility		
Percentage of girl's marrying before completing 18 years	37.5	34.0
Percentage of Births of Order 3 and above	20.4	40.5
Sex Ratio at birth	110	119
Percentage of women age 20-24 reporting birth of order 2 & above	51.0	39.6
Percentage of births to women during age 15-19 out of total births	11.0	4.6
Maternal Health		
Mothers registered in the first trimester when they were pregnant with last live birth/still birth (%)	57.7	47.5
Mothers who had at least 3 ANC visits during the last pregnancy (%)	66.0	48.1
Mothers who got at least one TT injection when they were pregnant with their last live birth / still birth (%)	99.0	89.1
Institutional births (%)	43.0	32.4
Delivery at home & other places assisted by a doctor/nurse /LHV/ANM (%)	54.6	7.3
Mothers who received PNC within 48 hours of delivery of their last child (%)	93.5	NA

Source: DLHS -3, 2012

women, adult women are being deprived off to get nutritional food due to prevalence of acute poverty.

Thus, this gross inadequacy of nutritional food results in different disease like anemia, weak body, problem in pregnancy etc. Furthermore the mismatch between need for and availability less across regions became wider as the mobility patterns and distribution of population varies according to the regional pattern of the district. Thus, it is of no doubt that the thinly populated and rural and tribal areas are at the most disadvantageous position in comparison to other people.

To examine and analyze the current health and nutritional status of the district based on the data related to various indicators which provides the status of nutrition of the population of the district is provided in the Table -1.

An examination of the health indicators reveals that 34 % girl marry before completing 18 age, 40.5 % have 3 and above birth order and 10 % women are not taking TT injection when they were pregnant with their last live birth / still birth which indicates the low health awareness and leads to ill health and low nutritional status.

Block Profile

Shyamakhunta is one of the 26 blocks of Mayurbhanj district predominately dominated by the scheduled tribe population. The block has a total geographical coverage of 121sq.km and is located in

the central part of the district. The block is bounded by Bangiriposhi and Kuliana block in the north, Khunta and Barsahi block on the south. Similipal hills adorned the western side and Sadar block of the Mayurbhanj district is located on the east of the block. About thirty kilometers of the reserve forest area of Similipal Sanctuary is also located inside Shyamakhunta block. The block is situated 13 km far away from district head quarter, i.e., Baripada.

As per 2011 census, male population constitutes around 50.53 per cent of the total population and the rest 49.47 per cent are female. The Scheduled tribe constitutes around 64.39 per cent of the total block population and around 3.93 percent belongs to the scheduled caste category. This implies that only 31.69 per cent of the people belong to the general category. The APL/BPL data reveals that only 1.32 per cent of the people of the block belong to the APL (Above Poverty Line). This indicates that the block is predominately characterized with poverty (98.68 per cent BPL).

Health Status

The health profile of the block depicts a poor picture when compared with the scenario of the district, state and the country. The data in relation to the IMR, MMR and NNMR which are regarded as most vital and standardized health profile indicators across the globe were collected and cross-examined with the figures available with various other agencies (Table-2).

Table 2: Comparative Health Care Indicators

Sl. No	Particulars	India	Orissa	Mayurbhanj	Shyamakhunta
01	IMR	53	69	59	43.45
02	MMR	254	303	207	220.90
03	NNMR	34	47	40.9	42

Source: CDMO Office, Mayurbhanj, 2012

As per the data provided in the Table-2, the IMR of the block is estimated as 43.45 per 1000 population, MMR is 220.90 per 1000 populations and the Neo Natal Mortality Rate (NNMR) is estimated to 42. An examination of the data and the information collected through discussions with a number of health officials indicates that this low health profile is also characterized by the additional fact of a high birth rate of low birth weight babies and lack of basic post-natal care for the newborns. In addition to these, lack of access to adequate nutrition and safe drinking water mostly in the rural and backward areas are other underlying factors which contribute to the lower health status of the people of the block.

Apart from causes related to health factors, maternal deaths due to socio-cultural, economic and educational factors which have a bearing on timely and appropriate health seeking behavior also contributes to this degraded health profiles of the block. Furthermore, the availability of types of services and of special care at health care facilities are also of critical importance in regard to this lower profile related to health and health facilities.

In spite of the backwardness of the block, Shyamakhunta contributes few numbers of deaths in TB and Malaria. Public health care facilities in Shyamakhunta comprise of 21 functioning Sub-Centre, 1 PHC & 1 PHC (N) which cater to the health

needs of the people who reside in a scattered area of the block. Especially a large number of traditional healers and practitioners are present in different areas of the block and most of the people more particularly the tribal communities depend upon them for their treatment of illness. There is a under utilization of existing public health infrastructure facilities due to a combination of reasons. It has been observed that some regions suffer disproportionately in terms of lower access to health services due to the lack of availability of staff, especially the services of health specialists.

Findings and analysis

Sample Selection

A critical examination of various aspects on nutritional status of Munda women perception about a perfect health, causes of the health ailments, expenditure on treatment, income, education, expenditure, food habit, calorie intake and BMI is highly essential to understand the impact of nutritional status among married Munda women and the changes that occur in the faith, belief and practices of the Munda women over the years. In the following, the distribution of sample women presented below.

Table 3: Distribution of the Sample Munda Women/HHs selected for the Study

Village	No. of HHs	Total Munda Population	No. of Munda Women	% of sample to Total Munda women	Sample Women
Jagannathpur-1	172	1207	444	36.79	129
Jagannathpur-2	177	1219	447	36.67	133
Hinjolgodia	119	714	225	31.51	89
Kitadihi	103	590	176	29.83	77
Grand Total	571	3730	1292	34.64	428

Source: Field survey, 2012

The data presented above indicates that out of total 1292 Munda women, 428 married women (15–49 years) have selected for the study, on the other hand, about 37 % each from Jagannathpur-1 and Jagannathpur-2 village, 32% selected from Hinjolgadia village and 30% selected from Kitadihi village. All the sample women were canvassed with the well designed questionnaire and analyzed for the research purpose.

Occupation

To do any activities, healthy body and mind is essential to perform work activities for which proper nutritional needed. In this regard Occupational pattern of their and their counterpart has shown in the following table-5.

Table 4: Occupational pattern

Village	No. of HHs	Agriculture	Agricultural Labour	Non-Agricultural Labour	Business	Service	NTPF	Others
Jagannathpur-1	133	73 (54.89)	22 (16.54)	18 (13.53)	2 (1.50)	2 (1.50)	14 (10.53)	2 (1.50)
Jagannathpur-2	129	70 (54.26)	25 (19.38)	16 (12.40)	3 (2.33)	1 (0.78)	11 (8.53)	3 (2.33)
Hinjolgodia	89	18 (20.22)	21 (23.60)	22 (24.72)	2 (2.25)	2 (2.25)	21 (23.60)	3 (3.37)
Kitadihi	77	14 (18.18)	20 (25.97)	18 (23.38)	1 (1.30)	1 (1.30)	19 (24.68)	4 (5.19)
Total	428	175 (40.89)	88 (20.56)	74 (17.29)	8 (1.87)	6 (1.40)	65 (15.19)	12 (2.80)

Source: Field survey, 2012

N.B.-Figures in Parentheses represent percentage to the respective totals

It is revealed that out of total households(428), 41% engaged in Agricultural activities, 21 % engaged in Agricultural labor, 17% engaged in Non-Agricultural labor, 2 % engaged in Business, 1.4 % engaged in service and 15 % engaged in collection of NTFPs from nearby forest. Village-wise figure shows that highest 55% household in Jagannathpur-1 village involved in agricultural activities, highest 24% household in

Hinjolgodia village involved in agricultural labor, highest 25% household in Hinjolgadia village involved in Non-agricultural labor, highest 2.3% household in Jagannathpur-2 village involved in business, highest 2.2% household in Hinjolgadia village involved in service and highest 25 % household in Kitadihi village involved in NTFP collection.

Income

Income is the main indicator for all means and ends. Though the above activity undertaken by

households, but their income is very low, this is unable to cross the BPL line, so the income has depicted in different range in the following table.

Table 5: Income of households as per various income groups

Sl.No	Income Groups	Jagannath pur-1	Jagannath pur-2	Hinjolgadia	Kitadihi	Total
1	Up to 6000	39 (30.23)	44 (33.08)	32 (35.96)	33 (42.86)	148 (34.58)
2	6001-11000	20 (15.50)	17 (12.78)	15 (16.85)	13 (16.88)	65 (15.19)
3	11001-15000	23 (17.83)	22 (16.54)	15 (16.85)	8 (10.39)	68 (15.89)
4	15001-18000	21 (16.28)	18 (13.53)	14 (15.73)	8 (10.39)	61 (14.25)
5	18001-22000	14 (10.85)	15 (11.28)	7 (7.87)	9 (11.69)	45 (10.51)
6	22001 & Above	12 (9.30)	17 (12.78)	6 (6.74)	6 (7.79)	41 (9.58)
7	All	129 (100.00)	133 (100.00)	89 (100.00)	77 (100.00)	428 (100.00)

Source: Field survey, 2012

N.B.-Figures in Parentheses represent percentage to the respective totals

It is evident from above table that above 90 % households under below poverty line (BPL). 35% households under ultra poor (Up to Rs 6000/-), 15 % under the income group Rs 6001-11000, 16% under Rs.11001-15000, 14% under the income group Rs15001-18000, 11% under the income group Rs18001-22000, 10% under the income group Rs22001 &Rs18000. It reveals that the women counterparts have no such income to afford for proper diet, so the mal nutrition has become major problems in the study area. Further analysis has given in table-12 below.

Ailments and Expenditure on Treatment

Furthermore to gather knowledge of nutritional status of Munda women and their consequences due to nutritional deficiencies and expenditure incurred has collected and estimated in table-6. The study documented the occurrence of diseases during the previous year of the collection of data. The data in this respect were collected in different seasons.

Table 6: Profile of ailments of women

Village		Total Women	Not attended any PHI	Gyaemic	Itching	Fever	Anemia	Family Planning Complicacy	Pregnancy Related complicacy	Malaria	Total Women Affected
1	2	3	4	5	6	7	8	9	10	11	
Jagannathpur-1	129 (100.00)	39 (30.23)	8 (6.2)	10 (7.75)	46 (35.66)	23 (17.83)	1 (0.78)	2 (1.55)	0 (0.00)	90 (69.77)	
Jagannathpur-2	133 (100.00)	46 (34.59)	7 (5.26)	16 (12.03)	40 (30.08)	21 (15.79)	2 (1.5)	0 (0.00)	1 (0.75)	87 (65.41)	
Hinjolgodia	89 (100.00)	25 (28.09)	11 (12.36)	15 (16.85)	16 (17.98)	16 (17.98)	2 (2.25)	3 (3.37)	1 (1.12)	64 (71.91)	
Kitadihi	77 (100.00)	23 (29.87)	9 (11.69)	11 (14.29)	10 (12.99)	19 (24.68)	3 (3.9)	1 (1.3)	1 (1.3)	54 (70.13)	
Grand Total	428 (100.00)	133 (31.07)	35 (8.18)	52 (12.15)	112 (26.17)	79 (18.46)	8 (1.87)	6 (1.4)	3 (0.7)	295 (68.93)	

Source: Field survey, 2012

N.B.-Figures in Parentheses represent percentage to the respective totals

A cross examination of the data provided in the table-6 indicates that out of the total 428 sample women about 31 per cent has responded that they had not attended any public health institutions for treatment. In other words one can say that they have not suffered from any serious diseases during the year 2014. Out of the rest 295 sample respondents (69%), most of the women have suffered from various types of fevers which tunes to 26%. It also reveals that about 18 per cent Munda women had suffered from various health ailments due to severe anemic (bloodlessness) conditions which is followed by skin diseases (12%)

basically the unhygienic condition in which they live. About 8 per cent of the sample subject had suffered from various types of gynecological problems which is followed by family planning complicacies (2%) and pregnancy related problems (1%).

To add to this analysis, their average expenditures incurred to cure their illness during the last year were also estimated. To make a simplified explanation the categories of expenditures are being restricted to two only, viz., modern and traditional methods. All those compiled figures are provided in Table-7 and are presented below for further analysis.

Table 7: Average Annual Expenditures incurred for Treatments (Figures in Rs)

Village	No. of Women	No. of Women under Treatment	Modern	Traditional	Total
Jagannathpur-1	129	65	762.00	178.90	940.90
Jagannathpur-2	133	66	689.00	184.50	873.50
Hinjolgodia	89	50	799.90	195.40	995.30
Kitadihi	77	43	767.10	214.50	981.60
Total	428	224	744.74	188.92	933.65

Source: Field survey, 2012

N.B.-Figures in Parentheses represent percentage to the respective totals

From the point of per women (Both pregnant and non-pregnant) expenditure, Rs 933.65 has expenditure in the sample area. Women in Hinjolgadia village have expenditure more (Rs. 995.30) among the sample villages. It implicate that where more than 90% household under below poverty line, so expenditure in health disorder may be burden to them. As the households residing near forest, which is full of source of natural resource, but they have no knowledge about the intake of proper diet. So, proper knowledge dissemination regarding awareness on proper diet and food pattern is needed.

Nutritional status of the sample women

Furthermore, as per the methodology described earlier among various available methods two methods have been used; a) *Anthropometric Measurements* and b) *Dietary Assessment* for the purpose of estimation of the related data collected through the questionnaire. It is also mentioned above in detail that the Anthropometric Measurement is based on the height-for age and the weight-for age and the Dietary Assessment is based on the comparison of the standardized Recommended Dietary Allowance (RDA) and the observed food intake of the Munda women. All those data, estimation and corresponding analysis are being presented in the sections below.

(a) Anthropometric Measurement

This measurement of nutritional status mainly uses the Body Mass Index (BMI) to estimate the nutritional status of any population. Hence, in accordance with the standard practices adopted by various researchers the BMI data was collected and estimated for our purpose. With the help of standard weighing units the weight of each woman has collected. Similarly, the height of each woman has been measured. Both these data were computed (with the help of the mathematical formula) to estimate the BMI of married sample women (both pregnant and non-pregnant). Moreover, the utmost care and caution was maintained to assess the correct age of the woman. For this purpose, the voter card records have been referred. Moreover, to achieve the nearest truth (in case of any further doubts), the fact was cross-checked with some of the neighbors and nearest and dearest family member. The age of the women arrived at this process is taken into granted for our purpose of investigation. Further, each woman has regrouped as per the strata selected. Then the average BMI of the total number of women in each age group was estimated and provided in tables for further analysis. To obtain a clear comparative picture of the Body mass Index (BMI) of those women has prepared and given below for further analysis.

Table 8: Age-wise average BMI Status of women 15-49

Village	15-20	21-26	27-32	33-38	39-44	45-49
<i>PREGNANT</i>						
Jagannathpur-1	24.2	24.8	23.7	18.5	16.2	17.8
jagannathpur-2	23.6	23.5	22.4	17.4	16.1	18.4
Hinjolgadia	23.4	23.6	19.5	17.4	16.8	18.6
Kitadihi	21.5	21.7	18.8	17.5	15.6	18.2
Average	23.18	23.4	21.1	17.7	16.16	18.25
<i>NON-PREGNANT</i>						
Jagannathpur-1	22.4	22.5	20.7	17.2	15.6	18.8
jagannathpur-2	19.7	18.9	17.7	17.3	15.5	18.3
Hinjolgadia	18.2	18.4	17.6	16.5	15.6	18.2
Kitadihi	18.1	17.9	17.4	16.8	15.3	18.1
Average	19.6	19.42	18.35	16.95	15.5	18.35

Source: Field survey, 2012

It is revealed from above table that the normal BMI status of pregnant women is 23.18, 23.4 and 21.1 in the age group 15-20, 21-26 and 27-32 respectively. The BMI status of under nutrition women is 17.7, 16.6 and 18.25 in the age group 33-38, 39-44 and 45-49 respectively as per WHO guideline. Compare to the BMI status Non-pregnant women, the normal BMI status of the Non-Pregnant women is 19.6 and 19.42 in the age group 15-20 and 21-26 respectively. It

indicates that higher age groups women are in under nutrition than lower age groups. In other words, the pregnant women have more BMI than Non-Pregnant women. Due to the responsibility to foster and nurture their child, they ignore to their own health status, which leads mal nutrition.

To understand BMI status, mean and Standard Deviation of age, height and weight of each woman has measured and depicted in table-9.

Table 9: Mean & Standard deviation of age, Height & Weight of Sample women

Variable	Mean	SD
Age(Years)	32.00	9.96
Height(cm)	145.33	4.56
Weight(kg)	45.56	2.93
BMI(kg/m ²)	18.40	3.84

Source: Field survey, 2012

It reveals that the average age is 32 years (9.96), average height is 145.33(4.56) cm, average weight is 45.56(2.93) and average BMI is 18.40 (3.84). It indicates that low age with low height and weight result under nutrition (< 18.5) as per WHO guide line. From the point of standard deviation, the data shows very low performance. Thus, it can be inferred that the effect of socio-economic developmental factors takes some time to put some positive impact on the health and nutritional status of the women. It indicates the fact

that higher nutritional status is positively correlated with the level of education. It indicates the fact that higher nutritional status is positively correlated with the level of development, which can mainly ascribed to higher education and awareness of the women.

Furthermore, to examine how the literacy level of women influences the nutritional status, the BMI data of the women have been computed taking into consideration of the literacy level (literate/illiterate). Those computed data are presented in Table-10

Table 10: Literacy Level & the BMI Status of the women

Literacy Level	No. of Women	Pregnant		Non-Pregnant	
		No.	BMI	No.	BMI
Literate	118 (100.00)	50 (42.37)	20.6	68 (57.63)	20.7
Illiterate	310 (100.00)	105 (33.87)	17.6	205 (66.13)	17.5
Total/ Average	428 (100.00)	155 (36.21)	18.57	273 (63.79)	18.4

Source: Field survey, 2012

N.B.-Figures in Parentheses represent percentage to the respective totals

A close look at the above table reveals the literate pregnant and non-pregnant have more BMI status than the illiterate Pregnant and non-pregnant women. The distinction between pregnant and non-pregnant women is that pregnant women have more BMI status than the non pregnant women irrespective of literate and illiterate.

The BMI of the Munda women in all the sample villages, chosen is higher than the Non-pregnant women in the studied villages, irrespective of the literate or illiterate women proves that *literate, by which we mean the socio-economic development of the villages puts a positive impact on the health and nutritional status on the Munda women*. Further, a higher BMI after a certain age indicates that the general awareness plays a more significant role in the health and nutritional aspect of the Munda women rather than the level of education, i.e., literate or illiterate. Of course, this does not mean that literacy level does not play any role as it is one of the important inputs of the development which have been taken care. But from the above analyses, it can be interpreted that the effect of level of general awareness plays a more important role than the level of education or literacy of the women as observed in all the cases the mean BMI status of the women after the age of pregnancy has shown a leap forward.

Further, the comparative analyses of the Body Mass Index(BMI) of the literate and illiterate Munda women

reveal the fact that literacy has put some impact on the nutritional status of sample women but the analysis indicates that the health and nutritional status of the women are more influenced by the increase in age, which indicates that increase in general level of awareness (along with the increase in age) combined with literacy contributes to a greater degree towards the health aspect of the Munda women. Hence, *there is significant difference in the health and nutritional status of the tribal women due to the level of education of the women, i.e., illiterate and literate* is accepted which means it has got some impact on the women but it should be associated with a specific awareness programmes to be initiated by the Government and other concerned agencies.

Besides this, an attempt has been made to examine the relationship between the income level of the counterpart of the sample women and their health status. For this purpose, we have regrouped the parents in terms of a) counterpart who live below poverty line (BPL) and the b) counterpart who live above the poverty line (APL). For this purpose the standard definition of BPL and APL is used. The number of parents in each category was finalized after a thorough scrutiny of the official data and the actual income figure obtained during the study. The BMI has been calculated and the average BMI are computed for a comparative scrutiny. All those figures are provided in table-12 below.

Table 11: Income Level of the Counterparts and BMI Status of women

Poverty Line	Pregnant		Non-Pregnant	
	No.	BMI	No.	BMI
BPL	150 (36.06)	18.40	266 (63.94)	18.20
APL	5 (41.67)	23.50	7.00 (58.33)	22.40
Total/ Average	155 (36.21)	18.57	273 (63.79)	18.40

Source: Field survey, 2012

N.B.-Figures in Parentheses represent percentage

An examination of the above table indicates that most of the Munda families are living below the poverty line in sample villages. The BMI figures presented in the table indicates the average BMI computed for the number of women.

The analysis along with the figures provided in the table (the average BMI figures of the various category of women who lives in sample villages reflects that the income level of the family influences the BMI and hence the health and nutritional status of. This is also applicable for Munda women. Hence, the objective is significant that that; *"To examine whether there exists any difference in the nutritional status of the tribal women: due to the level of income of their family. i.e., Below Poverty Line (BPL) and Above Poverty Line (APL)", is accepted.*

All the above analyses (with the help of the mean Body Mass Index (BMI) of Munda women proves some important points which has been proved by data analysis is that it influenced by the socio-economic developmental factors as the BMI status of the women. In this study, as we consider those villages which are within a radius of 4–5 km from the Block headquarter or a big town, so the developmental factors include, a) better and modern treatment/health facilities for the women b) better arrangement of various awareness programs on health and nutritional status of the people and more particularly of the women c) Association of the tribal people and the women with people of other caste and creed who are more advanced etc. Though, it has been found out that in certain cases the BMI status of the literate and

illiterate women does not reflect a particularly higher status in our sample women (as it is commonly expected) but the fact that recurrence of a higher BMI in tune with the increase in age of a woman in case of literate women reflects that along with the increase in awareness level education also plays some interactive role. All these factors taken together prove that there exists a joint/interactive impact of the variables like *nature of locality*; *'literacy level' or level of education of the women* *'income level of their family' etc* on the health and the nutritional status of the Munda women.

Thus, all the analyses with the help of the Body Mass index (BMI) made above indicates the factor which really influences the health and nutritional status of the Munda women within the age group of 15 to 49 years. In addition to this to assess the exact level or standard of nutrition status of those women, the dietary assessment method has been used. Through this method the average dietary intake in terms of cereals, pulses etc. of those sample women were computed and the deficit/surplus in the dietary supplement of a woman was calculated with the help of the standardized or recommended dietary allowances for a normal adult women which is developed by the Indian Council of Medical Research (ICMR). All those data and analyses related are discussed below.

b) Dietary Assessment of the Women

The data regarding the daily food intake of each woman was collected. All care was taken to scrutinize and cross check that information. The various types of food were weighed, using simpler and standard techniques. As it was also discussed earlier that the Recall Method has been used as they are less reactive. Twenty-four hour recalls, in which the previous day's intake is queried in detail (for instance, foods, amounts of food, preparation techniques, and condiments) are easiest for individuals to complete. The data reported are converted from foods such as cereals and pulses etc. Also, to accommodate the seasonal and other variations the food composition and the dietary intake of the women for thirty days, which was divided into various sub-groups in accordance with different types of food calendar were studied followed by the women. These multiple recalls can be thought of as sampling from an individual's ongoing food behavior. All those data collected were computed and tabulated for the analyses and compared with the Recommended Dietary Allowances (RDA) developed by the ICMR for a healthy woman within the age group of 15 to 49 years.

The most common food items used by the family and more particularly the Munda women intake rice (*madi*), curry (*utu*), leafy vegetables and meat. They consume pulses like Kolatha (*hale*) and Muga (*mugi*), Harada (*rahali*), Biri (*rambda*) which are local pulses available. In addition to this they eat vegetables like pumpkin (*kokhru*), brinjal (*bengala*), ladies finger (*vondo*), potato (*golalu*), tomato (*belati*) gourds (*jingha*) and bottle gourd (*karla*). The prominent leafy vegetable (*ala*) constitutes *Kosala ala*, *mula ala*, *leper ala*, *mani ala*, *munga ala*, *poi ala* which was also supplemented with other leafy products primarily collected from their own back yard. Roots and tubers like sweet potato (which are mainly collected from the forest surrounding their villages also features in their food routine along with the tole Seed (oil Seed). Besides these the food basket of the Munda women also constitutes flesh foods like chicken (*sim*), goat (*merang*), sheep (*vedi*), pigeon (*parai*), duck (*koda*) etc. Also, they use fruits (mostly collected from the nearby forests) like Amla (*ambdu*), Mango (*uli*), kendu (*tirul*), charkoli (*tarob*) and Tamarind (*jojo*) which are normally available seasonally. Besides these food stuff they also use tubers in their diet like saru (*saruni*), ulakobi (*pindi*), khambalu (*hatikata sanga*) and different types of mushrooms (*utt*) which constitutes more or less a specialty to the Munda women. The data in relation to these diets were assessed and the mean food intake of various categories of the women are weighed and presented as the 'Observed Intake' in the following tables and compared with the RDA. The corresponding figures are presented below.

As observed from the above table that the observed mean food intake shows a negative trait in comparison to the RDA, which indicates a lower amount of food intake by the Munda women. An examination of the comparative figures reveals that the boys are consuming about 385 less flesh foods than the RDA, followed by Oils & fats (37%), Roots and Tubers (33.33%), Vegetables (22.50%), Fruits (20%). On the other hand, though less than RDA in comparison to other food stuff the Munda women consume more cereals and pulses than other food stuffs. Similarly, the Munda women girls also consume food stuffs lesser than the RDA. As reported and computed by us the girls consume about 51% less flesh foods followed by oils and fats (37.375%), Vegetables (30%) and Fruits (28.89%). Though, the girls consume more cereals and pulses but it also falls short of the RDA (4% for cereals and 10% for pulses).

It is observed from above table that calorie intake by women in sample area is 1177.72 which is less than 2400 calorie (For BPL standard). The result shows that under nutrition among the women due to low calorie intake.

Table 12: Mean Food Intake

Sl. No	Food Stuffs	RDA	Pregnant Women		Non-Pregnant women	
			Observed Intake	% Deficit (-) %Surplus(+)	Observed Intake	% Deficit (-) %Surplus(+)
1	2	3	4	5	4	5
2	Cereals	150-200	170	(-)2.85	168	(-)4.00
3	Pulses	40-50	42	(-)6.67	40.5	(-)10.00
4	Vegetables	30-50	31	(-)22.50	28	(-)30.00
5	Leafy Veg.	50	40	(-)20.00	41	(-)18.00
6	Root & Tubers	30	20	(-)33.33	26	(-)13.33
7	Oil &Fats	200	74	(-)37.00	74	(-)37.00
8	Flesh Foods	30-40	28	(-)37.78	22	(-)51.11
9	Fruits	20-25	18	(-)20.00	16	(-)28.89

Source: Field survey, 2012

Table 13: Calorie Intake of Sample women

SLNo	FOOD STUFS	Food Intake	Calorie	Protein	Carbo-hydrate	Fat	Carotin	Vit-C	Calcium	Irone
1	Rice	172	595.12	11.01	135.88	0.69	0.00	0.00	15.48	1.72
2	Kolath	5	16.05	1.10	2.86	0.03	3.55	0.05	14.35	0.00
	Mung	5	17.40	1.23	0.08	0.06	2.45	0	14.35	0.34
	Harada	23	78.89	5.77	13.57	0.16	62.1	0	15.87	1.74
	Biri	5	17.35	1.20	2.98	0.07	1.9	0	7.70	7.00
3	Pumpkin	7	1.75	0.10	0.32	0.01	3.5	0.14	0.70	0.03
	Potato	10	9.70	0.16	2.26	0.01	2.4	1.7	1.00	0.05
	Brinjal	5	1.20	0.07	0.20	0.02	3.7	0.6	18.00	0.02
	Tomato	3	0.69	0.06	0.11	0.00	5.76	0.93	0.60	0.05
5	Kosala	14	6.30	0.56	0.854	0.07	35.7	1.4	55.58	0.49
	Other*	26	7.80	0.96	0.754	0.104	452.4	9.1	39	1.1
4	Khamba Alu	8	9.60	0.10	2.256	0.024	0.48	1.92	3.68	0.02
	Mushroom	10	4.30	0.31	0.43	0.08	0	0	0.6	0.15
6	Tola seed	50	360.50	16.73	11.97	27.3	0	0	210	39.69
7	Chicken	5	8.65	0.67	0	0.665	30	0	3	0.10
	Mutton	10	11.80	2.14	0	0.36	0	0	1.2	0
	Pigeon	10	15.00	1.93	0.13	0.75	0	0	1	0.63
8	Mango	4	2.96	0.02	0.676	0.016	109.72	0.64	0.56	0.05
	Tamarind	10	11.50	0.58	1.82	0.21	25	0.3	10.1	0.03
	Amla	2	1.16	0.01	0.274	0.002	0.18	12	1	0.02
	Total		1177.72	44.70	177.43	30.62	738.84	28.78	413.77	53.23

Source: Computed from Nutritive value of Indian Foods, NIN, ICMR, Hyderabad.

Food Habits

The most common staple food in general is boiled rice. The more well-to-do families use boiled pulse or 'dal' as a side dish, But for most of the poorer category of the people food except on special occasions, consists of only some boiled green herb or 'ala' along with the boiled rice, pigeon meat, hen etc. Fowls, goats, hens, pigs are reared for food, but are mainly used for festival purposes and sacrifices. Besides the green herbs or 'ala,' the more well-to-do families occasionally use vegetables grown on their own backyard or farm lands. They usually grew onions, brinjals, radishes, tomatoes, pumpkins and gourds, lady's fingers (*hebisicus Esculentus*), beans, varieties of tubers and vegetable roots such as the sweet potato (*Ipomea batktus*) etc as described above.

An examination of the food habits indicates that

the women (mostly the house lady) take her meal after all the family members finishes theirs which is normally followed by the Hindu societies. Also, they drop a few grains of rice on the ground in the names of his deceased ancestors before taking their meals which is followed by some orthodox Hindu communities. The most used and the most favorite drink of the Munda is rice-beer (Handia), which is made of boiled rice which is fermented and mixed with certain kinds of other drink also. This liquor is stored in earthen jars and silver jars become ready for use in about four/five days. It is taken always by them whether it is sad or in happy moments. Now-a-days mostly the young ones prefer the distilled liquor shops opened up in the nearby areas. It has documented that the Munda people ordinarily smoke tobacco. Moreover, the use of betel (gutka) or betel-nut is practically very common.

Conclusion

The empirical analysis thus concludes that the age-old cultural values show their profound impact on perception of nutritional value. Impact of education and income have identified as a major factor, which brings some changes in their nutritional status and has helped in the introduction of modern health care systems among the Munda tribes to a certain extent. But it is not so that all educated respondents hold the scientific view that physical factors, unhygienic food, unclean drinking water, and poor sanitation etc. are the factors responsible for occurrence of the under nutrition and supernatural powers has a little role to play. In the above discussion whoever had the idea of the factors for causation of malnutrition other than supernatural powers they are literate and some of them belong to higher group of education which indicates the fact that a higher level of education has got a direct and proportional link to the health, hygiene and the nutritional status of the tribal people and more particularly to women.

Efforts to reduce under nutrition depend on reducing poverty and raising people's living standards by improving the quality of homes and by increasing access to clean drinking water and adequate sanitation. Such interventions have positive impacts on health, and implementing these also goes some way towards fulfilling people's basic human rights. Unfortunately, these variables were not studied in the present investigation. However, the results clearly indicate that the Munda women, Mayurbhanja, Odisha are under severe nutritional stress. Therefore, it is imperative that immediate nutritional intervention programs are initiated among this population. Such programs would be beneficial in not only reducing the rates of malnutrition, but also they are associated maladies of morbidity and mortality.

References

1. Acharya Sabita. 2007. III health, Disease and Indigenous Health Care systems among the Munda- A Primitive Tribe of Odisha. Intangible Cultural Heritage of India -5, Traditional Knowledge in Contemporary societies: Challenges and Opportunities, New Delhi. Pratibha Prakashan.
2. Acharya, Akash .2008. Access and Utilization of Health Care Services in Urban low income settlements in Surat, India", Working Paper, Centre for Social Studies, Surat.
3. Goswami Monali, Bijaylaxmi Dash, N.C Dash. 2009. Reproductive performance of the Bhumija women: An empirical study of a Tribal village, Baleswar, Odisha Study Tribes Tribals. New Delhi. Kamala Raj Publications.
4. Journals: Goswami Monali, Bijaylaxmi Dash, N.C. Dash. 2011. Traditional method of Reproductive Health Care Practices and Fertility among the Bhumija Tribe of Baleswar, Odisha. *Ethnomedicine*, 5(1)51-55.
5. Kaushik Bose and Falguni Chakraborty.2011. Anthropometric characteristics and nutritional status based on body mass index of adult Bathudis: a tribal population of Keonjhar District, Orissa, India.
6. Nayak, Ajanta.2007. Nutritional status of tribal children in Koraput District" submitted Ph.d thesis.
7. Panda, Prasant, Atulya Bhoi, Yoginder Singh, K.Sankaraiyah. 2007. The Health Status of Tribals in India: Evidence from Andhra Pradesh. *Health Economics in India* ed. by Himansu S. Rout, New Delhi. New Century Publications.
8. Patra, N.Rabi. 2007. The Health Care Delivery System in Orissa. *Health Economics in India*. ed. by New Delhi. New Century Publications.
9. Journals: Prabha Chauhan, VKS Chauhan, Praveen Srivastava. 2011. Rural Epidemiology of Maternal Mortality in Tribal Women from Bastar, Chhattisgarh, India. *International Journal of Biological and Medical Research*, 2 (4): 1106-1109.
10. Journals: Varma G.R. 2011. Antenatal care service utilization in tribal and rural areas in a South Indian context: an evaluation through mixed methods approach. *Egypt Public Health Association*.