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Original Article

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Infant Morbidity and Infant Death among Two Linguistically Cognate Tribes of North-East India

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Abstract

India is a developing country struggling hard to reduce the rate of infant mortality but yet to gain success because it is a country of numerous tribal and non-tribal groups with unique cultures and world-views which affect the prenatal, antenatal and post natal developments differentially. The study attempts to highlight the infant morbidity that lead to infant mortality in two linguistically cognate tribes, namely, the Mising of Assam and Minyong of Arunachal Pradesh. Many scholars state that the Mising tribe of Assam have migrated from the hills of Arunachal Pradesh and originally inhabited the same ecology as that of the present Minyongs. At present; Misings are concentrated in the Brahmaputra riverine areas of Assam and these areas are perennially affected by floods; which is a new stress for them after migration from the hilly terrains. The decadal growth rates have proved that the Mising population has increased and at present they are the second most populated scheduled tribe (plains) of Assam. The number of survivors upto the reproductive age is an important indicator of biological adaptation as well as the outcome of natural selection in the particular stress (flood) and the indices of selection intensity show that the number of survivors is quite more among the Misings than that of the Minyongs. In this point, the number of surviving and healthy infants plays a significant role and its an urgent need to highlight the morbid conditions of these two tribes.

Keyworsd: Infant Morbidity; Linguistically Cognate Tribes; Prenatal; Antenatal.

Introduction

The infant form an important and considerable portion of a population. The perpetuation and expansion of a population is completely dependent on the surviving infants and their viability upto the reproductive age. It is, therefore, extremely important and essential to study this considerable and delicate proportion of the population. It is an outcome and hence it directly measures the results of distribution and use of resources. India is a developing country struggling hard to reduce the rate of infant mortality but yet to gain success. This is because India is a country of numerous tribal and non-tribal groups with unique cultures and world-views which affect the prenatal, antenatal and post natal developments differentially. The North-East part of the country is inhabited by many tribal groups which still lead simple ways of life and not easily accessible to the health care facilities. Though, the government has set up public health centres wherever possible but they rarely seem to approach those due to geographical non-accessibility or due to more preference of cultural and traditional values and practices.

The study attempts to highlight the infant morbidity that lead to infant mortality in these two linguistically cognate tribes. The health of the infants and infant mortality influence greatly the structure and shape of a particular population at a point of time. The North-East part of the country is inhabited by many tribal groups who are mainly endogamous

and socio-culturally unique. Of the North-East Indian states, Assam and Arunachal Pradesh are neighbours, but geographically, Assam is mostly a valley of the mighty river Brahmaputra and Arunachal Pradesh is a hilly state. The present Arunachal Pradesh, from the point of geography and the Constitution of India, a part of undivided Assam, was treated as a separate area for the purpose of the 1961 census. Many of the tribes of Assam of today have migrated from the hilly terrains of the present day Arunachal Pradesh. The Mising tribe of Assam is one of such tribes (Bhandari 1992, Pegu 2005). The area of Arunachal Pradesh from which the Misings migrated is inhabited by a group of tribes known as the broader term-Adi since time immemorial. At present; Misings are concentrated in the Brahmaputra riverine areas of Assam, with the state boundary with Arunachal Pradesh. The riverine areas in the northern banks of the Brahmaputra stretching from the old site of Sadiya in the East, down to the confluence of the Jiabhoroli in the west, lying approximately between Longitude 93p /E and 97p /E and Latitude 27p /N and 28p /N can be loosely considered as the Mising area (Pegu 2005) and these areas are perennially affected by floods; which is a new stress for them after migration. The decadal growth studies after every census enumeration have proved that the Mising population has increased and at present they are the second most populated scheduled tribe (plains) of Assam (Census Report 2011). The Minyong is a tribe that belongs to the broader group of Adi of Arunachal Pradesh and shows socio-cultural and linguistic affinity to the Misings of Assam. Many scholars believe that the Mising tribe originally inhabited the same ecology as that of the Minyongs. However, the reason of Mising tribe migration to the down from the hill is still hoary. Taid states, 'the unmistakable cultural and linguistic affinity of the Misings of the Brahmaputra valley and several ethnic groups of Arunachal Pradesh, especially the cluster called Adi, points to their having been the same group of people in the distant past' (Taid 2012:228). The number of survivors upto the reproductive age is an important indicator of biological adaptation as well as the outcome of natural selection in the particular stress (flood) and the indices of selection intensity show that the number of survivors is quite more among the Misings than that of the Minyongs. In this point, the number of surviving and healthy infants plays a significant role.

Method

The data for the present study are collected from two tribes, namely, the Misings of Assam and the Minyongs of Arunachal Pradesh. The population of Mising is chosen from the village Kumarbari in Majuli Island situated in Jorhat district of Assam. Kumarbari village is situated in Jengraimukh sub-division, which is predominantly populated by the Misings only and about 25 kilometers away from the Kamalabari township of Majuli. Moreover, Majuli being a river island is to a significant extent isolated from the mainstream of Assam and unlike the other parts is comparatively less accessible and more or less isolated. Thus, the Kumarbari village can be regarded as more or less isolated geographically and socio-culturally from other tribal and caste populations and is homogenous. However, the village is heavily flooded during every summer, sometimes twice or thrice a year. The Minyongs are largely concentrated in the East, South-East and West Siang district of Arunachal Pradesh. The village-Mori-selected for the study of the Minyong tribe is located in the West Siang district about 11 kilometers away from Aalo Head-Quarters of Arunachal Pradesh. The village is also a homogeneous one and situated in the hill slope of Arunachal Pradesh and faces the south bank of the river Siang. A total of 330 Minyong households and 394 Mising households are observed. Of these Mising households, 201 households occupy the Kumarbari village in Majuli. The evermarried mothers from each of the village with atleast one living are interviewed for the purpose of fertility and infant mortality. The infant mortality rate is calculated by taking the number of infant death in the past one year.

Result

Sex-wise distribution of infant death in various age groups of women is presented in tables 1 A, B. It is evident that the overall percentage of infant death is quite higher among the Minyong women (16.20%) than that of the Mising women (12.18%). Moreover, the incidence of male infant death is higher than that of the female infant deaths in both the populations. The percentages of infant deaths tend to increase with the increasing age groups of the mothers in both the populations with certain minor fluctuations in-between. It is important to note here that the Minyong mothers of aged 15-19 years show comparatively higher percentage of male infant death (12.50%) than the mothers of higher age categories. It is interesting that the Mising and the Minyong mothers of age-groups 20-24 years and 25-29 years show preponderance of female deaths over male deaths.

Distribution of infant mortality rate among the Misings and the Minyongs are presented in Table 2.

The tables show that the infant mortality rates are quite higher among the Minyongs as well as among the Misings. However, the Minyongs (105.77) show comparatively higher infant mortality rate than that of the Misings (78.53). In addition to this, the neonatal and post neonatal mortality rates are also evidently higher among the Minyongs than that of the Misings. In both the populations, post-neonatal mortality contributes more towards the total infant mortality rate, which signifies that exogenous factors are more responsible for the higher infant mortality rate in these populations.

Infant mortality according to birth order is presented in Table 3.

It is evident from the table that the highest birth order among the Minyongs as well as among the Misings is found to be nine (09). The percentages of infant death are found to increase, particularly from the 2nd birth order to higher birth order in both the populations. In the 1st birth order, the incidence of infant death is quite higher among the Minyongs (22.25%) than that of the Misings (5.00%). However, thereafter, the percentages decrease in the 2nd birth order and a further decrease is noticed in the 3rd and the 4th birth order among the Minyongs. The lowest percentage of infant death is observed in the 2nd birth order (1.87%), followed by the 3rd birth order (4.91%) among the Misings, whereas, among the Minyongs, the lowest percentage of infant death is observed in the 3rd birth order (2.99%), followed by the 4th birth order (3.79%). The incidences of infant deaths suddenly increase from the 5th birth order in the Misings as well as among the Minyongs. The 9th birth order show the highest percentage of infant death among the Minyongs (25.16%) and the 8th birth order show the highest percentage of infant death among the Misings (17.74%).

Symptoms and Causes of Infant Death

Various symptoms and causes of infant deaths among the Minyongs and the Misings are shown in Table 4.

The various causes and symptoms of infant death have been categorized as shown below. Verbal autopsy is considered the most feasible and visible method for assignment of cause of death among infants. The causes as described by the couples are as follows-

- Stomach problem/troubles: Diarrhoea, stomach pain, lose of appetite, food poisoning (loose motion with vomiting).
- Acute Respiratory Infections (ARI): Not able to breathe after birth, unable to cry after birth, whooping cough and not able to suckle normally after birth.
- Jaundice: Yellow colour of the skin and whites of the eyes.
- Cough and fever: Cough, fever, pneumonia (two of the following symptoms are described- stopped suckling, fever or cold to touch, vomiting, convulsions, chest in-drawing fast breathing), measles and typhoid.
- Preterm birth: Birth that took place before due time and baby is very small or smaller than the usual at birth.
- Other infections and birth injury: Infections due to unhygienic removal of the umbilical cord by using unsterilized weapons like bamboo splinter, old blades, knife and even sharp edge of the stone.
- Birth injury refers to signs of injury at birth, which leads to death within 7 days of birth.
- Causes not identified Informants who were unable to express the causes/ symptoms of the death cases.

Table 4 shows that the prime cause of infant death is stomach ailments, mainly diarrhoea both among the Misings (37.77%) and also among the Minyongs (34.91%). The respondents described loose motion, vomiting and loss of appetite as the symptoms of such death. However, it is also noticed that ARI also form an important cause of infant death among the Misings (18.45%) and the Minyongs (19.23%). These infants died after a few hours of birth and were unable to suckle. The percentage of infant death due to jaundice is also much higher among the Misings (10.73%) than among the Minyongs (3.25%). The incidence of preterm death is more common among the Minyongs (14.21%) and it is almost five times higher than that of the Misings (3.00%). The pre-term births occurred before the 32 weeks of gestation both among the Misings as well as among the Minyongs. These infants seemed to suffer from jaundice and were unable to suckle, death occurred within the first week of life. Preterm birth, acute respiratory diseases and birth injury along with other infections form the prime causes of neonatal infant death in both the populations. Causes of about 5.15 per cent of Mising and 2.66 per cent of Minyong infant deaths could not be identified as the parents did not wish to mention the symptoms.

Table 5 present the per cent distribution of live births according to the place of delivery. It is quite

apparent that highest percentage of deliveries took place at home among the Minyongs (98.51%) as well as among the Misings (95.56%). The Minyongs do not show a single case of delivery at Private Nursing home whereas 0.21 per cent (delivery of two live births of two mothers) of deliveries of the Mising mothers took place at a Private Nursing home. The Minyongs strongly prefer a home delivery than going to health centres.

Relationship between fertility and infant mortality among the Misings and the Minyongs are shown in tables 6 A, B.

It is observed from the tables that the 1st parity mothers do not show any cases of infant death and the percentages of infant death increases with the increasing parity of the mothers. The 9th parity Mising mothers and the 8th parity Minyong mothers experience the highest incidence of infant death whereas the 2nd parity Mising mothers and the 3rd parity Minyong mothers experience the lowest incidence of infant death.

Out of a total of 2086 live births among the Minyong mothers, 83.79 per cent survived beyond infanthood and the rest 16.68 per cent resulted into infant death. However, the Mising mothers show comparatively lower percentage of infant death (12.18%) than that of the Minyong mothers (16.68%) and thus, the percentage of survivors is comparatively higher among the Misings (87.82%) than that of the Minyongs (83.79%). On the other hand, it is noticed that the percentage of survivors increase from the higher to the lower parity of mothers both among the Misings as well as among the Minyongs.

Thus, the study indicates a direct relationship between the fertility level of a mother and the incidence of infant death. Higher the parity, higher is the percentage of infant death noticed in the populations and an inverse relationship is noticed with the parity and the percentage of living children.

Table 1 a: Sex-wise distribution of infant deaths in various age groups of Minyong women

Present Age Group of Women (Years)	No. of Women	No. of Live Births	Infant Deaths					
			Male		Female		Total	
			No.	%	No.	%	No.	%
15-19	10	8	1	12.50	-	-	1	12.50
20-24	42	75	5	6.67	6	8.00	11	14.67
25-29	46	131	8	6.11	11	8.40	19	14.50
30-34	48	209	14	6.70	13	6.22	27	12.92
35-39	44	252	18	6.87	15	5.95	33	13.10
40-44	43	276	20	7.14	18	6.52	38	13.77
45-49	40	248	23	9.27	16	6.45	39	15.73
50-54	36	252	25	9.92	21	8.33	46	18.25
55-59	25	173	18	10.40	13	7.51	31	17.92
60-64	22	151	19	12.58	18	11.92	37	24.50
65+	44	311	30	9.67	26	8.36	56	18.01
Total	400	2086	181	8.68	157	7.53	338	16.20

Table 1 b: Sex-wise distribution of infant deaths in various age groups of Mising women

Present Age Group of Women (Years)	No. of Women	No. of Live Births	Infant Deaths					
			Male		Female		Total	
			No.	%	No.	%	No.	%
20-24	28	38	-	-	1		1	2.63
25-29	62	124	1	0.81	3	2.42	4	3.23
30-34	49	158	3	1.89	5	3.16	8	5.06
35-39	58	239	9	3.76	8	3.35	17	7.11
40-44	34	193	12	6.22	8	4.15	20	10.37
45-49	34	217	16	7.37	11	5.07	27	12.44
50-54	30	199	19	9.55	16	8.04	35	17.59
55-59	28	194	16	8.25	12	6.18	28	14.43
60-64	34	241	21	8.71	17	7.05	38	15.76
65+	43	310	31	10.00	24	7.74	55	17.74
Total	400	1913	128	6.69	105	5.49	233	12.18

Table 2: Distribution of infant mortality rate of the misings and the Minyongs

Populations	Number of Live Births	Infant Mortality Rates		
		Neo-Natal	Post Neo-Natal	Total
Minyongs	208	10 (48.07)	12 (57.69)	105.77
Misings	191	6 (31.41)	9 (43.27)	78.53

Table 3: Infant deaths according to birth order

Birth Order	Misings			Minyongs		
	No. of Live Birth	Infant Death		No. of Live Birth	Infant Death	
		No.	%		No.	%
1	400	20	5.00	400	89	22.25
2	375	7	1.87	387	33	8.52
3	326	16	4.91	367	11	2.99
4	280	30	10.71	343	13	3.79
5	234	59	25.21	263	40	15.21
6	154	46	29.87	159	53	33.33
7	90	30	33.33	97	54	55.67
8	38	20	52.63	49	28	57.14
9	16	6	37.50	21	17	80.95
Total	1913	233	12.17	2086	338	16.20

Table 4: Symptoms and causes of infant death

Symptoms/causes of infant death	Number and percentage of infant death			
	Misings		Minyongs	
	No.	%	No.	%
Stomach trouble/diarrhoea	88	37.77	118	34.91
Acute respiratory infections	43	18.45	65	19.23
Jaundice	25	10.73	11	3.25
Fever/influenza	19	8.15	24	7.10
Preterm birth	7	3.00	48	14.21
Other infections/birth injury	39	16.74	63	18.64
Causes not identified	12	5.15	9	2.66
Total	233	100.00	338	100.00

Table 5: Distribution of live births by place of delivery

Place of delivery	Live births			
	Minyong		Mising	
	No.	%	No.	%
Public Health Centre	31	1.49	83	4.34
Private Nursing Home	-	-	2	0.10
Home	2055	98.51	1828	95.56
Total	2086	100.00	1913	100.00

Table 6 a: Relationship between fertility and infant mortality among the Minyong women

Parity	No. of Women	Total No. Of Live Birth	Living		Dead	
			No.	%	No.	%
1	13	13	13	100.00	-	-
2	20	40	36	90.00	4	10.00
3	24	132	126	95.48	6	8.33
4	50	260	234	90.00	26	13.00
5	104	520	431	82.88	89	17.12
6	62	372	308	82.79	64	18.55
7	48	336	273	81.25	63	20.24
8	28	224	175	78.13	49	21.87
9	21	189	152	80.42	37	19.58
Total	400	2086	1748	83.79	338	16.20

Table 6 b: Relationship between fertility and infant mortality among the Mising women

Parity	No. of Women	No. of Live Birth	Living		Dead	
			No.	%	No.	%
1	25	25	25	100.00	-	-
2	49	98	97	98.98	1	1.02
3	46	138	136	98.55	2	1.45
4	46	184	177	96.19	7	3.81
5	80	400	377	94.25	23	5.75
6	64	384	342	89.06	42	10.94
7	52	364	309	84.89	55	15.11
8	22	176	125	71.02	50	28.41
9	16	144	92	63.89	52	36.11
Total	400	1913	1680	87.82	233	12.18

Discussion

Infant mortality rate is a good indicator of health and well being of a population. India is still fighting hard to lower down the rate of infant mortality (47 per 1000 Live Births in 2010) which is quite higher than the developed countries. Being a country with numerous cultural groups, it becomes very difficult to set a particular policy norm for a desired directed demographical change. North-East India being an abode of many tribal groups with diverge socio-cultural values tend to add differently in the national average of ant demographic component. It has been observed in the present study that both among the Minyongs as well as among the Misings, post-neonatal mortality rates are higher than the neonatal mortality rates. The sample registration system (2012) figure for India, however, is in contrary to the present findings. According to SRS, neonatal mortality rate for India is higher than the post neonatal mortality rates. The neonatal mortality and post-neonatal mortality rates of the Minyongs as well as the Misings are higher than that of India. The reasons for high neonatal mortality rate might be due to the absence of proper medical care especially in the antenatal period to the expectant mothers and the health centres are quite far away from their villages; moreover, they traditionally prefer to deliver the child in the home rather than in the health centre. Another reason for high neonatal mortality in both the tribes is that the umbilical cord of infants after birth is cut with a sharpened bamboo strip or an unsterilized blade or knife either by the mother herself or by the mid-wife without any fear of infection. Moreover, the incidence of male infant death is higher than that of the female infant deaths in both the populations. It is also evident that due to the lack of education and awareness among the couples (more evident among the Minyongs), the infants are rarely immunized and the female infants are taken to health centre whenever suffer from severe illness. The Minyongs believe that immunization of mothers and the infants may cause harm to the infants. They prefer to take some indigenous medicines prepared by the local priest. Such kind of attitude is prevalent among both the Misings also. The percentages of male and female infant deaths tend to increase with the increasing age groups of the mothers in both the populations. Hobcraft *et al.* (1984) stated that children born to very young or to very old mothers experience more mortality compared to those born to mothers in the intermediate age groups. Ruzicka and Kane (1987) are of the opinion that the increased risk of infant death among the old mothers may be due to the maternal depletion syndrome such as undernourishment, anaemia and general weakness associated with the biological demands of excessive reproduction. Various studies have proved that adolescent motherhood can be associated with a less sensitive parenting style and inadequate relationship between the mother and the infant. Moreover, in the present study it has been noticed that most of the infants to the adolescent mothers die due to occurrence of diarrhoea, preterm birth, inadequate delivery and post-delivery care and inexperienced parenting style. Kramer *et al.* (2000) showed that prematurity increases the risk for neonatal death due to birth asphyxia. It is pertinent to note that the incidence of preterm death is more common among the Minyongs and it is almost five times higher than that of the Misings. Moreover, among the Minyongs, during painful parturition or when childbirth does not take place easily, the family members sacrifice a dog or a fowl to appease the spirit (*uyu*) responsible, which is locally known as *nippong*. Sometimes a priest (*miri)*, if on hand, is called upon to do the ritualistic sacrifice. Thus, rarely approach a medical practitioner. The Minyongs believe that the spirits of women who die during childbirth become a malevolent spirit (*nippong uyu)* and when needs propitiation induce troubles during the childbirth. Such a ritual is also evident among the Misings of the present study. Majority of the infants received colostrum according to our study and exclusively breastfed upto 4 to 5 months. Two infants of the Minyong tribe whose mothers died at the time of parturition were fed with sugarcane juice mixed with rice soup. One of these infants died during the neonatal period. It is now confirmed that exclusive breastfeeding upto six months from birth tend to decrease infant morbidity and mortality (Edmond *et al.* 2006).

Notes

The Mising Agom Kebang (Linguistic Society of the Mising) have accepted the name Mising instead of Mishing (as stated in government documents) in their linguistic society. So the investigator have chosen the endonym of the tribe.

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Original Article

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Ethno-Medicine and Health Care Practices among Tribal Community in Bastar District of Chhattisgarh, India

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Abstract

The traditional knowledge prevailing among the tribes as well *traditional herbal healers/ Baigas/ Guinias* in Bastar district of Chhattisgarh regarding use of various plants for different ailments. Ethno-medicine developed gradually having its origin in the indigenous medicinal practices. The main purpose of the study was to make survey of plants that have ethno-medicinal value and investigate the uses and management practices.

The traditional knowledge from local tribal people as *traditional herbal healers/ Gunias/ Baigas* has been documentation during the studies. The information was collected by interviewing local *traditional herbal healers/Gunias/ Baigas* in Bastar district. They have immense knowledge about plants and drugs are being utilized by tribals since long back by collecting plants and their parts to prevent for different ailments. Ethno-medicinal information of medicinal plants were obtained from informants by semi-structured interview, observations, focus group discussions and case study.

95 medicinal plant species were documented, which are used to treat 38 human diseases. The category of medicinal plant species includes shrubs, herbs, trees and climbers etc. Roots, leaves, fruits and flower are the most frequently used plant parts. The method of preparation is by crushing, powdering and mixing with cold water to serve as a drink and chewing.

Tribal People of Bastar are knowledgeable about the plants, their distribution, medicinal use and management. Indigenous practices somehow contributed to the sustained use, management and conservation of medicinal plants. Knowledge of medicinal plants is wider among elderly women and men. The results of this study indicated significant contribution in efforts directed towards conservation and sustainable harvesting of medicinal plant resources.

Keywords: Traditional Knowledge; Ethno-Medicine; Conservation and Sustainable Harvesting.

Introduction

India has 16 Agro climatic zones, 45000 different plant species out of which 15000 are medicinal plants. The Indian Systems of Medicine have identified 1500 medicinal plants, of which 500 species are mostly used in the preparation of drugs. The Indian Systems of Medicine, particularly Ayurveda, Siddha, Unani, & Homoeopathy medicine largely use plant base materials, minerals, metals, marine and products of animal origin. Our ancient texts had documented medicinal uses of a large number of plants. These plants are being used for preparation of medicines for centuries (Verma, D.M., Balkrishna, N.P. & Dixit, R.D., 1993).

India has century's old heritage of medicinal plants and herbal medicines for curing human illness and promotion of health in tribal and rural areas. Medicinal plants are often, the only easily accessible health care alternative for the most of our population

and traditional medicines remained a part of our integral health system. Indigenous people have shown evidences of historical continuity of resource use and possess a broad base knowledge of the complex ecological system existing in the vicinity of their habitat (Smvastar, S., 1996). Thus there exists an intensive relationship between the two entities i.e. forest and tribals. The life, tradition and culture of tribals have remained almost static since last several hundreds of years. The knowledge accumulated by them through a long series of observations from one generation to another is transmitted oral communication for power possessed by medicinal plants in cure of various diseases and ailments.

Almost all the countries of the world have started documenting their traditional knowledge on herbal medicines. This requires documenting each and every knowledge from every look and corner. These efforts have although succeeded in documenting such knowledge from many areas but there are still several areas from where the traditional knowledge has to be extracted and documented (Oommachans, M. & Shrivastava, J. L.,1996). Chhattisgarh state is one of the areas enriched with the plants of medicinal value. There are several areas in state, difficult to approach as well as several tribes which are difficult to communicate and these are the areas and tribal people their knowledge required to be documented. The Bastar District is abundantly and richly endowed with forest resources. The various types of trees found in Bastar forests are *Teak, Sal, Sirsa, Bijasal, Kusum, Palas, Mahua, Imli, Tendu, Harra, Kanha, Salai, Achar, Dhowara, Bhulra, Rohni, amla, Khair, Samar* etc (Bhalla, N.P., Sahu, T.R., Mishra, G.P. & Dakwala, R.N.,1982).

Halba, Muria, Maria, Bhatra and Gond are found in Bastar district of Chhattisgarh. They live in remote, dense forest area. The forest cover is about 44 percent, 3rd maximum in country. Herbal medicines are being investigated with more interest. This is not because they are cheaper but because the type and variety of medicines available in herbal medicine than the scientists all over the world together can synthesize in their laboratory. Bastar district of Chhattisgarh state is one of the districts very rich is variety of plants. So far, very little documentation is available for the medicinal plants. Similarly, the primitive tribes, their socio-economic condition, knowledge of medicinal plants and livelihood security are still to be documented. Present studies, therefore bear special significance, to be first of its kind to document the traditional knowledge of the tribes of Bastar, Chhattisgarh as well as in India, with a systematic recording the tribal knowledge.

Methodology

Tools

- Household surveys (viewed as the main component of the field work).
- Oral histories (based on open discussions with widely recognized knowledgeable elders).
- Focused Group Discussions with mothers at local health centers.
- Local market surveys.
- Questionnaires administered to high school students and teachers.
- Structured interviews with (both modern and traditional healers/Baigas/Gunias) professional health practitioners.

Materials and Methods

The methodology covers two types of survey namely:

- Field Survey
- Literature Collection

Method Followed for the Study

Data have been collected from major two levels of sources i.e. primary and secondary. Primary information with reference to selected tribal communities has been collected with the help of structured questionnaire followed by interview and observation. Secondary information pertaining to relevant Government records and other facts has collected from various records and reports and related research journals, bulletin and herbaria.

To collect information from primary and secondary level sources have been analyzed and tabulated with the help of simple method of statistical tools and techniques for writing the final article.

Sampling

Purposive sampling design has been drawn to decide the size of the sample by taking into consideration the following criteria.

- Concentration of the tribal population in the selected region.
- Communities have been selected from village which has far away from urban area by taking into consideration the existing infrastructure facilities.

- Communities also have been selected on the basis of who are residing near the forest area.

Altogether 450 households are taken for this present study.

Table 1: Study villages with surveyed household

State	District	Block	Village	Surveyed Household
Chhattisgarh	Bastar	Bastar	Kachira	55
			Dhurguda	55
			Kurandi	55
			Jamguda	55
			Mundapara	55
			Badepara	55
			Arabal	60
			Hatguda	60
	Total			**450**

Area of Study

For the present study researcher carried out the field work at least 15 to 20 percent of villages under one block namely- Bastar in Bastar district of Chhattisgarh on the basis of higher/ rich biodiversity of medicinal plants used by Baigas or Gunias. The field study was carried out in the villages and forest villages of the Kachira, Dhurguda Kurandi, Jamguda, Mundapara, Badepara, Arabal and Hatguda forest area of Bastar District (C.G).

Objectives of Study

(i) To examine the various types of indigenous herbal drugs practices among the different tribal groups of Bastar district of Chhattisgarh.

(ii) To study and record their unique knowledge about herbal plant name, plant part used their mode of preparation, doses and others related relevant information.

Result and Discussion

All the tribals have their dependence on forest resource for health security and livelihood; therefore, they have rich knowledge of plants and its utilization. This knowledge is transferred from one generation to another by oral discussion. Rich traditional knowledge of medicinal plants amongst local people was studied by various researchers. These plants are used by tribals either independently as crude drugs or in combination with other plants. This knowledge of tribals is gradually vanishing; hence an attempt has been made in this research work to record such knowledge for future generation. The tribes of Bastar region are known for their unique and distinctive tribal culture and heritage in all over the world. Each tribal group in Bastar has their own distinct culture and enjoys their own unique traditional living styles.

Health Institution in Bastar

Table 2 shows that there are lots of Health institution in Bastar district such as Allopathic dispensary 0.80 percent, Ayurvedic dispensary 9.54 percent, Unnani dispensary 0.20 percent; Sub Centre 73.96 percent, PHC 12.72 percent, CHC 2.58 percent and District Hospital one. The Chhattishgarh state is also served by state sponsored medical system in which Primary Health Centres (PHC) are the key units for curing different diseases. However, these centres are not adequate in the state/ and each PHC caters more than 31,000 populations against the stipulated norms of 20,000 for the hilly region. Apart from this inappropriateness in availability of PHCs in Chhattishgarh state the cost of modern medicines times higher than the cost of indigenous medicine. The low cost of herbal medicine is one of the reasons that discourage younger generation to adopt the *traditional healers/ Guinias/ Baigas* as a profession. There is a sharp decline in the number of recognized *traditional healers/ Guinias/ Baigas* in the study area, however, there are number of women and men in the villages who know the healing properties of some of the medicinal plant species. The survey indicates that the loss of knowledge on preparing medicine was due to the decline in number of *traditional healers/ Guinias/ Baigas* coming forward to adopt this traditional healing practice professionally.

Table 2: Different types of health institution in bastar district

Types of Institution	No.	%
Allopathic Dispensary	4	0.80
Ayurvedic Dispensary	48	9.54
Unani Dispensary	1	0.20
Sub Centre	372	73.96
PHC	64	12.72
CHC	13	2.58
District Hospital	1	0.20
Total	**503**	**100**

Source: CMO, District Hospital, Bastar, 2013

Table 3: Types of common disease among villagers

Types of Physical Problems	No.	%
Pain / Ache	86	3.71
Cough	192	8.28
Cold	116	5.00
Fever	72	3.10
Cough & Cold	222	9.57
Gastric Problems	121	5.22
ENT Problems	41	1.76
Gynaec Problems	242	10.44
TB	32	1.38
Malaria	118	5.09
Typhoid	45	1.94
Measles	18	0.77
Jaundice	265	11.43
Skin Disease	119	5.13
Leprosy	89	3.83
Small Pox	142	6.12
Chicken Pox	176	7.59
Others	222	9.57
Total	**2318**	**100**

Table 4: Status of traditional healer

Variables	No.	%
Inheritance from elderly person	395	87.77
Accidental detection gift from God	15	3.33
Training from the Specialist	19	4.22
Others	21	4.66
Total	**450**	**100**

Common Disease

It is clear from the table 3 that so many bacterial and viral diseases find out in Bastar where Jaundice (11.43 percent), Gynaec Problems (10.44 percent) and Cough & Cold (9.57 percent) are common.

Status of Traditional Healer

The study of ethnomedical systems and herbal medicines as therapeutic agents of a paramount importance in addressing health problems of traditional communities and third world countries as well as industrialized societies. A traditional method of using plants as a medicine was found to be prevalent in Bastar. Table 4 shows that 87.77 percent population answered that healing is inheritance from elderly person where 3.33 percent peoples opinions are accidental detection gift from God, 4.22 percent said that training from the specialist and others 4.66 percent.

Treatment was found to be done by the *traditional healers/Guinias/Baigas* and medicine man by collecting various plants and plant parts from surrounding of the forest and use them as a medicine. The drug preparation method was also found to be very orthodox despite they have treatments for all kinds of diseases people commonly suffer in Bastar. In present investigation tribals, *traditional healers/ Guinias/ Baigas* and medicine man traditional knowledge was documented about the information of 118 plants for curing diseases was documented.

Seeking Traditional Healer

It's observed from table 5 that villager's first preference is to seek traditional healer for treatment (73.33 percent). Hemadri, Koppula & Rao, S.S., 1989 reported that about 163 species of plants were used as wound healing plants in Indian system of medicine such as Ayurveda, Siddha , Unani and folk medicine. Of these only four plants like *Aloe vera, Semicarpus anacardium, Abutilon indicum* and *Macuna pruriens* were found to be used by tribals of Bastar in wound healing. Majority of young generation do not know many plants and their medicinal values.

Present study revealed such type of situation in district Bastar, therefore scientific cultivation, conservation and sustainable use of plant species by ethnic communities would be highly advantageous for socio-economic growth, in conservation of rare and endangered plants species and the indigenous knowledge for the future generations. Table 6 shows that Villagers consult to a traditional healer for Genetical Disease (0.23 percent), Gynaec Problems 8.76, Sexual Disease 4.26, Phycial Disabilities 30.33, Mental Disabilities 0.17, Body Pain 5.09, Cough 5.09,

Table 5: Seeking traditional healer for treatment

Status	No.	%
Yes	339	75.33
No	111	24.66
Total	**450**	**100**

Table 6: Diseases generally villagers consult to a traditional healer/baiga/gunia

Diseases	No.	%
Genetical Disease	4	0.23
Gynaec Problems	168	8.76
Sexual Disease	72	4.26
Phycial Disabilities	512	30.33
Mental Disabilities	3	0.17
Body Pain	86	5.09
Cough	92	5.45
Cold	116	6.87
Fever	26	1.54
Cough & Cold	87	5.15
Gastric Problems	93	5.50
ENT Problems	37	2.19
TB	12	0.71
Leprosy	89	5.27
Malaria	23	1.36
Typhoid	45	2.66
Measles	18	1.06
Jaundice	105	6.22
Skin Disease	59	3.49
Constipation	42	2.48
Others	19	1.12
Total	**1688**	**100**

Cold 6.87, Fever 1.54, Cough & Cold 5.15, Gastric Problems 5.50, ENT Problems 2.19, TB 0.71, Leprosy 5.27, Malaria 1.36, Typhoid 2.66, Measles 1.06, Jaundice 6.22, Skin Disease 3.49, Constipation 2.48 and Others (1.12 percent).

Living close to nature, the tribal people have acquired knowledge on the natural resources that exists around their habitat in the forest eco-system. These people have unique knowledge on use of different plant parts and their use in cure of ailment. These communities are using different formulations made out of plant parts in cure of ailments in primary health care. Keeping in view of vastness of forest area and richness of vegetation, systematic efforts to exploit the valuable potential is still lacking with exception to sporadic attempts being made as evident by review of literature being done for investigators earned in Chhattisgarh on traditional health care by numerous ethno- botanists such as Oomachen and Srivastava (1996).

Drug Preparation Method and Administration, Practiced by Tribal in Bastar

In present study survey was done for documentation of drug preparation and its administration method. The information regarding the drug preparation and administration was collected from 50 *traditional healers/ Gunias/ Baigas*, knowledgeable tribal women of 8 villages in Bastar district. The information was collected with the help of questionnaire and personal interview. The drug was found to prepare from independent plant or from plant parts in combination. In some of the drugs other ingredients like honey, camphor, salt and fresh milk, butter milk, curd, ghee, coconut oil, jaggery and sugar and molasses was also mixed for the drug preparation. Most of the drugs were prepared by using traditional methods like pastels and mortals. Tribals didn't found to have any modern facilities for drug preparation like grinder mixer, juicers, pulverisers and distillation unit. Drug preparation and administration method for 39 diseases have been documented.

The drug preparation methods were very old and traditional. Most of the drugs were found to be prepared either by making fine powder in pastel and mortal or paste or decoction or extract from plants were noted to be used directly. In some of the drugs it was noted that they mix other ingredients like honey, milk, curd, ghee, butter milk, jaggery, sugar, molasses, camphor, oil etc. use of similar ingredients in administration of ethno-medicine.

The administration of drug was found to be oral and in some drugs it was observed to be applied over the diseased part for quick relief. The cost of preparation for the different drugs was different, however it was observed to be less than the other methods of treatment like allopathic treatment done outside the village. The doses were noted different for 39 diseases investigated during the present study. The time taken for complete relief from the disease was also noted different for all the studied diseases. In some diseases restriction was also noted for intake of sweet, sour, cold, spicy and oily food during the period of treatment. Many drugs were advised to take in empty stomach, before and after the meals. In case of snake bite, scorpion bite and onset of pregnancy, fever and hydrocel nerve examination was found to be done by the Baidyas. Leaf chewing tests was noted for presence and absence of poison in case of snake and scorpion bite.

In view of the importance of traditional medicine which provides health services to 75-80 percent of the world population, increased demand of herbal drugs by the pharmceauticals and depleting natural plant resources, it is high time to document the medicinal utility of less known plants available in remote areas of the country .

Table 7: Drug preparation methods of ailments

1. Body ache
Common name of plant: Mahka **Botanical name:** *Aegle marmelos* **Parts of plant:** Bark **Dosage & preparation:** The fresh fruit pulp and bark of custard apple are taken in equal proportion and dried under sunlight. Fine powder is prepared with the help of grinder or mortal and pastel. 1 tea spoon of powder is taken with one cup of hot water after the meal, twice in a day, for 3-4 days. During this treatment consumption of the cold substance like cured is not allowed.
Common name of plant: Bis tendu **Botanical name:** *Diospyros ontana* **Parts of plant:** Root bark **Dosage & preparation:** The root bark of the Bistendu and fruit are dried in sunlight, and then fine powder is made and directly consumed with the salt twice in a day after the meal for 3-4 days. During this treatment period curd should not be eaten.
2. Chest pain
Common name of plant: Kahua/ Kurma **Botanical name:** *Terminalia arjuna/ Lecucas aspera* **Parts of plant:** Bark/ Wholeplant **Dosage & preparation:** Freshly collected bark of arjun is used for preparation of extract. Equal portion of the arjun bark extract and fresh plant extract of *Lecas aspera* are boiled together for 5-10 minutes in low temperature, and then small amount of jaggery is added. This drug is consumed for chest pain, 2 tea spoons twice a day for 3-4 days for complete relief.
3. Cough and Cold
Common name of plant: Pilikateri/ Ber **Botanical name:** *Argemone exicana/ Ziziphus jujube* **Parts of plant:** Flower/ Bark **Dosage & preparation:** The 10-15 dried flowers of *Argemone mexicana* and equal quantity of dried bark of *Zizphus jujube* is mixed and boiled with 1:3 water. Later it is filtered in cotton mesh. Three tea spoons filtrate with one tea spoon of honey is taken, twice a day, for two days. It gives relief from cold and cough.
Common name of plant: Adusa **Botanical name:** *Adhatoda vasica* **Parts of plant:** Leaves **Dosage & preparation:** 10-15 fresh leaves of *Adhatoda vasica* are crushed and extract is stored with equal quantity of honey in bottle. Two tea spoon extract is taken twice in a day morning and evening) for 5-6 days.50 leaves of *Adhatoda vasica* is boiled in one litter of water, volume of water is reduced to one glass and half glass of cow ghee is mixed with it. 1 tea spoon of above mixture is taken for a week interval to get complete relief from cold and cough.
Common name of plant: Tulsi **Botanical name:** *Ocimum sanctum* **Parts of plant:** Leaves **Dosage & preparation:** 25-30 fresh leaves of *Ocimum sanctum* (Tulsi) is crushed and extract is stored. One tea spoon of extract with one tea spoon of honey is taken, twice a day, for 3-5 days for complete recovery.
4. Cuts & wounds
Common name of plant: Ghritkumari **Botanical name:** *Aloe vera* **Parts of plant:** Pulp **Dosage & preparation:** 25-30 fresh leaves of *Ocimum sanctum* (Tulsi) is crushed and extract is stored. One tea spoon of extract with one tea spoon of honey is taken, twice a day, for 3-5 days for complete recovery.
Common name of plant: Bhelawa

Botanical name: *Semicarpus nacardium*
Parts of plant: Bark
Dosage & preparation: The fresh root bark of Bhelava is cleaned and crushed and same proportion of pulp of *Aloe vera,* is mixed to form a paste, then it is applied over the cuts and wounded part of the body thrice a day, for 3-4 days to get complete relief.

Common name of plant: Kanghi/ Kewanch
Botanical name: *Abutilonon indicum/ Mucuna pruriens*
Parts of plant: Roots/ Leaves
Dosage & preparation: The roots of *Abuliton indicum*, is burnt and mixed with the equal proportion of dried leaves powder of the *Macuna pruriens* and equal quantity of coconut oil and camphor is mixed in a clean pot to form a paste. This paste is applied over the cut and wounded part of the body for thrice a day, for 5-6 days for complete healing of wounds.

5. Diabetes

Common name of plant: Dhawra
Botanical name: *Anogeissuss latifolia*
Parts of plant: Bark
Dosage & preparation: Fresh bark and seed of above plant is taken in equal proportion and cleaned with the water.Both are crushed in pastel and mortal with some water, then filtered in cotton mesh. Heated over low temperature for 15 minuets then again filtration is done. Two spoons of the black salt is added and preserved in a clean bottle for two days. After two days, it is used as medicine for diabetes. Two tea spoons of this formulation twice a day with 1 cup of cold water before meal is taken for 15 days to get relief.

Common name of plant: Jamun
Botanical name: *Syzygium cuminii*
Parts of plant: Seeds
Dosage & preparation: The fresh seeds of *Syzygium cumini*, (Jamun) is washed in clean water and crushed in a pastel and mortal, then dried under the sunlight for three days. Again it is grinded and meshed in cloth to get fine powder. Little amount of jaggery is added to the preparation,then tablets of 2 grams each is formed and again dried in sun light and stored in clean bottles. Take 2 tablets twice a day in empty stomach is taken for 15 days for getting relief.

Common name of plant: Dumar
Botanical name: *Ficus glomerata*
Parts of plant: Fruit and bark
Dosage & preparation: The fresh fruit and bark of *Ficus glomerata* (Dumar) is dried to form powder of fruit and bark. One tea spoon of powder with half cup of cold water is taken empty stomach in morning once in a day for 15 days.

Common name of plant: Gudmar
Botanical name: *Gymnema sylvestre*
Parts of plant: Stem and leaves
Dosage & preparation: The dried stem and leaves of gudmar is powdered with the help of pastel and mortal.Later, it is filtered by cloth and added with liquid pulp of *Aloe vera*. The tablets are prepared and dried in the sunlight. Two tablets with half cup of hot water are taken twice a day after the meal for 15 days.

6. Delivery problem

Common name of plant: Rasna
Botanical name: *Blepharispermum subsessile*
Parts of plant: Roots
Dosage & preparation: The fresh roots of Rasna is taken and cleaned with water, then it is crushed in pastel and mortal to form a paste and paste is applied over the abdomen before delivery period. The roots of Rasna are tied over the fore head before 2 days of the delivery. Some times roots are wearing like neck less.

Common name of plant: Bach
Botanical name: *Acorus calamus*
Parts of plant: Fresh milk
Dosage & preparation: The dried powder of *Acorus calamus* and fresh milk 1:3, boiled in low flame, small quantity of sugar is added. This mixture is preserved in a cool place. One tea spoon of this medicine is taken once in a day before going to bed for 5-10 days before the delivery.

7. Dysentery

Common name of plant: Bhuiamla
Botanical name: *Phyllanthus niruri*
Parts of plant: Whole plant
Dosage & preparation: Extract of whole plant is extracted by crushing the plants in pastel and mortal, and then it is filtered in cotton mesh. Filtrate is used as a medicine. One tea spoon of filtrate is taken with honey, twice a day for 2-3 days for complete relief.

Common name of plant: Kudai
Botanical name: *Holarrhaena antidysenterica*
Parts of plant: Stem bark
Dosage & preparation: Fresh fruits of Amla are boiled in water for 5 minutes and the pulp is removed from the seed. The one part of the fruit pulp and one part of the honey is mixed well and taken thrice a day (morning evening and noon), for three days for recovery.

Common name of plant: Aithi
Botanical name: *Helicteres isora*

Parts of plant: Seeds
Dosage & preparation: The roots of the Rasna jadi collected from the forest is cleaned with help of hot water, then crushed in pastel and mortal in order to make paste. Half spoon of paste is added with one cup of the hot water and taken twice a day for two days.

Common name of plant: Amla
Botanical name: *Emblica officinalis*
Parts of plant: Fruits
Dosage & preparation: Equal number of leaves of each plant is crushed in pastel and mortal to extract juice.Extracted juice is used as ear drop thrice in a day, for three days. During the medication cold food items consumption is avoided.

Common name of plant: Rasna Jadi
Botanical name: *Blepharispermum subsessile*
Parts of plant: Roots
Dosage & preparation: The roots of the Rasna jadi collected from the forest is cleaned with help of hot water, then crushed in pastel and mortal in order to make paste. Half spoon of paste is added with one cup of the hot water and taken twice a day for two days.

8. Ear ache

Common name of plant: Harra/ Bad
Botanical name: *Terminalia chebula/ Ficus religiosa*
Parts of plant: Fruits/ Leaves
Dosage & preparation: Equal number of leaves of each plant is crushed in pastel and mortal to extract juice.Extracted juice is used as ear drop thrice in a day, for three days. During the medication cold food items consumption is avoided.

Common name of plant: Dhatura/ Andi
Botanical name: *Datura alba/ Ricinus communis*
Parts of plant: Seeds/ Fruit
Dosage & preparation: 50 gm seeds of *Dhatura* grinded with 100 gm of *Ricinus* oil, heated 10-15 minutes in low temperature. Later it is filtered in a cloth and the oil is stored in bottle. 2-3 drops of oil is used thrice a day for complete relief from ear ache. During this treatment constipating excessive pulses, exposure to sun, and intake of water soon after exposure to sun are avoided.

9. Epilepsy

Common name of plant: Mahka
Botanical name: *Aegle marmelos*
Parts of plant: Fruit
Dosage & preparation: Fruit pulp of *Aegle marmelos* is added with same proportion of milk and mixed thoroughly. Sugar is added as per the taste. 2 spoons of the formulation are given twice a day (morning and night) for 15 days.

Common name of plant: Brahmi/ Jhadrin/ Shankpushpi
Botanical name: *Bacopa monnieri/ Gloriosa superb/ Evolvulus alsinoides*
Parts of plant: Leaves/ Leaves/ Leaves
Dosage & preparation: *Bacopa monnieri* (Brahmi), *Evolvulus alsinoides* (Shankpushpi), *Gloriosa superb* (Jhagrahin) and cardemon is taken in equal proportion and grinded in patel and mortal.This mixture is stored in a bottle. ½ -1 gm of mixture with 50 gm of honey or ghee is taken twice in a day for 20 days to get substantial relief.

Common name of plant: Satawari
Botanical name: *Asparagus racemosus*
Parts of plant: Roots
Dosage & preparation: The roots of *Asparagus racemosus* (Satawari) are grinded and taken with sugar for 60 days. If a person is under attack of epilepsy, few drops of extract of root is poured in nose.The patient becomes normal

10. Eye problems

Common name of plant: Choulai bhaji
Botanical name: *Amaranthus virdis*
Parts of plant: Leaves
Dosage & preparation: The leaves of the plant are crushed and extract is filter in cotton mesh. The two drops of extract is applied in eye before sleeping in night for 5-10 days to get relief from eye problem and blindness. Some times the paste of the *Amoranthus virdis* leaves are used over the eyes before sleeping in night.

Common name of plant: Ghritkumari
Botanical name: *Aloe vera*
Parts of plant: Leaf pulp
Dosage & preparation: The leaf pulp of *Aloe vera* is applied directly over the eye in many eye problems and one tea spoon of pulp with one teaspoon of honey is mixed and taken once a day in night, for 20-25 days to get relief.

11. Eczema

Common name of plant: Atanjari/ Bhuikumhara
Botanical name: *Helicteres isora/ Pueraria tuberose*
Parts of plant: Leaves/ Leaves
Dosage & preparation: An equal quantity of leaves of *Helicteres isora* (Atanjari) and *Pueraria tuberose* (Bhuikumhara) are dried in the sunlight and grinded to make a fine powder. Later it is mixed with cow ghee and pinch of camphor is also mixed to make a paste. Prepared paste is applied over the affected part of the body. It gives relief in a week interval.

12. Fever

Common name of plant: Bach/ Giloy

Botanical name: *Acorus calamus/ Tinospora cordifolia*
Parts of plant: Root/ Stem
Dosage & preparation: The bach root and Giloy stem are taken in the same proportion and dried in sun light. Fine powder of above is made in pastel and mortal. Take half tea spoon of the powder with hot water, twice in a day (morning and evening) for three days to get relief.

Common name of plant: Bantulsi/ Adusa/ Bhuileem
Botanical name: *Eranthemum pullchellum/ Adhatoda zeylanica/ Andragrophis paniculata*
Parts of plant: Leaves/ Leaves/ Leaves
Dosage & preparation: 50 gm leaves each of *Adhatoda zeylanica, Andrographis paniculata and Eranthemum pullchellum* is grinded in 100 ml of water and jaggery is added as per the taste. Take one tea spoon of leaves extract daily morning and evening for 2-3 days. *Eranthemum pullchellum* fresh leaves extract is applied over the fore head for immediaterelief from fever.

13. Fracture

Common name of plant: Anantmool/ Harsingar
Botanical name: *Hemidesmus indicus/ Nyctanthes arbortristis*
Parts of plant: Entire plant/ Leaves and fruits
Dosage & preparation: The entire plant part of the *Hemidesmus indicus* crushed in pestle and mortal to for paste then mixed with mustard oil. The prepared paste of is applied over fracture part. Bamboo stick is tightly tied over the fracture part as plaster. After 5-6 days plaster is removed. Same way plaster is done thrice over fracture part for complete relieve.While applying plaster in fracture part, the leaves and fruits of *Nyctanthes arbor tristis*, dried in the sunlight and fine powder is prepared, then some sugar is added. Two tea spoons of powder with half tea spoon of cow ghee mixed and taken orally twice a day for 15 days till the removal of plaster.

Common name of plant: Hadjod
Botanical name: *Cissus quadrangularis*
Parts of plant: Stem
Dosage & preparation: The name of the plant is hadjor which literally means joining of bones. The stem portion of the plant is collected and cleaned with the water. Paste is prepared by crushing in pastle; a little amount of camphor is added. The hairs are removed over the affected part and fractured bone is properly joined and paste is applied. Later plaster of bamboo sticks is tied over affected area. After 5-6 days plaster is removed. Similarly plaster is done in 15 days approximately. Bone is broken in to 15-20 pieces can be joined in this way.

14. Giddiness

Common name of plant: Tulsi**B**
otanical name: *Ocimum basilicum*
Parts of plant: Entire plant
Dosage & preparation: The above plant is dried under sun light and powdered. This powder is dipped in one glass of water for whole night, in morning it is filtered by using cotton mash and waste part is removed. One cup of filtrate is taken in empty stomach, for thrice a day, for 5-6 days.

15. Head-ache

Common name of plant: Keokand
Botanical name: *Costus speciosus*
Parts of plant: Rhizomes
Dosage & preparation: The rhizomes of keokand collected from forest are crushed in pastel and mortal and extract is stored in the bottle. One tea spoon extract is taken with honey twice a day for two days to get complete relief. Some times paste of fresh leaves is applied over forehead for getting instant relief.

16. Hydrocel

Common name of plant: Jangli haldi/ Bhelava
Botanical name: *Curcuma amada/ Semicarpus anacardium*
Parts of plant: Rhizomes/ Seeds
Dosage & preparation: The rhizomes of *curcuma amada* are crushed and extract is heated with same proportion of mustard for one hour. The mixture is applied over the affected part, twice a day for five to seven days. Simultaneously, the seeds of the *Semicarpus anacardium* (Bhelava) is heated with mustard oil and tied over the left or right arm for seven days the size reduces. The sour substances like tomato and curd are strongly restricted in during the period of treatment.

Common name of plant: Arandi
Botanical name: *Ricinus communis*
Parts of plant: Leaves
Dosage & preparation: The mature leaves of *Ricinus communis* is heated with Karanji oil. These leaves are directly applied in affected area for 10-15 times in evening for three days. During this treatment half teaspoon of *Ricinus communis* seed oil is also consumed with jaggery for three days to get relief.

17. Irregular Menses

Common name of plant: Dhawai/ Gudahal
Botanical name: *Woodfordia fruticosa* Dhawai/ *Hibiscus rosa-sinensis* Gudahal
Parts of plant: Corolla/ Flower
Dosage & preparation: An equal portion of fresh corolla of Dhawai and Gudahal is crushed to make a paste. One tea spoon of the paste is dissolved in one cup of hot milk and some sugar is added and taken twice in a day for 15 days to overcome the problem.

18. Itching

Common name of plant: Chitrak/ Nirgundi

Botanical name: *Plumbago zeylanica/ Vitex negundo*
Parts of plant: Entire plants/ Entire plants
Dosage & preparation: Both the plants are crushed to get extract and are mixed with mustard oil and pinch of camphor. This mixture is applied on affected part of the body, twice a day for a week to get complete relief.

19. Jaundice

Common name of plant: Muli/ Amar bel
Botanical name: *Raphanus sativus/ Cuscuta reflexa*
Parts of plant: Leaves/ Leaves
Dosage & preparation: Raphanus sativus (Muli) leaves are grinded with same portion of Cuscuta *reflexa* plant in pastel and mortal and extract is collected in the bottle. One tea spoon extract with pinch of sugar is taken twice in a day for 7 days to get relief from jaundice.

Common name of plant: Bhui Amla/ Saan/ Chirchita
Botanical name: *Phyllanthus nirurai/ Crotalaria sericea/ Achyranthes aspera*
Parts of plant: Whole plant/ Leaves/ Roots
Dosage & preparation: Whole plant of *Phyllanthus nirurai* (Bhui Amla) and leaves of *Crotalaria goreensis* (Saan) are powdered and tablets are prepared by mixing molasses. Two tablets are taken with half cup of curd in empty stomach in morning and evening for 7 days to get relief from the Jaundice. The roots of *Achyranthes aspera* is tied over the neck for 7-8 days for early recovery from jaundice.

Common name of plant: Mehandi/ Mahaleem
Botanical name: *Lawsonia alba/ Melia azadirach*
Parts of plant: Leaves/ Bark
Dosage & preparation: The leaves of Lawsonia inermis (mehandi) and bark of Melia azedarach 1:1 is taken for the preparation of decoction. Decoction is kept for the whole night and taken in the morning and evening with some sugar for 7 days to get relief from jaundice.

Common name of plant: Char/ Kahava
Botanical name: *Buchanania lanzan/ Terminalia arjuna*
Parts of plant: Bark/ Bark
Dosage & preparation: The bark of two plants are taken in same proportion and dried in sun light then it is powdered in pastel and mortal. The half tea spoon of this powder is taken with one teaspoon of curd, twice in a day (morning and evening), for ten days.

Common name of plant: Sarpokha/ Mahua
Botanical name: *Tephrosia purpurea/ Madhuca latifolia*
Parts of plant: Whole plant/ Bark and seed
Dosage & preparation: Mix the *Tephrosia purpurea* whole plant and bark and seed cake of *Madhuca latifolia* 1:1:1 and dried under sun light. A fine powder is prepared by grinding in pastel and mortal. One teaspoon of the powder is taken with one cup of buttermilk, once in a day in empty stomach for seven days to get complete relief.

20. Joint Pain

Common name of plant: Shatavari
Botanical name: *Asparagus racemosus*
Parts of plant: Roots
Dosage & preparation: The roots of shatavri were collected from forest and cleaned with hot water. The central part of root is removed and chopped in to small pieces. One portion chopped root with three portion water is boiled till the volume reduces to half, then jaggery or sugar is added as per the taste and consumed orally 2-3 tea spoons daily with milk for 15-16 days.

Common name of plant: Nirgundi/ Karanji
Botanical name: *Vitex negundo/ Pongamia pinnata*
Parts of plant: Root, stem and leaves/ Root, stem and leaves
Dosage & preparation: Root, stem and leaves of the plants are freshly collected and cleaned with water, plant parts are grinded with help of pestle and mortal, and then it was filtered with the help of cotton cloth. The filtrate is boiled along with equal portion of pongamia oil for 15-30 minutes till the formation of vapor, the extract of plant mixes in oil. Camphor is added to avoid bitter smell. This oil is applied over the joint of the body twice in a day for one month.

Common name of plant: Keokand
Botanical name: *Costus speciosus*
Parts of plant: Rhizome
Dosage & preparation: The rhizome of Costus is collected from the forest and washed with water, then it is grinded with the help of pestle and mortal. Grinded rhizome is filtered with the help of cotton mesh. 2-3 spoon filtrate of the plant is consumed twice a day for 10-15 days.

21. Kidney Stone

Common name of plant: Pathribhaji
Botanical name: *Boerhaavia diffusa*
Parts of plant: Leaves
Dosage & preparation: The leaves extract of *Boerhavia diffusa* is directly taken by the person in empty stomach,in morning, after one hour 1-2 glass of fresh water is consumed for dissolving stone. This treatment is done for 15 days. The kidney stone is completely get dissolved.

Common name of plant: Kulthi
Botanical name: *Mycrotyloma uniflorum*

Parts of plant: Seeds
Dosage & preparation: The plant part of Kulthi is crushed and extract is taken out. One tea spoon of extract with one tea spoon of water is taken twice a day, for 10-15days. Simultaneously the kulthi seeds are boiled with water and filtered in cotton mesh. The filtrate is taken one glass in empty stomach, in morning, for 30 days.

22. Leucorrhoea

Common name of plant: Palas/ Anar
Botanical name: *Butea monosperma/ Punica granatum*
Parts of plant: Flowers/ Flowers
Dosage & preparation: An equal proportion palas and anar flowers are dried in sun light and powdered in pastel and mortal. The powder is preserved in a pot with a little portion of black salt. One tea spoon of the powder with one tea spoon of cow ghee is taken once in a day before sleeping in night, for 6-8 days for relief.

Common name of plant: Ramdatun
Botanical name: *Smilax macrophylla*
Parts of plant: Stems
Dosage & preparation: The fresh stems of *Smilax macrophylla*, (Ramdatun) is cut in to small pieces and dried in sun light. Dried stem is powered and boiled with 3:1 water. Volume is reduced to one part then honey is added as per the taste. This decoction is used three spoons twice a day in empty stomach for five days.

23. Malaria

Common name of plant: Bhuineem/ Giloy/ Neem
Botanical name: *Andrographis paniculata/ Tinospora cordifolia/ Azadiractaindica*
Parts of plant: Whole plant/ Stem/ Bark
Dosage & preparation: Take the equal proportion of Bhuineem whole plant, Giloy stem and bark of the Neem. 3 times of water is added and boiled over the low flame, till the volume is reduced to 1 portion. After cooling it is filer in a cotton cloth. Half cup of this extract with sugar or honey is taken in morning for five days for complete relief. This formulation is also consumed in the form of tablets, popularly known amongst tribal as malariya goti. The method of preparation of malaria goti is same. The 3-5 tablets are taken with the hot water or milk for five days for recovery from malaria.

24. Male Impotency

Common name of plant: Thelka/ Tejraj
Botanical name: *Alangium salviifolium/ Peucedanum nagpurense*
Parts of plant: Entire plants/ Entire plants
Dosage & preparation: The plant parts of these plants are taken in equal proportion and crushed to make paste.One tea spoon of paste with one cup of cow milk is taken twice a day for 5-10 days for getting relief.

25. Milk secretion

Common name of plant: Anantmul/ Satawri
Botanical name: *Hemidesmus indicus/ Asparagus racemosus*
Parts of plant: Roots/ Fibre
Dosage & preparation: The fresh roots of *Asparagus racemosus* and *Hemidesmus indicus* is cleaned with the water and central fibre of the satawri is removed and chopped in to small pieces then boiled for half an hour. The boiled root and its extract in water is directly taken with one cup of fresh milk and sugar, twice a day (morning and evening) for 5-10 days. In two to three days of consumption milk secretion increases.

Common name of plant: Dudhi
Botanical name: *Euphorbia hirta*
Parts of plant: Whole plant
Dosage & preparation: The whole plant of the Dudhi is cleaned with fresh water and extract of the plant is added with the same proportion of fresh milk and honey. This formulation is taken by the lady once in a day before sleeping in the night, for 5-6 days to get increase in milk secretion.

26. Onset of Pregnancy

Common name of plant: Keokand
Botanical name: *Acorus calamus*
Parts of plant: Roots
Dosage & preparation: The roots of *Acorus calamus* are dried under sun light and powdered in pastel and mortal. One tea spoon powder is given with half tea spoon ghee to both males and females by the baidya in Devguri (sacred place) outside the village. The powder is taken once in a day before going to bed for 10-15 days.

27. Painful menses and excessive blood discharge

Common name of plant: Mahka/ Satawri
Botanical name: *Aegle marmelos/ Asparagus racemosus*
Parts of plant: Root/ Root
Dosage & preparation: The dried root of *Asparagus racemosus* equal proportion of dried fruit pulp of *Aegle marmelos* powdered in pastel mortal. One tea spoon of powder is taken with one cup of hot milk once in a day for 5-6 days. The cost of treatment is Rs. 50/ episode.

Common name of plant: Jhagrin
Botanical name: *Gloriosa superb*
Parts of plant: Root
Dosage & preparation: The small pieces of Jhagrin root dipped in to butter milk for two days, then roots are removed from honey and dried in the sunlight. The one piece of dried root is taken with one cup of milk, twice in a day for 5-6 days.

Consumption of cold water and food, excessive intake of sweet and sour food are avoided.

28. Paralysis

Common name of plant: Akarkara
Botanical name: *Spilanthes oleracea*
Parts of plant: Entire plants
Dosage & preparation: The plant parts of Akarkara are crushed with water and extract is collected. One tea spoon extract is taken with honey twice a day, for one month to get complete recovery.

Common name of plant: Siris/ Sehra
Botanical name: *Albizzia lebbek/ Bauhinia retusa*
Parts of plant: Barks/ Barks
Dosage & preparation: Barks of above two plants are taken in equal proportion and powdered in pastel and mortal. One tea spoon of the powder is taken with one cup of hot water, twice a day (morning and evening) for one month for getting relief.

29. PilesCommon name of plant: Tillai/ Bargad
Botanical name: *Wendlandia exserta/ Ficus benghalensis*
Parts of plant: Barks/ Fruits
Dosage & preparation: The bark of Tillai and dry fruits of Bargad in equal proportion is powdered. The one tea spoon of this powder is taken with one cup of butter milk, twice in a day for 15 days.. It gives complete relief to patients of chronic piles.

Common name of plant: Farsa/ Modga
Botanical name: *Butea monosperma/ Lannea grandis*
Parts of plant: Gum/ Bark
Dosage & preparation: The gum of the *Lannea grandis,* (Modga) and Butea monosperma (Farsa) bark is taken in equal quantity, dried under the sun light and powdered. The powder is mixed with cow ghee to form paste. This paste is applied over the knots of piles for a week. The knots are dissolved and patient gets quick relief.

Common name of plant: Tillai/ Fatera
Botanical name: *Wendlandia exserta/ Gardenia turgida*
Parts of plant: Bark/ Bark
Dosage & preparation: The bark of Tillai and Fatera is powdered. Powder and cow ghee is mixed to make paste. The paste is applied over the knot of piles and tied by thread. In a week interval patient gets relief from piles. The cost of treatment is Rs. 70/ episode.

Common name of plant: Zimikand
Botanical name: *Amorphophallus paeonifolius*
Parts of plant: Root
Dosage & preparation: Dried root of zimikand is powdered and a pinch of black salt is mixed. Equal quantity of molasses (sugar cane juice) is added to make tablets of 5 gm each. 3 tablets are taken twice a day for one month to get complete relief.

30. Respiratory Disorder (Asthma)

Common name of plant: Amla/ Amarbel
Botanical name: *Emblica officinalis/ Cuscuta reflexa*
Parts of plant: Fruits/ Fruits
Dosage & preparation: The fruit pulp of *Emblica officinalis* and *Cuscuta reflexa* in equal quantity is dried in the sunlight for three days, then grinding is done to prepare fine powder. One tea spoon of this powder is taken with one tea spoon of honey; twice in a day (morning and evening) for 10-15 days gives quick relief.

31. Stomach Pain

Common name of plant: Bargad
Botanical name: *Ficus religiosa*
Parts of plant: Leaves and fruits
Dosage & preparation: The fresh leaves and fruits of bargad, is boiled with 1:4 water over low flame, then it is cooled and sugar is added. One tea spoon of this decoction is taken with one glass of water in empty stomach for three to five days to get complete relief.

32. Swelling

Common name of plant: Nirgundi
Botanical name: *Vitex negundo*
Parts of plant: Entire plants
Dosage & preparation: The plant parts of Nirgundi is crushed with water and boiled for 15 minutes, and then it is filtered by using cotton mesh. Now in same proportion of filtrate, Karanji oil is heated in a pot and filtrate is mixed and boiled till the formation of vapours then, pinch of camphor is added and stored in clean bottle. This Nirgundi oil applied over the affected part with the help of soft hands or with cotton cloth. This is done twice a day for 3 days, swelling gets disappeared.

33. Snake bite

Common name of plant: Bhuileem / Sarpagandha
Botanical name: *Andrographis paniculata/ Rauvolfia serpentina*
Parts of plant: Entire plants/ Roots
Dosage & preparation: An equal quantity of *Andrographis paniculata* plant and fresh roots of *Rauvolfia serpentina* is crushed with water to make paste. One part of paste is used directly, while second part is boiled with water for 15 minutes. One cup of this decoction is taken and paste is applied over the snake bite part of the body. Simultaneously baidya perform snake bite test by giving the fresh leaves of the *Rauvolfia serpentina* for chewing, if it tastes bitter then poison has completely excreted from the body and if it does not taste bitter the poison is in the body. This treatment is done by the Baidya for snake bite of poisonous snake like Karayt and kobra in Bastar. This treatment gives complete relive in one hour of the snake bite..Beside that Baidyas

of Bastar take leaves of *Madhuca indica* (Mahua) and rub over the snake bite person from top to bottom for 5-10 times, this also gives relief in case of snake bite.

Common name of plant: Gunji/ Khas
Botanical name: *Abrus precatorius/ Vetivera zizanoides*
Parts of plant: Whole plant/ Whole plant
Dosage & preparation: The whole plant of *Abrus precatorius* and *Vetivera zizanoides* are crushed with water to remove extract. One tea spoon of extract is taken with hot water in every half an hour interval; it gives relief in case of snakebite.

Common name of plant: Jhagrin
Botanical name: *Gloriosa superba*
Parts of plant: Roots
Dosage & preparation: Fresh roots of *Gloriosa superba* is chopped in to small pieces and boiled with the water and filtered in cotton mesh. Filtrate is mixed with sugar /jaggery. One tea spoon of this decoction with one tea spoon of ghee, in interval of one hour. Snake poison is completely getting removed within the 2-3 hours.

34. Scorpion Bite

Common name of plant: Manjita
Botanical name: *Rubia cordifolia*
Parts of plant: Leaves
Dosage & preparation: Either fresh leaves of *Rubia cordifolia* is directly consumed by the person or fresh leaves are crushed and extract is taken in one tea spoon with pinch of black salt in every half an hour interval. The poison of scorpion is excreted from the body.

Common name of plant: Peng
Botanical name: *Celastrus paniculata*
Parts of plant: Seeds
Dosage & preparation: The dried seeds of *Celastrus paniculata* are grinded and paste is formed with little water.Paste is applied in stung part of the body, for twice in one hour.

35. Sexual diseases

Common name of plant: Bhilari
Botanical name: *Peucedanum nagpurense*
Parts of plant: Leaves
Dosage & preparation: The dried leaves of Bhilari is powdered and filtered in cotton mesh. Powder and water is mixed in 1:3 and kept for two nights, then supernatant water is removed and preserved in a clean bottle. The three spoons of this decoction is taken with one tea spoon of honey, twice a day for 5 to 6 days for relieving any type of sexual diseases.

Common name of plant: Safed musli/ Kali musli
Botanical name: *Chlorophytum tuberosum/ Curculigo orchioides*
Parts of plant: Roots/ Roots
Dosage & preparation: An equal quantity of fresh roots of safed musli and kali musli is crushed in pastel and mortal to form paste. One tea spoon of paste with one tea spoon of honey is taken thrice in a day (morning, noon and evening) for 10 to 15 days to get relief.

Common name of plant: Jhagrin
Botanical name: *Gloriosa superba*
Parts of plant: Roots
Dosage & preparation: The small pieces of Jhagrin root dipped in to honey for two days, then roots are removed from honey and dried in the sunlight. The one piece of dried root is taken with one cup of water, twice in a day for 5-6 days. Consumption of cold water and food, excessive intake of sweet and sour food are avoided.

36. Tooth ache and Pyorrhea

Common name of plant: Ramdaton
Botanical name: *Smilax macrophyla*
Parts of plant: Whole plant
Dosage & preparation: The whole plant is crushed to take out extract, black salt and clove oil is added to make paste and is applied over the affected teeth and gum for once in a day, for 4 days to get complete relief. During the medication intake of cool and very hot, sour, spicy or oily food is avoided. The cost of treatment occurred Rs. 50/ episode. The soft stems of *Smilax macrophyla* is also used as tooth brush, this also gives relief from toothache and pyorrhoea.

Common name of plant: Koliyapad
Botanical name: *Dioscorea daemona*
Parts of plant: Whole plant
Dosage & preparation: The whole plant of the *Dioscorea daemona* is crushed and boiled in 1:3 water, then black salt and pinch of powder of *pipper nigrum* is added. The mixture is allowed to get cool. This mixture is used for gargling twice a day, for 15 days gives relief from toothache and pyorrhoea. The steam of plant *Dioscorea daemona* is inhaled to get relief from toothache.

Common name of plant: Sarponkha
Botanical name: *Tephrosia purpurea*
Parts of plant: Whole plant
Dosage & preparation: The whole plant of *Tephrosia purpurea* is crushed and used as a tooth paste. The twigs are also used as a tooth brush; both of them give relief from toothache.

37. Tuberculosis

Common name of plant: Bhelwa
Botanical name: *Semicarpus anacardium*

Parts of plant: Seeds
Dosage & preparation: The equal proportion of seeds and bark dried in sunlight for five days till the removal of oil then seeds are grinded to form powder. One tea spoon of powder is mixed in one tea spoon of honey and taken twice in a day for 15-20 days to get relief from tuberculosis. During this treatment cold and sour substance are restricted to eat.

38. Weakness

Common name of plant: Keokand/ Satawri
Botanical name: *Costus speciosus/ Asparagus racemosus*
Parts of plant: Roots/ Roots
Dosage & preparation: An equal quantity of the roots of keokand and satawri are crushed and boiled in 1:4 water.Boiling is done till the reduction of volume to half, then again it is boiled with sugar 1:3 till the formation of granules. The granules are stored in clean bottles. This preparation is known as Satawari kalpa. The one teaspoon of satawari kalp is taken with one cup of milk, twice in a day to overcome weakness.

39. Worms

Common name of plant: Madar
Botanical name: *Calotropis procera*
Parts of plant: Roots
Dosage & preparation: The fresh roots of *Calotropis procera* is crushed with water and filtered in cotton mesh.Half tea spoon of this extract with one tea spoon of honey is taken twice a day for three day to get relief from worms

Common name of plant: Kurai
Botanical name: *Holarrhena antidysenterica*
Parts of plant: Bark
Dosage & preparation: The bark of the *Holarrhena antidysenterica* is crushed with water and filtered by cotton mesh. One tea spoon of the extract is taken with one tea spoon twice a day, for 3-5 days to recover from worms problem.

Common name of plant: Kewanch
Botanical name: *Mucuna pruriens*
Parts of plant: Leaves
Dosage & preparation: 30-50 leaves of *Mucuna pruriens* (Kewach) with 5 grains of black pepper is grinded to form powder and is taken with water for twice a day for 3 days. It gives relief from the worm problem. The leaves and hairs of *Mucuna pruriens* (Kewach) is dried in sunlight and powdered in pastel and mortal. Powder is added with molasses to form small tablets. 2 tablets with one cup of water are taken for two to three days. Worms get completely destroyed.

Recommendations

To integrate the tribals alienated from traditional practices of forest conservation, it is essential to strengthen the tribal institutions which are many instances. A place for traditional herbal remedies in the health care system will be established only if recommendations for their use are based on studies that make them credible and acceptable.

- Maintaining Indigenous Medicine's Autonomy from the State Government Control throughout the discussions is *traditional healers / Baigas/ Gunias.*
- Developing Appropriate Policies and Protection for Indigenous Knowledge between health agencies, researchers and interested parties.
- Capacity Building training programmes, exposure visits and mass awareness campaign should be conducted.
- Mass Awareness Campaign for sensitizing the NTFPs/MAPs collectors to stop destructive harvesting of NTFPs/MAPs and overcome from the exploitative marketing. In this context workshop should be conducted at the presenting activities covering folk songs and plays related to the campaign. Posters and pamphlets should also be distributed amongst the villages.
- Marketing linkages are to be developed by contacting traders, *traditional healers/ Baigas/ Gunias,* pharmaceutical companies, Govt. departments (CGMFP Federation, Khadi Gram Udyog Kendra) etc.
- Mentorship between Youth and *traditional healers/ Baigas/ Gunias* felt that they were losing valuable knowledge because there was no interest from youth in learning Indigenous knowledge or pursuing careers as medicine people. It was suggested that schools could credit young people for apprenticing with *traditional healers/ Baigas/ Gunias.*
- Indigenous Medicine and Knowledge are Colonized. The need to assist in nurturing a healthy respect for traditional medicine by health care providers/ leaders and community is essential.
- *Ttraditional healers/ Baigas/ Gunias* thought school is where they should be learning about good diets and traditional knowledge of medicines.
- Conservation Practices of medicinal plants of Tribals in Bastar as they know the value of plants in their life. They also know this fact that plants in forest have great importance in their livelihood and health security; hence they have learnt the sustainable use of their forest resource.

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Conclusion

The use of plant species as remedies is probably as ancient as men itself or the most part, the knowledge of medicinal plants is still transmitted orally. This research study will provide adequate view to academics and researchers working on the promotion and restoration of Indigenous Knowledge Systems (IKS) of tribal communities of India as well as in world. Globally, about 85 percent of the traditional medicines were used for primary health care which are derived from plants. There is a need to document the indigenous knowledge related to Indian herbs and plants and their medicinal and other uses and convert it into easily navigable computerize data base for easy access and to secure patenting rights; to discourage other countries for patenting Indian heritage; to transfer knowledge to all sectors who are interested to know about our Indian Systems of Medicine; most of our knowledge is in Sanskrit, Arabic, Persian and other classical languages, which needs to be translated to other modern languages. It has been realized that medicinal herbs are going to play an important role in future material. These herbal drugs provide strength to the body organs and stimulate normal functioning. The herbal drugs act selectively and gently without disturbing other system. Whereas, modern medicine affects several metabolic activity in the human system and has side effects which makes body more susceptible to other diseases. It is anticipated that some significant conclusions have been emerge from the study. What can be generally surmised at this stage, are some of the broader implications and expected contributions of the research. First, over the last decade or so, increasing interest in traditional knowledge, particularly regarding medicinal plants, has been fraught with debates regarding intellectual property and traditional resource rights. Often, driven primarily by interests and forces external to indigenous communities, these remain extremely complex and indeed, urgent issues with which policy maker and stakeholders from both the North to South and East to West are actively grappling in various international floras. But this highly politicized focus at the global level seems to have diverted research attention away from the local context, i.e. from a real understanding of the actual and potential roles of traditional health knowledge and practices in addressing arguably the most urgent health care needs of growing populations in resources constrained developing countries like India. Hence, it is hoped that the present study and others like it can, in the first instance, help to redirect some research attention to the community level. Second, as this study has demonstrate, at least in the context of rural communities in Bastar District of Chhattisgarh of India, traditional knowledge regarding the use of medicinal plants is far from being a corpus of wisdom or expertise generally presumed to be restricted to the male dominated elite of professional traditional health practitioners. Indeed, most of the traditional treatments used in the communities studied are collected, prepared and administered by ordinary men and women at the household level. Hence, this implies that those 70 percent of the population, who are said to rely on traditional plant derived medicines, do not invariably consult professional practitioners. Indeed, the fact that traditional health knowledge is so pervasive and the use of local medicinal plants so widespread has paramount implications, which simply cannot be ignored by those concerned with health development and practitioner in the closely allied field of natural resources management. Finally, it has become evident that research and development efforts must also aim to identify and address the challenges and threats faced by traditional health knowledge systems, in Bastar. The ultimate goal is to strengthen and improve this vast knowledge base for the benefit of the great majority of the developing world who have survived on it for centuries and will continue too do so into the foreseeable future. It can be concluded that the local and tribal people of Bastar district have very good knowledge on the use of medicinal plants. But such knowledge of medicinal plants is restricted to a few persons. Therefore it is necessary that suitable requirements are needed in order to protect the traditional knowledge in particular area with reference to medicinal plant utilization and it was found that traditional ethno-medicine still persists among the tribal's in Bastar District of Chhattisgarh.

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Original Article

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Anthropometric Indicators as Predictor of Hypertension in Immigrant Tamil Women

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Abstract

The purpose of this study was to evaluate the abilities of WC, WHR, BMI and WSR as anthropometric indices to assess and predict hypertension in immigrant Tamil women. A total of one hundred adult immigrant Tamil women from Kolkata, West Bengal, India were evaluated in the present cross-sectional study. Bio-social data (age and ethnicity), anthropometry (stature, weight, minimum waist circumference and hip circumference)and blood pressure (systolic blood pressure and diastolic blood pressure) measurements were obtained. Body mass index (BMI), waist hip ratio (WHR) and waist stature ratio (WSR) were subsequently derived. Statistical analysis includes receiver operating characteristics curve and logistic regression. The results revealed that apart from the WHR and BMI, area under the ROC curves of waist circumference (WC) and WSR were significantly higher. However, area under the ROC curve for WSR (AUC 0.630, 95% CI 0.515 to 0.745, $p<0.05$) was slightly larger than WC (AUC 0.629, 95% CI 0.516 to 0.742, $p<0.05$) in assessing hypertension. Odd ratios of BMI and WHR were also lower than that of WC and WSR. Odd ratio associated with a 1 cm increase in WC was 1.80 (95% CI: 1.09 to 2.98, $p<0.05$) and a 0.1 unit increase in WSR was also 1.80 (95% CI: 1.07 to 3.03, $p<0.05$). The result of the present study showed that both WC and WSR had similar efficacy and were superior to both BMI and WHR. Among different anthropometric indicators of obesity WSR could be a useful screening tool for predicting hypertension.

Keywords: Anthropometry; Obesity; Hypertension; Immigrant; Tamil; Waist Stature Ratio.

Introduction

Hypertension is currently the leading risk factor for death and disability worldwide and accounted for 9.4 million deaths and 7 per cent of disability adjusted life years (DALYs) in 2010 [1]. According to World Health Organization (WHO) by 2025 the global burden of hypertension will increase by 60%, including 1.56 billion individuals [2]. It is ranked third most important risk factor for attributable burden of disease in south Asia [3]. Hypertension is directly responsible for 57% of stroke deaths and 24% of all coronary disease deaths in India. A rough estimate shows that there are 31.5 million hypertensive in rural and 34 million in urban Indian population [4,5].

It is well known that both general and central obesity are positively associated with hypertension risk [6,7]. However, controversy remains regarding the best predictor of hypertension [6,8]. There are different ways of measuring obesity. Anthropometrically derived measurements like body mass index (BMI), waist circumference (WC), waist hip ratio (WHR), waist stature ratio (WSR) are widely used in epidemiological studies [6-8], as they can be determined easily at low cost and also can be used in a larger sample [9].

In India, large number of studies has been done to

understand the association of obesity measures with hypertension in native, but in general, studies in immigrant are scarce [7, 10]. Studies among emigrant populations demonstrated higher prevalence of obesity and other cardio vascular disease (CVD) risk factors including hypertension [10,11]. It has been recently suggested that the rising burden of hypertension, associated CVD and non-communicable diseases (NCD) in India needs to be addressed as a public health priority [12]. In view of the above, the purpose of this study was to evaluate the abilities of WC, WHR, BMI and WSR as anthropometric indices to assess and predict hypertension in immigrant Tamil women.

Materials and Methods

The present cross-sectional study was conducted at Kolkata, West Bengal, India. A total of one hundred nineteen adult Tamil women were measured, out of them nineteen women were excluded because of missing data. Thus, the final sample size was one hundred adult Tamil women. Informed consent was obtained from all participants before the work commenced. All participants were asked to complete a questionnaire that included specific information on age and ethnicity. Anthropometric measurements viz. stature (ST), weight (WT), WC, hip circumference (HC) was taken following standard techniques [13]. In brief, all measurements were taken with little clothing and barefooted. During the measurement of ST, the subject stands on a flat surface with the head in Frankfurt Horizontal Plane. WT was measured with the subject stands still over the center of the platform of weighing machine with body weight evenly distributed between both feet. WC was measured at the level of the natural waist, which was the narrowest part of the torso. HC was measured at the level of maximum extension of the hip. WHR, BMI and WSR were calculated subsequently. ST was measured to the nearest 0.1 cm using moveable anthropometer. Circumference measurements were made to the nearest 0.1 cm using inelastic steel tape. WT was measured to the nearest 0.5 kg using weighing machine. Systolic blood pressure (SBP) and diastolic blood pressure (DBP) measurements were taken following standard procedure [14]. Hypertension (SBP $\geq$ 140 mmHg and/or DBP $\geq$ 90 mmHg) was defined according to the Seventh Report of the Joint National Committee (JNC-7) recommendation [15].

Descriptive statistics were performed by mean and standard deviation (SD). Areas under the receiver operating characteristic (ROC) curves were calculated to understand the ability of anthropometric measures to assess hypertension. To understand the association of anthropometric measures with hypertension, we calculated odd ratios (ORs) for each measurement in simple logistic regression analysis. Statistical analysis was performed using the SPSS (version,20.0). A p-value of < 0.05 was considered as significant.

Results and Discussion

The study participants included one hundred adult immigrant Tamil women aged between 21-70 years and the mean age was 46.59 years (SD±13.17 years). The mean and standard deviation of anthropometric and blood pressure variables are presented in Table 1. The prevalence of hypertension in the studied population was 36.97%. Similar to the present study, high prevalence of hypertension was also observed in an urban North Indian study [16]. However, in the present study we analyzed the usefulness of anthropometric indices as predictors of hypertension. The result (Table 2) revealed that apart from the WHR (AUC 0.557, 95%CI 0.440 to 0.673, $p>0.05$) and BMI (AUC 0.607, 95%CI 0.493 to 0.721, $p>0.05$), area under the ROC curves (Figure 1) of WC and WSR were significantly higher than the non-effect value 0.5. Thus, suggesting that anthropometric indices that reflect central obesity are better for predicting hypertension than general obesity measure.However, the area under the ROC curve for WSR (AUC 0.630, 95% CI 0.515 to 0.745, $p<0.05$) was slightly larger than WC(AUC 0.629, 95% CI 0.516 to 0.742, $p<0.05$) in assessing hypertension. A recent study [8] in Korean population also observed smaller area under the ROC curve for BMI than central obesity measures like WC and WSR. Similar to area under the ROC curves, OR of BMI (OR 1.45, 95% CI 0.88 to 2.38, $p>0.05$) was also lower than those for central obesity measures like WC and WSR (Table 3). The odd ratio associated with a 1 cm increase in WC was 1.80 (95% CI: 1.09 to 2.98, $p<0.05$) and a 0.1 unit increase in WSR was also 1.80 (95% CI: 1.07 to 3.03, $p<0.05$). This finding is in accordance with a previous comparative study[8] on the association between obesity measures and hypertension. Like in the present study, other studies in Asian Indians also revealed that BMI was not a useful measure for cardiovascular disease risk factors [17,18]. The lack of association between BMI and hypertension in the present study might be due to the fact that, BMI takes into account the overall adiposity andAsian Indians have a tendency towards more abdominal adipose

tissue deposition [19]. Though, WHR is a widely used measure of central obesity, no significant association was observed with hypertension in the present study. Recent study in North Indian population [20] and Taiwanese population [21] also observed comparatively weaker assessment ability of WHR for hypertension among different anthropometric indices. Studies demonstrated that WHR was largely influenced by skeletal structure and correlated poorly with central adiposity [22,23]. WHR do not reflect the height of the subject and accurately identifying the point of maximal protrusion of the buttocks in obese people is demanding [8]. Moreover, HC changes reflected changes in the bones and muscles more than changes in fat [24,25]. The result of the present study showed that both WC and WSR had similar efficacy and were superior to both BMI and WHR. Similar association was also observed by Tseng et al [21]. Though, the discrimination ability of WSR was similar to that of WC, WSR has some

Table 1: Characteristics of the studied population

Variables	Mean	SD
Age (year)	46.59	13.17
HT (cm)	151.41	6.72
WT (kg)	53.27	11.45
WC (cm)	79.23	9.38
HC (cm)	94.56	9.28
WHR	0.83	0.06
WSR	0.52	0.06
BMI (kg/m^2)	23.11	4.09
SBP (mm/hg)	134.52	7.96
DBP (mm/hg)	86.40	9.07

Table 2: Area under the ROC curves of anthropometric measures in assessing hypertension

Variables	AUC#	95% CI		*p*
		Lower Bound	Upper Bound	
WC (cm)	0.629	0.516	0.742	0.027
WHR	0.557	0.440	0.673	0.333
BMI (kg/m^2)	0.607	0.493	0.721	0.066
WSR	0.630	0.515	0.745	0.026

#Area under the curve

Table 3: Odd ratios of anthropometric measures for hypertension

Variables	OR#	95% CI		*p*
		Lower bound	Upper bound	
WC (cm)	1.80	1.09	2.98	0.02
WHR	1.26	0.79	2.02	0.33
BMI (kg/m^2)	1.45	0.88	2.38	0.14
WSR	1.80	1.07	3.03	0.03

#Odd ratio

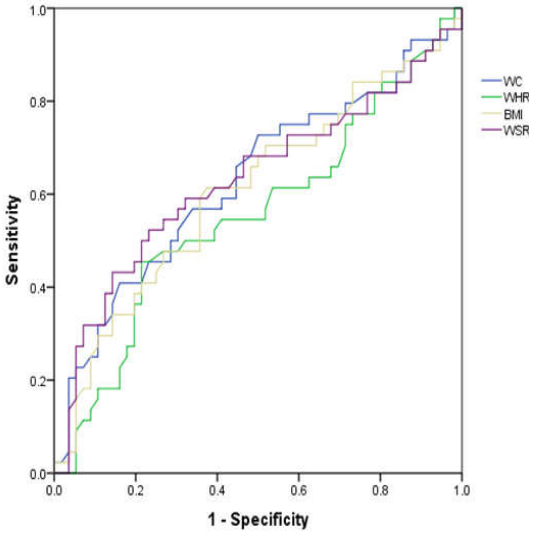

Fig. 1: Area under the ROC curves assessing hypertension

extra benefits like, unisex cutoff within a narrow range [21], user-friendly, consider stature of the subject and can be used in children also [8].

Thus in conclusion, among different anthropometric indicators of obesity WSR could be a useful screening tool for predicting hypertension. Since the present study is cross-sectional in nature and restricted to females, further investigations considering all obesity measures on the males as well as in other ethnic groups are necessary for effective prevention and management of hypertension.

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Original Article

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Epidemiological Study of Malaria among the Oraon Tribe of Jashpur District

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Abstract

Oraon is a predominant tribe of Northern part of Chhattisgarh state. Chhattisgarh accounts for 2% of the total population of the country but it contributes more than 16% of the total malaria cases. For the present investigation two development blocks were selected from Jashpur district in order to report the precise knowledge of local epidemiological features of malaria among the Oraons.Outs of 243 households selected for the purpose 10.7% were affected with Malaria. Females of reproductive age showed a higher occurrence of malaria in 20-44 years age group as compared to males. Correlation of malaria with type of house, animal domestication, excreta disposal, drainage system showed non significant results. Only toilet facility showed significant results .

Keywords: Epidemiology; Malaria; Oraon; Jashpur; Chhattisgarh.

Introduction

Dynamics of malaria is a local phenomenon and vary from place to place (pattanayak et al.1994). Chhattisgarh state accounts for 2% of the total population of the country but contributes >16% of the total malaria cases, 23% of plasmodium *falciparum* cases and 7% of deaths due to malaria in the country (Singh et al. 2004).

Chhattisgarh was earlier a part of the state of Madhya Pradesh which was recognized as a separate state in 2000. The total population of the state according to 2011 census is 25,540,196 and covers an area of 135,194 square km. Northern part of Chhattisgarh is a tribal belt and is recognized for its ethnic variation and has huge natural resources, which is known as Jashpur- Surguja region. Jashpur district is divided into upper ghat and lower ghat. The government has specified two tribal communities as primitive viz Pahari Korwa and Birhors. Oraons, Kanwars, Bhuijyans, Khariyas, Pandos, Nagesias, Asurs are the other tribal populations residing in Jashpur. The total population of Jashpur according to 2011 census is 8, 52,043.

For the present investigation two development blocks viz Manora and Bagicha were selected from upper ghat and two blocks viz Kunkuri Pharsabahar from lower ghat. The beliefs and customs of the local tribe in Jashpur are quite unique. Oraon tribe in India constitutes around 8.2% of the total population which mainly depends on agriculture for earning their living. They are also known as "Kurukh" which is related to Dravidian family.

Human populations live in societies, where behaviour and attitudes are shaped by interaction among people, which in turn are governed by the conventions and laws of the society. In short, epidemiology studies disease within a cultural context and population exist in a physical environment which is a dominant force in determining health. Malaria is currently the world's most widespread and serious vector borne disease. Malaria associated morbidity and the cost of treatment are important burden and create barriers for the overall social and economic development. There are large number of risk factors that influence vulnerability to malaria including proper knowledge about malaria transmission and prevention,

demography and socio-economic status of different population groups (Yadav et al. 2014). In 109 countries malaria is considered to be endemic. Over one million deaths occur each year with 300-500 million episodes of malaria illness globally. WHO estimated that there are 15 million cases in India annually and around 15,000 mortality per annum based on case fatality rates . 8 central peninsular states viz. Chhattisgarh, Jharkhand, Orissa, Madhya Pradesh, Gujarat, Maharashtra, Rajasthan and Andhra Pradesh are areas of high prevalence for malaria. Studies pertaining to knowledge, attitude and practices showed that direct interaction with the communities plays an important role in circumventing malaria problem (Klein et al, 1995). Precise knowledge of local epidemiological features of malaria will provide the basis not only for planning and choosing appropriate control measures but also for selecting methods for monitoring the progress and evaluating programmes. There is no study regarding the relationship of socio environmental and health characteristics of Oraon tribe of Jashpur district of Chhattisgarh. Therefore, an attempt has been made to investigate the impact of different epidemiological factors on frequency of malaria among the Oraon tribe of Jashpur.

Material and Methods

Purposive sampling method was adopted for selecting four blocks of Jashpur district. Random sampling method was adopted for selecting five villages from each block and from each village 20 households were selected by random sampling for primary data collection. Besides demographic data collected by means of interview schedule information on various aspects of mosquito bite, breeding place of mosquitoes, measures of prevention, traditional cultural practices related to malaria, concept of disease and environmental factors which affect malaria were also considered. Data was processed in Ms-Excel data sheet, SPSS software package was used keeping in view the specific objective of the study.

Objective

1. To know the incidence and determinants of malaria among the Oraon tribe of Jashpur district.
2. To study the factors influencing the high frequency of malaria in the district.

Result and Discussion

Data for the present investigation comprised of 243 (215 where males and 28 females). 70.87% had nuclear family type and 28.39% had joint family. The table reveals that 20.99% of the households have

Table 1: Household characteristics of the respondents of various tribes of Jashpur district, C.G.

S.N.	Characteristics	Types	Number	Percentage
1	House type	Kachcha	190	78.2
		semi-pucca	40	16.5
		Pucca	13	5.3
2	Occupation	Labour+agriculture	67	27.6
		Agriculture	137	56.4
		Service	36	14.8
		Business	3	1.2
3	Animal domestication	Far from home	24	9.9
		nearby home	219	90.1
4	Excreta disposal	far from home	81	333
		nearby home	162	66.7
5	Drainage system	No drainage	22	9.1
		Closed	12	4.9
		Open	209	86.0
6	Toilet facilities	No	187	77.0
		Yes	56	23.0
7	Location of house	plain area	7	2.9
		far from forest	73	30.0
		nearby forest	163	67.1
8	Monsoon	Unhygienic	56	23.0
		Mosquito breeding time	95	39.1
		Storing of water in bunkers	76	31.3
		Suddenly changing in weather (warm to cold)	16	6.6

Correlations

		Disease	House type	Animal domestication	Excreta disposal	Drainage system	Toilet facilities
Disease	Pearson Correlation	1					
	Sig. (2-tailed)						
	N	243					
House Type	Pearson Correlation	.023	1				
	Sig. (2-tailed)	.726					
	N	243	243				
Animal Domestication	Pearson Correlation	-.019	-.462**	1			
	Sig. (2-tailed)	.765	.000				
	N	243	243	243			
Excreta disposal	Pearson Correlation	.037	-.366**	.410**	1		
	Sig. (2-tailed)	.565	.000	.000			
	N	243	243	243	243		
Drainage system	Pearson Correlation	.022	.077	.057	-.044	1	
	Sig. (2-tailed)	.732	.230	.377	.493		
	N	243	243	243	243	243	
Toilet facilities	Pearson Correlation	.127*	.492**	-.376**	-.277**	.096	1
	Sig. (2-tailed)	.048	.000	.000	.000	.134	
	N	243	243	243	243	243	243

*. Correlation is significant at the 0.05 level (2-tailed)
**. Correlation is significant at the 0.01 level (2-tailed)

less than 4 members and 54.74% of them had more than 5 members. Majority of the respondents had kachcha type of house (78.2%) and 70.78% had walls made of mud. 72.43% had facility of light but only 10.70% of the population had proper ventilation. About 56.4% of the populations were engaged in agriculture.

The study revealed that the location of 67.01% of the population were near forest and 77.0% had no toilet facility. They disposed the excreta inside their house premises. Majority (86%) of the respondents had opened drainage system and 90.12% had dwelling place attached to shelter for domestic animals.

Out of 243 households of Oraon tribe 26 (10.70%) were affected with malaria. Females showed a higher percentage of malaria as compared to males. The table shows that higher frequency of malaria was observed in 35-39 years age group and females in all the reproductive age groups from 20-44 years showed a higher occurrence of malaria as compared to males.

Correlation matrix relationship of malaria disease with variables such as type of house, animal domestication, excreta disposal, drainage system and toilet facilities showed significant results only with toilet facility at 0.01 level of significance.

The highest percentage of the respondents adopted the method of burnt cow dung cakes and neem leaves. Next in preponderance was rice husk and burnt neem leaves (10.5%). 8.25% of the respondents used rice husk and burnt cow dung cakes. Majority of the respondents used leaves of neem. Sindhuvar leaves, rice husk, cow dung cakes, kerosene, mosquito coil and few mosquito repellents are also used for mosquito control. The percentage of people using mosquito coils, repellents and nets was quite low compared to the indigenous methods of control of mosquitoes due to the distance of shops from where they can purchase the repellents. Sindhuvar leaves are also chewed as a remedial measure of malaria.

In case of fever the populations under study do not seek the advice of doctors but they generally prefer to take home remedies either through self medication or some local healers. They get their blood examined for malaria in case of persistent fever after undergoing local treatments. The study reveals that the tribals of Jashpur believe that malaria is caused primarily by wrath and displeasure of the deity therefore, diagnosis and treatment of malaria is primarily carried out at home according to ethno medicinal perceptions in the tribal groups studied.

Recommendation

It is recommended that campaigning programme for mosquito control should be intensified before the rainy season in the area under study. Street play, video/audio advertisements in local language should be organized. Every women should be examined with due care for malaria in case of any of kind of fever to cope with the challenges of management of malaria at primary level.

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Original Article

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Variability of PTC and Colour-Blindness among Population Groups of Western India

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Abstract

Phenylthiocarbamideor PTC (or Phenylthiourea) is a chemical compound which has the ability to categorize people into two classes, tasters and non-tasters irrespective of age, sex and race (Fox, 1932). Blakeslee and Salmon (1935) concluded that the taste sensitivity (to PTC) is controlled by a single pair of autosomal gene 'T' and 't' with tasting 'T' gene being dominant over non-tasting 't' gene. Inability to clearly identify different colours of the spectrum is widely known as colour blindness. The difficulties can be mild to severe. Colour blindness exhibits a sex-linked inheritance.

A study of taste sensitivity to PTC and incidence of colorblindness was conducted among two population groups- Rajputs and Bhils- of Sirohi district, Rajasthan. A total of 230 individuals were studied among which Bhils constituted 128 individuals (59 males and 69 females) and Rajputs constituted 102 individuals (60 males and 42 females). The method of serial dilution as given by Harris and Kalmus (1949) was used for testing taste perception. Colour- blindness was examined with the help of Ishihara (1960) plates numbered 1 to 25 in a room with sufficient daylight. The frequency of non-taster't' gene was found to be higher in Rajputs (0.524) than in Bhils (0.405). The frequency of color blindness is low in the Bhil population(1.56%) in comparison to the Rajput population (1.96%). The results have been compared with the populations of North and West India. The incidence of colorblindness has also been studied in the respect to selection-relaxation hypothesis.

Keywords: Colorblindness; Phenylthiocarbamide; Polymorphic Systems; Population Groups and Variability.

Introduction

Taste perception to Phenylthiocarbamide(PTC) and incidence of colorblindness are two polymorphic systems which help to study genetic variability among human population groups.

Phenylthiocarbamide or PTC (or Phenylthiourea) is a chemical compound which tastes either very bitter or is virtually tasteless, depending on the presence of the gene. Blakeslee and Salmon (1935) concluded that the taste sensitivity to PTC is controlled by a single pair of autosomal gene 'T' and 't' with tasting 'T' gene being dominant over non-tasting 't' gene. The people who can taste it have dominant genetic trait and are called 'tasters' and those who cannot taste PTC are designated as 'non-tasters'. Das (1956) suggested that the dominance of taster 'T' gene is incomplete with the failure of its penetrance in the heterozygous to certain extent. Falconer (1947) observed that the female can detect the bitter taste of PTC at lower concentration as compared to the male. Seth (1962) found that smoking has significant effect on the taste threshold distribution. Taste perception phenomenon presents an excellent opportunity to population geneticists and anthropologists to study human variability.

Inability to clearly identify different colours of the spectrum is widely known as colour blindness. Colour blindness exhibits a sex-linked inheritance.

The most commonly found red-green color blindness is an X- linked defect. The inheritance of this defect shows a"criss-cross" pattern of inheritance.Colour vision is controlled by X – linked recessive genes and there seem certainly to be two (Siniscalco, Filippi and Latte, 1964) and possibly many more (Pickford, 1962) loci concerned.

Post (1962) formulated selection-relaxation theory. This theory has based on the fact that the frequency of color blindness is low among primitive hunting and gathering societies as compared to the more advanced or civilized, societies. Post believed that the civilized population had a settled lifestyle. So there is relaxation of natural selection against color blindness in civilized population. Hunter and gatherer depended heavily on their vision to obtain food and hence they are subjected to selection. Duta (1966) and Kapoor et al. (1983) utilized Post's hypothesis to study various Indian ethnic groups.

The present paper reports on PTC tasting ability and incidence of red-green colour blindness among the two population groups- the Rajputs and the Bhils of Mount Abu, Rajasthan and compares the result with various populations of North and West India.

Methods

To study the taste sensitivity and color blindness for the present report the data collection was done in District Sirohi, Mount Abu. This study was conducted among the Rajputs and the Bhils. A total of 230 individuals were studied among which Bhils constituted 128 individuals (59 males and 69 females) and Rajputs constituted 102 individuals (60 males and 42 females). The data was collected from various villages and schools.

The method of serial dilution as given by Harris and Kalmus (1949) was used for testing taste perception. Colour- blindness was examined with the help of Ishihara (1960) plates numbered 1 to 25 in a room with sufficient day light.

Statistical Tools

Gene Frequency Calculation

Non – tasters have homozygous genotype 'tt' while Tasters are either heterozygous 'Tt' or homozygous 'TT'. Thus frequency of non – taster 't' gene is computed as:

$$t = \sqrt{percentile\ frequency\ of\ non-tasters} = \sqrt{tt}$$

Percentile frequency = frequency percentage of non – taster ÷ 100

We know that in a population,

$(T+t)^2=1$

TT+ 2Tt + tt = 1

T + t =1

So, $T = 1 - t$

The frequency of heterozygous tasters can be calculated by substituting the values of 'T' and 't' in the expression 2Tt.

Mean

M = Mean threshold value $=\Sigma fx/N$

Where,

f= frequency of the given distribution

x=individual value in the given distribution

N=sample size

Σ= Indicates summation of all observations

Standard Deviation(S.D.)

It is defined as the square root of the mean squared deviation. Subtraction of the individual value from mean provides deviation. The summation of product of frequency (f) and square of deviations (d^2) is divided by sample size (N). The square root of the result provides standard deviation. It represented as:

S.D. = $\sqrt{\Sigma fd^2 \div N}$

Standard Error of Mean ($S.E._m$)

Standard error of mean is the ratio of standard deviation of the sample divided by the square root of the total number of observations.

$(S.E._m) = S.D. \div \sqrt{N}$

Standard Error of Standard Deviation (S.E.σ)

$S.E.\sigma = S.D. \div \sqrt{2N}$

Chi – Square (χ^1)Test

The general formula applied is:

$\chi^2=\Sigma (O-E^2) \div E$

Where,

O= observed frequency in a class

E= expected frequency in a class

In contingency table data is cross-classified in a manner that there are certain levels. In 2x2contingency table there are two rows and two columns.

Presentation of Data in 2x2 contingency Table: *Observed Values*

Population	Tasters	Non – tasters	Total
Population A	a	b	a + b
Population B	c	d	c + d
Total	a + c	b + d	a + b + c + d

The degree of freedom (d.f.) is calculated as

df = (no. of rows – 1)×(no. of columns – 1)

Here, both rows and columns are 2,

So, df= (2-1) x (2-1) =1

Calculation of Expected Values

Population	Tasters	Non - Tasters
Population A	((a+c)x(a+b))/T	((b+d)x(a+b))/T
Population B	((a+c)x(c+d))/T	((b+d)x(c+d))/T

The probability for chi square value at degree of freedom 1 is read from chi – square distribution table and level of significance (α) is regarded as 0.05.

Percentage of Misclassification

In the present report, two categories like taster and non – taster are reduced to single scale of threshold values. This aids in finding individual value misclassified at a given point of time.

The quantitative effect of gene can be generated by comparing the difference between the two mean threshold values, where $D= M_1-M_2$ in the two groups being genetically different. Mean standard deviation is calculated as: $\bar{S}= (S_1+S_2)\div 2$

Penrose (1951-52) suggested that the proportion of each group misclassified is equal to the one tail area under the normal distribution curve when $X= D/2\bar{S}$. The value of D/S index is dependent upon the accuracy of measurement. It involves an accurate determination of the taste threshold solution number and the position of anti-mode in the distribution.

D/S index has a useful application in field of human genetics study where it amounts to more than 3. When the value of index declines below 2, the effect is not large enough to indicate bimodality in the distribution (Harris and Smith, 1949).

The percentage of misclassification has been calculated from the Normal Probability Integral Table (Fisher and Yates, 1968). The 'Z' values irrespective of the sign were read from the table, multiplied by 2 and expressed as percent.

'C' is computed as:

$C= (M_1S_2+M_2S_1)\div(S_1+S_2)$

And 'Z' is calculated as:

$Z = (C–M_1)\div S_1$

Results

PTC Taste Sensitivity

The taste sensitivity to PTC was studied among Rajputs and Bhils. Among Bhil population studied, majority of individuals (modal value) perceived taste at threshold solution number 9. Anti- modal value lied at solution number 5. In total 102 Rajputs tested, majority of individuals perceived taste at threshold solution number 9. Therefore, mode value lied at solution number 9. The anti-mode value lied at threshold solution number 3.

Table I shows percentage and gene frequency of tasters and non-tasters among two population groups. In total Bhil population studied, tasters constituted a greater percentage i.e. 83.59% than non-tasters. The frequency of taster 'T' gene (0.595) was higher than the frequency of non – taster 't' gene (0.405). Among Rajputs tested, 72.55% were tasters and 27.45% were non-tasters. The 't' gene (0.524) had higher frequency than 'T'gene (0.476).

Table IIshows mean S.D. and D/S value for two population groups. Mean threshold value for tasters and non – tasters among total Bhil population was 9.762±0.209 and 1.259±0.260 respectively. The mean threshold values for taster and non – taster among total Rajput population were 8.554±0.229 and 0.857±0.173 respectively. The D/S Index of Penrose indicates bimodality of distribution. The values of D/S index for Bhil and Raj put population were 4.934 and 5.341 respectively. This clearly indicated that distribution of tasters and non – tasters among two population groups was statistically bimodal.

On comparing two populations it was found that the frequency of non-taster 't'gene was higher in Rajputs (0.524) than in Bhils (0.405). Bhil population exhibited a significantly higher mean threshold value for tasters (9.762±0.209) in comparison to Rajput population (8.554±0.229). To check arbitrary allocation of subjects to taster and non-taster classes, percentage of misclassification has been calculated (mentioned in Table 3). The values were 0.76 and 1.38 for Rajputs and Bhils respectively.

Incidence of Colour-Blindness

Table 4 shows incidence of color blindness among Rajput and Bhil population groups.

The incidence of color-blindness among the Bhil males is 3.39% whereas it is 3.33% among Rajput males. No female subject was found to be color-blind due to X – linked nature of the trait.

Table 1: Table showing percentage and gene frequency of tasters and non-tasters among two population groups

S.no.	Population	Sample	Taster	Non-taster	Percentage Taster	Gene frequency Non-taster	Taster	Non-taster
1	**Rajputs**	102	74	28	72.55	27.45	0.476	0.524
2	**Bhils**	128	107	21	83.59	16.41	0.595	0.405

Table 2: Table showing mean, S.D. and D/S value

S.No.	Population	Mean±Se		Sd±Se		D	S	D/S
		Taster	Non-Taster	Taster	Non-Taster			
1	**Rajputs**	8.554±0.229	0.857±0.173	1.967±0.162	0.915±0.122	7.697	1.441	5.341
2	**Bhils**	9.762±0.209	1.259±0.260	2.097±0.148	1.350±0.184	8.503	1.724	4.934

Table 3: Table showing percentage of misclassification

S.No.	Population	C-value	Z-value	Percentage of Misclassification
1	Rajputs	3.3	-2.67	0.76
2	Bhils	4.59	-2.47	1.38

Table 4: Table showing incidence of color blindness

S. no.	Population	Total no. of individual tested	Colour blind	Type		Percentage (%)
				Protan	Deutan	
1	Rajputs	102	2	2		1.96
2	Bhils	128	2	1	1	1.56

Discussion

On comparing two populations it was found that the frequency of non-taster 't' gene was higher in Rajputs (0.524) than in Bhils (0.405). Bhil population exhibited a significantly higher mean threshold value for tasters (9.762±0.209) in comparison to Rajput population (8.554±0.229). In the present study the values of D/S Index for Bhils and Rajputs were 4.934 and 5.341 respectively. This clearly indicated bimodality in the distribution of tasters and non – taster in the two populations.

The t-allele frequency of Bhil population (0.672) of Gujarat (Vyas et al., 1962) and Bhil population (0.562) of Bombay (Mukerjee et al., 1977) was higher in comparison to presently studied Bhil population (0.405) in Sirohi district. The presently studied Rajput population showed close resemblance to the Kolis of Panchamahal district, Gujarat in terms of t-allele (0.527)(Kshatriya and Bhasin,1979) frequency. The t-gene frequency of Rajputs in the present report show close resemblance to Marathas (0.531) of Maharashtra (Mukherjee et al., 1977) and Ved Nagar Brahmins (0.516) of Bombay (Sanghavi and Khankolkar, 1949).

The chi-square test has been devised to compare Bhil and Rajput population of Sirohi District with various populations of West India to see whether statistical differences exist among them for the frequency of 't' gene in the populations. It had been found that Bhil population of Sirohi District under study show significant difference with Rajput population of Sirohi district in the present study (4.130, df=1 and 0.05>p>0.025).

The Bhil population in the present study showed significant difference with Bhils of Panchamarhi, Bhils of Bombay, Minas of Udaipur, Muslims of Narender Nagar, Rajputs of Kumaon and Kolis of Surat. Rajput population of Sirohi district (in present study) show significant difference with Rajputs of Uttar Pradesh, Rajputs of Lucknow, Bhils of Panchamarhi, Dublas of Surat, Gujars of Udaipur, Minas of Udaipur and Gujars of Delhi.

It has been found that the frequency of color blindness is quite variable in India. The frequency of color blindness ranges from 0.00 among Raigars of Rajasthan (Ghosh, 1970-71) and Angami Nagas of Nagaland (Seth & Seth, 1973) to a high frequency (0.104) among Apatanis of Arunachal Pradesh (Jaiswal,1975). In general, the frequency of color blind males in Indian populations is 0.036.

The frequency of color blindness was low in the Bhil population (1.56%) in comparison to the Rajput population (1.96%) which might be due their ethnicity and occupations. Bhils primarily rely upon agriculture or forest – based economy and they frequently visit to nearby forest area to collect fuel wood and color blindness could act as a disadvantage

to their livelihood. Selection pressure increases and tends to remove color blind individuals, resulting in a low value of red – green color blindness among them. This study provided support to Post's hypothesis of relaxation of selection as the main idea of the hypothesis revolved around the fact that there is greater incidence of color blindness among higher caste groups such as Brahmins and Rajputs as they are further removed from primitive lifestyle in comparison to lower occupation groups.

Conclusion

When the two (the Rajput and the Bhil) populations were compared, it was found that the frequency of non-taster 't' gene was higher in Rajputs (0.524) than in Bhils(0.405). Bhil population exhibited a significantly higher mean threshold value for tasters (9.762±0.209) in comparison to Rajput population (8.554±0.229). It had been found that Bhil population of Sirohi District under study show significant difference with Rajput population of Sirohi district in the present study (4.130,df=1 and 0.05>p>0.025).

Taste perception to PTC and incidence of colour-blindness interlinks and provides an insight into various fields such as genetics, ecology, evolution and nutrition. These traits also help us to understand the origins of genetic variation in humans.

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Original Article

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Conservation, Displacement and Tribal Right: An Anthropological Study on Tribal Issues in Achanakmar Tiger Reserve

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Abstract

The adivasi right on forest was not recognized during colonial period neither was it ensured after India got freedom. The conflict between the state and communities over the use of forest resources was started with the passing of Indian Forest Act, 1865. The passing of the Scheduled Tribes (Recognition of Forest Right) Bill as Forest Right Act was considered as victory of indigenous people. Under the Forest Act, 2006 the forest dwelling scheduled tribes receive ownership rights over land and forest. But the conservationists, wild life activist and forest department remained opposed to the provision of Forest Right Act in the National Parks and Sanctuaries. In 2008 the Forest Right Act enacted with a provision to create wild life habitat for conservation of wild life and denying the right of forest dwelling tribal communities within critical wild life habitat. As per provision of the Act, under section 4 sub-section 2 of chapter-iii, the forest department has begun widespread evictions across the country. Now the question arises what extent Recognition of Forest Right Act is useful to enjoy their right over forest. Therefore the paper aims to examine the conflict between the right of the tribal people and conservation of forest resources in relation to Forest Policy and Recognition of Forest Right Act.

Keywords: Conservation; Displacement; Tribal Right.

Introduction

India has 668 Protected Areas, out of which there are 102 National Parks, 515 Wild life Sanctuaries, 47 Conservation Reserves and 4 Community Reserve. It extends over 1,61,221.57 sq.km covering 4.90 percent of total geographical area. The Sanctuary/National Park is declared for the purpose of protecting and developing wild life or its environment. The difference between them lies in the vesting of right of people living inside. Certain right of people living inside the sanctuary could be permitted, where as in national park no rights are allowed. The conservation reserves are the areas adjacent to national parks and sanctuaries and those areas which link one protected area with another. The right inside the conservation reserves is not affected. An ongoing centrally scheme known as Project Tiger sponsored by Ministry of Environment and Forest was launched in 1973 with a view to promote conservation of tiger. It includes support for implementing the provisions of the Wild life Protection Act, 1972. Starting from 09 tiger reserves in 1973-74, the number has grown up to forty seven as on Sep, 2014. The tiger reserve is governed by project tiger, which is of special significance in the conservation of tiger. A total area of 68676.47 sq.km. is covered by the 47 tiger reserves, of which 38770.30 sq.km is core area/critical wild life habitat.

Origin of Research Problem

The forest is managed by the forest dwelling tribal community not only for their livelihood, but also for their socio-cultural life. They are residing on their

ancestral lands for generation. There exists a close relationship between forest dwelling scheduled tribes and forest ecosystem. They are inseparable from this ecosystem and can not survive in isolation. But their dependence on forest was always overlooked. There was always a conflict in between on the needs of the local *adivasi* and preservation of forest. The passing of the Forest Act (Recognition of Forest Rights) in 2006 was considered as a victory of indigenous people. On the other hand the forest officials remained opposed to the Act across the country. They have given stress to keep the provisions of the Act outside the national parks and sanctuaries fearing that the law would damage forest and wildlife. The concept of critical wild life habitat was then introduced in Recognition of Forest Right Act with a view to enhance the Wild life Protection Act and reduce local community interference on forest.

Inter Disciplinary Relevance

A conference on "Displacement, Forced Settlement and Conservation" was held on 9th-11th September, 1999 at Oxford. The conference addressed "In the case of India, it was argued that the scale of tribal cultures and natural resources must not be forgotten. The complexity of relationship of indigenous population with development must be kept in mind." Evidences of displacement from parks and sanctuary shows that "This does not work for the benefit of the local population nor the environment. People should be part of biodiversity; hence conservationists and social scientists should have shared aims". The above mentioned problem therefore need to examine from multidisciplinary platform which was bring together the view of social scientists, conservationists, wild life and social activists to understand the issues relating to the conservation and right of tribal people and also their relationship with forest. Achanakmar Wild life Sanctuary in Chhattisgarh notified as Achanakmar Tiger Reserve in 2009 was selected for the study with a view to examine the conflict between right of tribal people and conservation of forest resources in relation to Forest Policy and Recognition of Forest Right Act.

Forest Governance and Tribal Right

Forest is governed by two main laws, The Indian Forest Act, 1927 and The Wild Life Protection Act, 1972. Declaration of reserve and protected forest under Indian Forest Act, 1927 means no right either existed there or would exist in future. It was observed that there is no specific provision in Indian Forest Act, 1927 for the protection of tribal right over forest. The Wild life Protection Act, 1972 empowers to constitute a protected area as a national park/ wild life sanctuary. It prohibits the resource exploitation including subsistence use by local communities in a wild life sanctuary. As a result tribal living in sanctuary has lost forest as a source of their livelihood. The restriction on the entry of the local people in wild life sanctuary through this Act leads in raising man-animal conflict. With the commencement of Wildlife Protection Act, 1972 and Forest Conservation Act, 1980, it was observed that there was no role of forest dwelling tribal community in the protection and management of local forest. With the coming up of Forest Conservation Act, a good number of tribal people became illegal residents on land over which they have been living for generation. A large area was also declared as forests without settling their right. People residing in and around the forest were termed as encroachers in their own land. That was a phase of conservation with increased state control. Thereafter the symbiotic relationship of the tribal with forest was stressed in the National Forest Policy of 1988. It aimed to involve tribal people in forest conservation and management. It also recognized the customary right of the tribal people on forest land. In 1990 a circular was issued by the Ministry of Environment and Forest in order to implement the provisions mentioned in National Forest Policy, 1988. But the Ministry failed to implement the1990 guideline.

In 2002, a eviction notice was issued to forest dwelling tribal communities as they failed to produce residential evidence in forest as per Forest Conservation Act, 1980. A direction for their immediate eviction from the reserve forest instead of recognizing their right was issued. Large relocation from the core areas of National Parks and Sanctuaries increased the loss of livelihood of forest dwelling schedule tribe. Following the protest by tribal communities along with social activists against large scale evictions by forest department, Ministry of Environment and Forest issued a guideline in 2004 to address the issue of recognizing the right of tribal communities to forest land and resources. In 2005 the draft of Recognition of Forest Rights Bill was made to give due recognition the *adivasi* rights to forest resources and prevent the alienation of tribes from their own habitat. In addition the community is given the right to protect forest. But the main challenge of the Recognition of Forest Right Bill, 2005 was to solve the conflicting interest of recognizing forest right of forest dwelling schedule tribe while protecting forest and wild life resources. It also showed a lack of clarity in relation of provisions mentioned in Wild life Protection Act,

1972; Forest Act, 1927 and Forest Conservation Act, 1980. The tribal right bill was therefore opposed by the conservationist and wild life activists. In their view, the Tribal Right Bill may cause the elimination of large forest land and heavy ecological damage. The Ministry of Environment and Forest suggested that people right in the national park and sanctuary may be given after the declaration of protected areas (national park and sanctuary) as critical wild life habitat. Under much civil protest and pressure, the Scheduled Tribes and other Traditional Forest Dweller Act was enacted in 2006 and came into force in 2008. As per provision of the Forest Right Act "the forest rights recognized under the Act in Critical Wild life habitats of national parks and sanctuaries may subsequently be modified and provided that no forest right holders shall be resettled or have their rights in any manner affected for the purpose of creating inviolate areas for Wild life conservation". Because of which the existence of forest dwelling tribal communities in protected areas is coming under threat.

Development of Achanakmar Wild Life Sanctuary as A Tiger Reserve (Area under study)

Achanakmar Wild Life Sanctuary was established in 1975 under the Wild Life Protection Act of 1972. Wild Life Protection Act, 1972 laid the legal framework for the establishment of National Parks and Wild Life Sanctuaries and management of wild life habitat. The entire area of Achanakmar Wild Life Sanctuary was 551.55 square kilometers. It forms the core zone of Achanakmar- Amarkantak Biosphare Reserve notified on 30 May,2005. The major part of Biosphere Reserve lies in Bilaspur district of Chhattisgarh and remaining part extends into Dindori and Shahdol district of Madhya Pradesh. The total area of Biosphere Reserve is 3,835.51 sq.km. Out of total area, an area of 1,224.98 sq. km. falls in Madhya Pradesh and the remaining area of 2,610.53 sq. km. falls in Chhattisgarh state. The core area (551.55 sq.km.) of Biosphere Reserve will be kept free from all human pressure. The remaining area of 3,283.96 sq.km. surrounding the core zone form the buffer zone. The manipulation activities may be permitted in the buffer zone according to general guideline for the management of biosphere reserve. The constitution of Biosphere reserve under its legal status do not change the status of legal ownership of lands and forest nor affect the right of the tribal and local people in any way.

The Achanakmar Tiger Reserve falls within the core zone of the Biosphere Reserve. In 2003, the 37th meeting of the steering committee of project tiger recommended that Achanakmar Wild Life Sanctuary spreading over an area of 551.552 sq.km. be declared as critical tiger habitat. Achanakmar Wild life Sanctuary is one of the vital links in the Central India tiger heart land more particularly with Kanha. The Kanha-Achanakmar Corridor links the Kanha tiger reserve in Madhya Pradesh to the Achanakmar tiger reserve in Chhattisgarh. As on Sep, 2014 Achanakmar tiger reserve extends over an area of 914.017 sq.km., out of which 626.195 sq.km. was declared as core area/critical wild life habitat and 287.22 as buffer zone. It has numerous species of wild animals like Chital, Wild Bear, Leopard, Tiger Panthera, Striped Hyaena, Canisaureus Jackal. The birds which inhabit the sanctuary/reserve are peacock, parrot, myna, kingfisher and eagle. The forest has been categorized as Northern Tropical Moist Deciduous forest with trees like sal,saja,dhavda,tinsa,haldu,tendu,jamun,bel,karra and bamboo. The area has SAL (*shorea robusta*) as dominant species.

A. Conservation and Displacement

(i) Affected Village and Community

Achanakmar tiger reserve initially extended over an area of 551.552 sq.km. and subsequently got expanded over an area of 914.017 sq.km. The inhabitants are mainly Baiga. Baiga is a particularly vulnerable tribal group of Chhattisgarh as well as Madhya Pradesh because of their isolated living, dependency on forest economy, low literacy and high mortality rate. The other inhabitants residing in Achanakmar Tiger Reserve are Gond, Bhaina, Sauta ,Dhanwar, Ahir, Panika and Kewat. It was decided that the villages located in the core area of Achanakmar wild life sanctuary renamed as Achanakmar tiger reserve, would be relocated on priority basis. At that time it was found that there were 22 villages inside the core area. It was decided in 2006 to relocate the *Jalda* village consisting of 53 families, *Bankal* of 26 families, *Samardhasan* of 12 families, *Bahue*l of 31 families, *Bokara Kachhar* of 23 families and *kuba* of 22 families from the critical wild life habitat of the reserve, where as the provision to create critical wild life habitat under Forest Right Act was enacted in 2008. The decision regarding relocation before declaring and demarcating critical wild life habitat is the violation of Forest Right Act.

Achnakmar tiger reserve was declared in 2009. It consists of 30 villages out of which 25 villages are in core area and 5 villages in buffer area. There are 25 villages with a total population of 8339 living

within the core area of Achanakmar Tiger Reserve. The villages were having high concentration of tribal's (83.67 percent). A total of 1774 house reside in twenty five villages. It was decided that twenty five villages located in the core area of the tiger reserve would be relocated in different phases. The first phase of displacement of six villages (*Kuba*, *Samardasan*, *Bankal*, *Jalda*, *Bahaud* and *Bokara Kachhar*) was made in Dec, 2009. A total of 1611.984 hectares area would be acquired from 25 villages, out of which 196.779 hectares of land was already acquired from six villages during phase-1. 167 families from six villages *namely Kuba, Samardhasan, Bankal, Jalda, Bahuel and Bokara Kachhar* have been relocated in 2009. Out of 167 families relocated due to establishment of tiger reserve, 158 families (94.61percent) were tribals, more particularly Baiga (70.34 percent), a PVTG of Chhattisgarh as well as Madhya Pradesh, whereas sec.3(1e) of the Recognition of Forest Right Act recognized the habitation right of PVTG.

(ii) Rehabilitation Policy

As per provision of the Recognition of Forest Right Act, forest dwelling scheduled tribe would be relocated from critical wild life habitat with due compensation. According to the guideline of the ongoing centrally sponsored scheme of project tiger in 2008, the rehabilitation package for village relocation and rehabilitation with two options was proposed. The affected villages had opted option-2 as a rehabilitation package. If the family opts option-2, the forest department actively involves in the process of relocation from the tiger reserve. Option-1 provides payment of entire package amount (Rs. ten lakhs) to the family without involving the forest department in rehabilitation process. In case of option-2, the entire rehabilitation package amount Rs. 10 lakhs per family will be distributed as follows:

S. No.	The details of the rehabilitation package	Percentage to the total package of Rs. 10 lakhs
1	Agriculture land procurement (2 hectare) and development	35 percentage of the total package
2	Settlement of rights	30 percentage of the total package
3	Homestead land and house construction	20 percentage of the total package
4	Incentive	5 percentage of the total package
5	Community facility (access road, irrigation, drinking water, sanitation, electricity, tele communication, community centre, religious places, burial/ cremation ground)	10 percentage of the total package

Revised guideline of the ongoing centrally sponsored scheme of project tiger in 2008 states that in the case of option 2, the relocation process would be monitored/implemented by the two committee namely state level monitoring committee under the chairmanship of chief secretary of the state and district level implementing committee under the chairmanship of district collector. Secretaries of related department, state principal chief conservator of forest, non-official members of respective tiger conservation foundation and chief wild life warden will be the member of state level monitoring committee. The members of district level implementing committee are CEO, representative official from PWD, social welfare, tribal, health, agriculture and education department and deputy director of tiger reserve/protected area.

(iii) Rehabilitation and Livelihood Issues in Resettlement Village

Three villages namely *Bankal, Bokra Kachhar and Smardhasan* relocating from the core area/critical wild life habitat were rehabilitated in one resettlement colony. The design and structure of the rehabilitation village looks like a colony than a village. The construction and design of the house is not like their original habitat. The house of the resettlement village is too hot in the summer season as it is made of cement. As a result they never like to sleep in. A total of 66 eligible right holders were rehabilitated *in Bahuel*, 41 eligible right holders in *Bokra Kachhar*, 30 eligible right holders in *Bankal,* 16 eligible right holders in *Smardhasan* and 22 eligible right holders in *kuba* rehabilitated village. A total of 175 eligible right holders resettled in five villages. The rehabilitated villages are high concentration of tribal (93.71 percent), more particularly Baiga (89.14 percent). At the time of relocation, Rs. 5000 as living expenses was given to the eligible right holder and forty five thousand deposited to their bank account. As per option-11, agricultural land was given. At the time of relocation, it was verbally assured that leveling of allotted agricultural land would be done. But it was not completed. Promises of living accommodation, school, health centre, roads, drinking water and livelihood sources were not fulfilled. It was found that the sources of drinking water were not in working order and availability of drinking water was not enough to sustain their livelihood in the resettlement colony. It was observed that lack of co-ordination in between social welfare, education, health and PWD department exists in the resettlement colony. No *aganwadi* has not yet been constructed in the rehabilitation site. They are not

permitted to go into the forest to collect either minor forest produce or fire woods. Due to setting up of tiger reserve they have lost their traditional livelihood which is collecting forest produce. On the other there are no livelihood options at the rehabilitation site. The only option has to go outside the area and work as wage labour.

They have not only lost their source of income, they are spending more money than before as their basic needs are being fulfilled by the market. They found themselves neck deep in debt as they were alien from their forest based economy. They find themselves more impoverished. It is the violation of Chhattisgarh State Forest Policy, 2001. Under the heading Bio-Cultural diversity Conservation (para 4.9) of Chhattisgarh State Forest policy, 2001 states that displaced tribal people "*rehabilitated on such sites and in such manner that their standard of living after rehabilitation is markedly improved.*"

(iv) Forest and Environmental Policy

National Environment Policy, 2004 issued by the Ministry of Environment and Forest had declared to give legal recognition of the traditional right of forest dwelling tribes. Under the heading "Forest and Wild life" it has recognized that "forest is the traditional homes of forest dwelling tribes". Under the heading of Rights and Concessions of Chhattisgarh State Forest Policy, 2001, Para No. 4.3.3 states that the socio-economic and cultural life of tribal's and other communities living within and near forest revolves around the forest. It also states that the rights and concessions enjoyed by them should be protected, with due regard to the demands of the conservation of biological diversity in the area. Para No 4.9 describes that "Tribals and rural people displaced if any, due to creation of such national parks/biosphere reserve/ or gene conservation should be fully and properly rehabilitated on such sites and in such manner that their standard of living after rehabilitation is markedly improved". It also describes that "Tribals and other indigenous people of the state, residing in and around forest areas, with rich cultural traditions and practices, should be encouraged to maintain their unique relationship with the forest for mutual benefits".

B. Tribal Right

(i) Tribal Right Over Forest

On 13 December, 2005 Ministry for Tribal Affairs introduced the Scheduled Tribes (Recognition of Forest Right) Bill, 2005 into parliament to recognize the forest rights and occupation in forest land who have been residing in such forests for generations. The Recognition of Forest Right Act was then passed in 2006. It empowers the communities by recognizing their right to use, manage and conserve forest resources. The cut off date for holding ownership right to forest dwelling schedule tribe under the Recognition of Forest Right Act has been extended from 25 October, 1980 (As per Forest Conservation Act, 1980) to 13 Dec, 2005. It attempts to ensure livelihood and food security by recognizing community right over forest resource. The Forest Act, 2006 under the heading forest rights, section 3 (I) of chapter II states 12 specific rights, including the right to live in forest, to self cultivate, right to own, collect, use and dispose of minor forest produce and right to grazing inside the forest which are traditional and customary.

On the other a debate on "whether forest/wildlife or tribals" was raised due to the passing of the Act. Conservationist groups believe in that the Act is against the wild life interest as they allowed people to gain right inside the national parks and sanctuaries. There was a fear to wipe out the forest/ wild life in the country. The Conservationist and Wild life Activist tried to keep the provisions of the Act outside the National Parks and Sanctuaries fearing that law would damage forest and wild life. Shankar Gopala Krishnan, spokes person for survival and dignity, pointed out that "The Forest Act is not a land distribution measure that will wipeout forests." "Activists who are fighting for tribal and forest dwellers rights point out that the best forest in India exist where tribals and forest dwellers have control over land and where they reside. According to the forest survey of India, 2003, 60 percent of the forest exists where tribal live. It shows that they have managed to conserve the forest better than others, said campaign for Survival and Dignity spokes person Shankar Gopala Krishan" (Gaur, 2008).

Under section 4 subsection 2 of chapter III, the Forest Right Act states, "The forest rights recognized under this Act in critical wild life habitats of national parks and sanctuaries may subsequently be modified or resettled, provided that no forest right holders shall be resettled or have their right in any manner affected for the purpose of creating inviolate areas for wild life conservation." As per provision of the Act, the state forest department has begun widespread eviction across the country in the name of conservation of wildlife. Achanakmar tiger reserve of Bilaspur district has witnessed an effort to evict local tribal and forest dwellers after the renamed of Achanakmar Sanctuary as Achnakmar Tiger Reserve.

(ii) Tribal Right within Tiger Reserve

The tiger reserve is based on assumption that local communities living in or around wild life conservation area have a negative impact. Therefore they must be relocated outside the boundaries of the reserves and the restriction of their movement into forest will be imposed. This cause of action will protect the wild animal and plant species from human encroachment.

The forest department takes advantage of the project of tiger reserve to facilitate the rehabilitation of the affected families to areas outside the forest, by making it mandatory for the villages to relocate if the villages are inside the core area. After eviction from the reserve the forest department will be secured a monopoly over forest.

The revised guideline for the ongoing centrally sponsored scheme of the project tiger, 2008 has also addressed the inviolate spaces for wild life and relocation of villages from core area/critical tiger habitat in tiger reserve. "According to present estimates of the Ministry of Environment and Forest there are 1487 villages with a population of 3.80 lakhs in just the 28 tiger reserves of which 273 villages and 1.1 lakh people live in what the Ministry calls the 'core' area, that is the area in which according to Ministry there should be no human habitation for the needs of tiger conservation."(Gaur,2008).

The provision relating to the forest right in National Park and Sanctuary mentioned in section 4 subsection 2 of chapter III of the Recognition of Forest Right Act is a crucial issue that goes denying rights to the tribals and forest dwellers. This provision is expected in making to avoid their right within a critical wild life habitat. Human habitation including tribal settlement has therefore to be evicted from the core area/critical wild life habitat. With taking the advantage of this provision the forest department very cleverly has / is being proposed to convert National Park/Sanctuary into tiger reserve. It was found that effort was also made to evict local tribal people before issuing the notification regarding the declaration of core area of Sanctuary/National Park as critical wild life habitat. From the field study of Achanakmar tiger reserve, it was observed that before demarcating the critical wild life habitat, it was decided in 2006 to relocate the *six* villages located in the core area of the reserve.

Conclusion

As per report of the samata study team, R.K.Rao, a senior forest officer, in his paper "*Forest Myths, Jungle Laws and Social Justice*" was quoted, "If we look at the evolution of PA's concept in our country, their objective was preservation (not conservation) of wild life and PA's comprised of core area and a buffer zone, both within the PA, *then came the concept of declaring the core area as a National Park* and *buffer as a Sanctuary* under the Wild life Act in view of greater restriction that can be imposed in a National Park and buffer was shifted to outside the PA boundaries. Now the buffer zone is proposed to be declared as the conservation area under the 2003 amendment to the Wild Life Act; and most likely, the area beyond the conservation area, if any is left, will become the buffer zone" (Devullu et al.,2005). It is therefore clear that government is taking more land and natural resources from access of local communities by projecting them as main causes of degradation.

The earlier core area within the protected area is now known as critical wild life habitat. The critical wild life habitat is a legal provision as per Recognition of Forest Right Act. It was created to enhance the Wild Life Protection Act and avoid in continuation of rights of forest dwelling tribal communities over forest land. As a result most of the sanctuaries have/are being declared as critical wild life habitat and converted into tiger reserve. People living in critical wild life habitat, a new name of core area, were/are being evicted in the name of conservation of wild life. As a result the relocation has created a division between civil society group whose thought is on conservation and wild life protection and people's struggle group whose focus is on supporting human right issues. Keeping in mind both the need of conservation as well as requirement of tribal livelihood the issues on tribal right and conservation need more dialogue and integrate the view of conservationist, activist and community members.

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Religious Universe of the Deoris of Assam

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Abstract

The Deoris are one of the scheduled tribes of Assam inhabiting mostly in the Plain areas of Upper Assam. The entire Deori tribe is divided into four broad divisions or khel on the basis of their places of origin. They are – Dibangiyas, Tengapania, Borgoyan and Patorgoyan. Of all the four divisions of the Deoris, the Dibangiyas have preserved their socio religious organisations almost along with their indigenous dialect known as duan. The Dibangiyas mainly propitiate Kundi-Mama also known as Burha-Burhi or Gira-Girachi as their chief parochial deities. They have a common place of worship known as Midiku,, also called it as Deoshal or Deoghar,Kundiku , which means the abode of the supreme deity, Kundi-Mama. The Dibangiya Deoris observe various rites and rituals in connection with the principal events of life as well as for the welfare of the community as a whole and to propitiate their different pristine God and Goddesses. But at contemporary times due to the influences of other religious beliefs, specially the influence of great traditional Hinduism of neighbouring caste Hindus, some impinging factors have been percolated in their indigenous belief system. In this present endeavour an attempt has been made to know about the traditional belief system of the aforesaid ethnic group in a rural context.

Keywords: Deori; Kundi-Mama; Deoshal; Deo Utha; Dujan Labiduba; Suje; Caste Hindus.

Introduction

The term religion is generally used to denote a man's relation to supernatural powers and various organised system of beliefs and worships in which these relation have been expressed. Religion as a social force exerted influence in both preliterate and literate societies. It provides the vital force for making up the foundation of society through ages. Religion has been marked as a dominant concern of mankind because it can only be realised, conceptualised and even feel the essence. Due to the dynamic and elemental characteristics, the word religion is very hard to define in an appropriate and concise manner. It comes from the Latin word 'religare', which means 'to bind together' or from the word 'religere' which means 'to rehearse, to execute painstakingly', suggesting both group identity and ritual (Yinger,1957). Thus, literally religion is a principle of unification and harmonisation. It is a universal institution which is deeply rooted in man's social and biological world.

Anthropologist Wallace (1966) defined religion as 'a set of rituals, rationalized by myth, which mobilizes supernatural powers for the purpose of achieving or preventing, transformations of state in man and nature'. Behind this definition it is recognized that when people cannot solve serious problems through technological or organizational means that cause them anxiety, try to solve by the manipulation of supernatural powers or beings. This requires rituals, which according to Wallace is the primary phenomena of religion, or 'religion in action'. Its major function is to reduce anxiety and keep confidence high, which serve to keep people in some sort of shape to cope with reality (Haviland, 1990). Religion specially Tribal religion is a topic, on which

there have been dozens of monumental works done by various renowned anthropologists like Tylor(1871), Frazer(1911), Durkheim (1912), Srinivas (1952), Malinowski (1954),Redfield (1965), Vidyarthi (1968),Zaman(2010,2015), Medhi(2012) and others.

Objectives and Methods

The present study is mainly concerned with—(i) the beliefs and practices in relation with the supernatural ; (ii) the place of worship and the religious specialist; (iii) the pristine rites and rituals of the Deoris; (iv) the rites and rituals observe in relation with principal events of life;(v) the changing trend.

The empirical data for the present study is collected from a homogenous Deori village named Bahgora Deori Gaon of Lakhimpur District, Assam. Standard anthropological field methods like non participant observation, household survey, in depth interview and case study are employed for the collection of first hand ethnographic data. Data collected from one individual is cross checked with others for authentication of the same. Some of the secondary source materials have also been consulted to know about the community as well as about their customs in relation to the present study.

The Micro Field

Assam is a confluence of diverse ethnic community. Each ethnic community in this state has its own distinctive cultural and religious beliefs and practices which are often associated with their day to day activities like festivals, birth, initiation, marriage, death and so on. Here tribal religion basically is a community religion that involves active participation in the religious beliefs, ceremonies, rituals and festivals of the community. However in contemporary times the tribal groups of Assam have been found in transition from primitive to modern stage of social development. Some tribes here lost their culture and the original beliefs and rituals had also undergone changes due to the impact of other religion like Hinduism, Christianity, Islam, Buddhism etc. Yet there are some tribes which are found to retain their own pristine traditional customs and practices. The Deori, a plain scheduled tribe of Assam, is one such community. This paper attempts to study the indigenous belief system practiced by the Dibangiyas, a sub-group of Deori tribe inhabiting in the plains of Assam. For the present discussion a study was made on a village, Bahgora Deori Gaon of Lakhimpur District, Assam. The materials collected for the present discussions were collected during the month of December and January, 2015-2016. The study village is a homogenous one, inhabited by the Dibangiya Deoris only.

The People

The Deoris are one of the important indigenous scheduled tribe of Assam. They are one of the offshoots of Mongoloid stock and linguistically they belong to Tibeto- Burman family. Centuries ago this tribe has migrated from North East Asia i.e., from Chinese and Mongolian territories to the Brahmaputra valley and made Assam as their traditional homeland. Since then they began to settle in different parts of Assam and now they are concentrated in the upper Assam districts like Lakhimpur, Dhemaji, Jorhat , Sibsagar, Dibrugarh, Tinsukia, Sonitpur and Golaghat. Besides Assam the Deoris are also found in other areas as well. Most of the relics and remains of the tribe still exist in Arunachal Pradesh. They are mainly found in two districts of Arunachal Pradesh, i.e., Lohit and Changlang.

Multiple theories exists to explain the meaning of the term 'Deori', however one could not provide a proper definition of the word 'Deori' till date. Generally a person who has a better knowledge about God and Goddesses and can appease them are known as the 'Deoris'. According to the Deori language, 'De' means great, wise etc., and 'o' and 'ri" denotes male and female respectively. Thus the word 'Deori' means great or wise male or female being (Deori,2002:9-10). Kakati(1989:62) wrote that the word 'Deori' is originated from the Sanskrit word 'deva-grhika', meaning 'in charge of temple or a priest'.

The entire Deori tribe is divided into four divisions or khels on the basis of the places of origin. The Deoris who were believed to reside near the bank of the river Dibang are known as Dibangiya, those near Tengapani and Barpani or Bargang are known as Tengapania and Bargaya respectively. The people who inhabited in Pat Sadia were named as Patarganya. The Dibangiyas are one of the major divisions of the Deoris. Of all the four divisions of the Deoris, the Dibangiya Deoris have preserved their traditional socio religious organisation almost along with their indigenous dialect known as doan. The Dibangiyas like to call themselves as 'Jimochanyan' which is derived from three morphemes and each one carries different meaning. According to their belief 'jim' means 'Cold water', 'chan' means 'Sun' which actually personifies male and 'yan' means 'Moon' which personifies female. The Dibangiyas

believe that they were originated from the union of mother 'moon' and father 'sun'. They worship Kundi Mama also known as Burha Burhi or Gira Girachi as the supreme deity and also the creator of the complete universe. The religion of the Dibangiya Deori consists of beliefs in a multitude of benevolent and malevolent spirits. The Dibangiya's have twelve exogamous clans (jaku) viz., Sundariya, Patriya, Kumataya, Airiya, Chitigaya, Chugrangaya, Charia, Dupia, Murangya, Lagachiya, Teliya and Kalia-Chakuya. The Jakus plays an important role in selecting the functionaries of the priestly council. Among the different functionary of the Dibangiyas, the chief priest is called the Bardeori who is invariably selected from Sundariyo clan only. Next to him, who assists the Bardeori is known as the Sarudeori who only comes from Patriyo clan. Again there are other assistant priests, viz., Barbhorali and Sarubhorali who are selected from Airiyo clan.

A typical Dibangiya residential house consists of a structure built on piles. The family of the Dibangiya society is mostly a joint one. Rice is their staple food; along with the rice they take locally produced vegetables, wild floral parts, meat, fish, etc. They also prepared a locally brewed rice beer (suje), which is considered to be a prestigious item for entertaining the guests. Their society is patrilineal in nature and monogamy is the ideal form of marriage prevalent among them. They are mainly agriculturalists. They are also found to be engaged in other subsistence economy like fishing, weaving, wage earning ,etc.

Results and Discussion

Religion plays an important role in the socio-cultural life of the Deoris of Bahgara village. Religion may be termed as any set of attitudes, beliefs and practices, rites and rituals related to supernatural powers, that power may be force, spirits, ghosts, god, demons and others. Religion is considered as the beliefs and patterns of behaviour by which human beings try to deal with the important problems that cannot be solved by known technology or organisational techniques. To overcome these limitation people turn to the manipulation of supernatural powers. Supernatural powers or forces are those powers which are believed to be not human or not subjected to the laws of nature.

The exact nature of supernatural differs from people to people and society to society. For some supernatural may be constituted of ghosts and spirits, for others it may be manifested through a pantheon of anthropomorphic gods and goddesses, or a single high God, and so on. The villagers of Bahgora Deori Gaon referred their religion as 'kundi'. Kundi Mama is the chief parochial deity of the villagers and the word 'kundi' has its root in the name of the principal deity of the Dibangiya Deori. According to them Kundi Mama is the creator of the entire universe. The word Kundi Mama is indispensably related to god and goddesses where Kundi and Mama represent Purush(male) and Prakriti(female) respectively. Kundi Mama is also referred as Burha Burhi or Gira Girachi . They also worship Balia Baba or Pichadema and Tamreshwari or Pichachidema, who are believed to be the eldest son and daughter of the same supreme God. All these deities are worshipped for the well being of the masses and also for agricultural improvement. Traditionally the Deori society is devoid of any idol worship.

Religious rites and rituals are performed in a place of worship where people offer prayer to appease the supernatural for the benefit of the self as well as for the whole community. The place of worship plays a significant role in the socio religious life of a community. The Dibangiyas of the study village also have a common and permanent worshipping place for the deities, known as Midiku which means the abode of deity. The people shows great devotion and respect to the Midiku . The site of the Midiku is located on the eastern side of the village. The Midiku consists of four structured houses. The house which is erected at the centre of the Midiku is the main house which is the abode of Kundi Mama and is known as Kundiku which is constructed in two different parts. In one part the supreme deity is propitiated by the priest by offering items like soaked gram, banana, sugarcane, betel nuts, betel leaves, incense stick , earthen lamp, etc. Only uncooked food are allowed to offer in that place whereas another part of the main house is the place where sacrificing of birds and animals takes place to propitiate Kundi Mama. The machete for sacrifice is kept at the main house of the shrine. The machete is considered to be a sacred object and is believed to have great power and religious value.

On the left side of the Kundiku is the abode of goddess Tamreshwari or Pichachidema known as Pichachiku , and on the right side of the main house, another house known as Pichademaku is constructed to appease Balia Baba or Pichadema. The house which is situated in the compound of the Midiku but separated from the abovementioned houses is known as Morong. Morong is a hall constructed for congregation, where members of village assembled to celebrate religious functions. It is the place where sacrificed birds and animals and other food items

are cooked and consumed by the members after the performance of community rituals.

The propitiation system at the shrine is principally performed by the priest. In all societies, there exist individuals, whose job is to guide and supplement the religious practices of others. Such individuals are skilled at contacting and influencing supernatural beings and managing supernatural forces. Among the Deoris of the study village the religious duties, rites and rituals are conducted by a set of religious functionaries, namely Bardeori, Sarudeori, Barbharali and Sarubharali, invariably selected from four different clans. It has been already mentioned that the Bardeori is selected from Sundariyo clan only, Sarudeori from Patriyio, Barbharali and Sarubharali from Airiyo clan respectively. The priests among the Deoris are always a male and each priest is entitled for different duties to carry out. Bardeori is the chief priest and also the most respected person of the village. He is a full time ritual specialist as well as custodian of the Midiku. For the selection of Bardeori the person concern should be healthy, honest and a man of good character. He should not be a person mauled by a tiger or bitten by snake earlier, nor excreta of a vulture or crow should have fallen upon him. The Bardeori alone can enter into the main house of the shrine and worship the deities by singing hymns and reciting incantations .He is also entitled to perform sacrifices of birds and animals related to different rituals. The second in the hierarchy of priests among the four is Sarudeori. He assists the Bardeori during the performances of rituals and sacrifices. He is also entitled to perform all the rituals in Midiku in the absence of the Bardeori. The duty of Barbharali is to collect dues of the temple and to provide animals for sacrifice. After sacrificing animals or birds it is the duty of the Barbharali to collect the blood of the sacrificed animals for offering to the deities. The last in the hierarchy of priest is Sarubharali who act as an assistant of Barbharali for management of assets of the shrine.

In addition to the four priests there are some other officials to look after the activities of the Midiku. They are Bora, Barik, Pariya, etc. These office bearers are needed in all the rituals held in the shrine. The duty of Bora is to employ special workers to clean the shrine premises and to arrange the objects for rituals. Barik announces the news about the ritual date to the villagers a day before it is to take place and he also assist the priest on the occasions of the rituals. The duty of the Pariya is also to assist the priest in conducting rituals at Midiku as the probationary pupil of the priest.

The Deori priests are conferred with highest honour in the society. Rigid taboos are observed by them in their day to day life. As for example they should keep themselves pure by abstaining from having food prepared by other men and women of the village, they can take food prepared only by the members of their family, and are also debarred from cutting hair during the priestly life.

The Rites and Rituals

Observances of religious rites and rituals are integral to every community. Rituals are the means through which a person can relate to the supernatural. Ritual practices are often an expression of the belief that supernatural powers can be made to act in certain ways through prayers, sacrifice and various ritualistic activities. The Dibangiya Deoris of the village also observe various rituals throughout the year. In every rite which are performed in the village shrine, the deities are worshipped by the Bardeori by reciting incantations. The incantations and the spells are in oral form and they carry special meaning which is difficult for the common people to understand. The incantations can never be published or brought into written form as they believed that anyone trying to do so will face ill consequences.

While performing ritual in the Midiku , different offerings are made to the deities. Generally three types of propitiation system are followed while performing rituals in the shrine. They are Sattwaki, Rajasiki and Tamsiki. In the first phase known as Sattwiki , uncooked food and other items like soaked gram, banana, sugarcane, betel nuts, betel leaves, incense stick ,earthen lamp, etc., are used for offerings. To appease the god and goddesses different sacred incantations are recited by the Bardeori inside the shrine. After the completion of the first phase, the second phase Rajasiki starts. In this phase after presenting the wishes of all the villagers attending the rituals, the priests take a mark in their forehead with chandan (sandal wood) and give similar mark to all the people and after that they starts the decapitation of the birds and animals offered to sacrifice. Generally goats (black or white in colour), duck, pigeons (in pair), etc., are sacrificed. In the third phase i.e., Tamsiki, the flesh of sacrificed animals are cooked along with other dishes in the morong. After offering to the deities, a community feast is arranged where all the villagers take part.

The Dibangiyas of the village observe various rituals like Bohag Bisu, Magh Bisu, Chai-Labiruba, Makan Chiban, Saonia puja, etc. Wednesday is considered as the most auspicious day among the

Deoris for starting religious activity or any good work. Bisu is the main festival of the Deoris of the village and it has close association with their agricultural activities. The Bisu festivals are observed before starting the agricultural operation with unrestricted joy and merry making. They observe both Bohag Bisu and Magh Bisu every year which falls in the month of Bohag (April -May) and Magh (January- February) of Assamese calendar. Bisu is a community festival and a ritual called Bisu Puja is performed during Bisu in the village shrine. During Bohag Bisu puja all villagers irrespective of age and sex gather at the Midiku. The Bardeori with the three assistant priests offer prayer inside the Midiku and no one is allowed to enter the Midiku when the prayer is in progress. In the Bisu Puja sacrificing of goats, ducks, fowls etc., are made and after the puja and sacrifices all the villagers take part in the community feast.

The villagers also offer prayers to their ancestral spirits. They believed that the spirit of the ancestors never depart from the family but continue to live with the family in the form of a spirit. Therefore to appease the spirits they perform rituals for the welfare of the family members. During the day of Bohag Bisu, in the morning each family performs a puja called Mora Leruba to worship their ancestors. The puja is performed at the backside of the house where suje (rice beer) and kaji (a special curry prepared out of vegetables and flesh of fowls) are offered to the ancestors.

Another central aspect of Bohag Bisu puja among the Dibangiyas is the appearance of Deodhani where a particular man or woman is possessed by a supernatural power or spirit. That particular man or woman is considered as the personal communicator from a supernatural being who is directed to foretell about the future happenings of the village people and that is why all villagers respect this situation with awe and respect. In Deori society it is commonly known as Deo Utha. During the period when a person is embodied by a deity, offerings are made in the Midiku to propitiate them. The deities indicate their presence by entering inside the body and soul of some males or females. Under the influence of the deity some sort of extraordinary power and euphoria is generated which lifts that particular person to miraculous states of exaltation. The particular man or women even drinks the raw blood of fowls and goes into the state of trance and starts dancing with the tune of drum and cymbals. They generally predict ensuing events in the coming year in the village. Animal sacrifices are made to them and people worship them, offers prayer and sacrifices to gain favour.

Like Bohag Bisu, during Magh Bisu also a grand feast is arranged on the first Wednesday of Magh month,in the premises of Morong attached to the temple. The chief priest offers puja to the deities of the shrine and sacrifice of fowls is also performed.

The Bakat Makan or Bakat Moko Hareba ritual is a community ritual which is organised in the month of Falgun (February-March).This ritual is performed in the any Wednesday of the said month generally in an open area near the bank of river, pond or stream.Only male Bhakats and village priests perform this ritual by appeasing the deities for the well being of the village and community. Females are forbidden take part in this ritual. After the completion of the ritualistic activities the Bhakats and priests are offered with suje along with pork or meat of tortoise which are prepared by selected young males member of the village. After the feast the young boys perform Bihu dance and the villagers believe that only after performing the said ritual one can start dancing and prepare for the forthcoming Bohagiyo Bisu.

Chua Labiruba or Chai Labiba ritual is a ritual for purification which is performed before every ritualistic function. Before performing any kind of ritual at the shrine or before any household ritual, the Chai Labiba is performed. It is a simple ritual where few elderly male person(three or five) are invited who prays to the deities by sacrificing a chicken along with suje .

Saonia puja is observed during the month of Saon (July- August). This ritual is performed for paying tribute to God and Goddesses for better agricultural yield. During this ritual also the Bardeori of the village offers bananas, betel nuts, betel leaves, incenses, etc., to the deities and sacrifices fowls and pray for successful harvesting of paddy.

The Rites and Rituals in Relation with Principal Events of Life

The rites and ceremonies that mark the occasions such as birth, marriage, death etc., are often been called as rites of passage or crisis rite of an individual. Among most of the societies of the world, the performance of rituals on these occasions are found and all these are concerned with changes of status like at birth when a new person enters the society, at marriage when two persons unite and at death when a person leaves. Like any other community the Dibangiya Deoris of the village also perform certain kind of religious activities at the time of birth, marriage and death.

Among the Deoris a good number of beliefs and taboos are associated with the pregnant mother and

new born baby. A pregnant mother has to follow certain restrictions like she is not allowed to carry heavy objects, cannot take part in husking and grinding works, etc. After the birth of the baby, a sarai (disc on stand) containing uncooked rice, egg, betel nut, betel vine leaf, coins, etc., is placed as an offering near the bed of the mother by a women of the house for the well being of the new born baby. Till the period of releasing of the umbilical cord from the baby's body, the mother is thought to be unclean. This period is regarded as polluted period and the mother neither can enter the kitchen nor can she cook meal for any person during this period. Only after performing Hudi Labiruba which is a purificatory ritual, the household along with the new born baby and the mother breaks the impurity. To perform this ritual atleast seven members from seven different clans are invited as attendants for purifying the new born and the mother. A pig is generally sacrificed to mark the occasion. Miduji Jobura a curry prepared from wild arum leaves mixed with fish and black pepper is an essential item for the ritual.

Marriage is considered as an indispensible part of life of the Deori people. Clan exogamy is strictly followed in case of marriage. They have four different forms of marriage, namely Demasi Biya or Bar Biya ,Sochibasi Biya or Maju Biya, Surubasi Biya or Saru Biya and Meloni Biya or Gandharva Biya. Bar Biya is an expensive affair as all types of customs, traditions of Deori marriage are observed in this type. This type of marriage is arranged by parents and it is continued for three days. Maju Biya is quite less expensive than Bar Biya, which is also arranged by the parents of the prospective couple and continued for two days. Saru Biya is completed in a day and the expenditure of such marriage is quite low. The most widely prevalent type of marriage among the people of the village is Gandharva Biya or Meloni Biya or marriage by elopement, where the couple concerned take initiatives. In this type of marriage the boy with the help of some of his friends elope the girl on an appointed date. No formal ceremony is observed in this type of marriage. However a simple feast is arranged by the bridegroom family on the same day or on the following day of elopement. It is believed that if the eloped couple do not perform the Meloni Biya their offspring are debarred from celebrating their marriage. The important items of required in the marriage feast constitute fish, pork, rice beer, rice, vegetables, betel nuts and betel vine leaf. Suje (rice beer) is the most inevitable item for Deori marriage ceremony.

A series of rites and ritual are observed by the Dibangiya Deoris for the death of an individual as well as for the salvation of the disposed corpse. There are two primary ways of disposal of the dead body. Generally men and women dying natural death are cremated. But the dead bodies of children, pregnant women and epidemic cases are buried. In case of a normal death the Dibangiyas cremates. However, there are differences in the funeral customs related with the deceased. Usually the differences are observed in per se with the social status of the dead. For example when a man or women dies the chita (the funeral pyre) is erected with seven layers and five layers of firewood respectively. When a priest dies nine folds of firewood is laid. The dead body is duly honoured by them. Before carrying the corpse to the cremation ground, the dead body is washed with water and is adorned with a new dress. An egg is broken in the forehead of the deceased by the eldest son which is known as dujan labiduba. The significance of this ritual is to detach all kinship relationship with the deceased. Usually the eldest son puts fire in the pyre but in absence of the eldest son any male member of the family can perform his duty. A social taboo is observed by the members of the deceased familyS. On the fourth day a funeral ceremony is held followed by a feast. The final mortuary ritual among the Dibangiya Deori is known as Daha where all the villagers and the priests are invited. The priests and the elderly persons perform Suje Luguruba ritual to satisfy the soul of the deceased. After the end of the ritual a feast is organised where large number of chickens, pigs, rice beer is required.

Conclusion

The social structure of the Dibangiya Deoris are interwoven and interrelated with their religion and every sphere of life of the Deori people is guided by rites and rituals of their religion. The Dibangiyas are still found to be maintaining their tradition of aboriginal practices. Kundi- Mama is the supreme God of this group of people, who is worshipped at household as well as in community level. Besides the supreme deity they also worship Balia Baba and Goddess Tamreswari. The deities are propitiated at the Midiku , which occupies a central place in their socio religious life. The propitiation system at the Midiku can only be performed by the priests. There are a set of priestly council for conducting the rites and rituals in the village shrine. The priests are considered as the chief intermediaries between God and human. Only the priests could offer prayers and sacrifices in the shrine to appease the deities. The cult of sacrifice is a dominant feature of indigenous religious practices of the people in the village. They

offer sacrifices to the deities to ward off sickness, sufferings and afflictions and also for the well being of the village and community. Suje (rice beer) is a part and parcel of the socio ritual life of the Deoris of the village, which is offered to all the deities, ancestors and other supernatural beings. Without these offerings no ritual can be performed, nor do any socio cultural functions become complete. The main occupation of the community is agriculture and every harvesting activity of the village starts with appeasing of deities of the Midiku. Bohag Bisu is the main festival among the Dibangiyas which has relation with agricultural activities. The most considerable aspect of Bisu is that it must be started by a puja which they termed as Bisu Puja. The Bisu Puja is generally performed at the village shrine. Besides Bihu, there are host of rituals which have been performed by the villagers in their respective households or at the shrine during different time of a year. They also observe various rites and rituals in connection with the principle events of life. As for example, when a child is born certain rites are performed to ensure strength, good fortune and to protect the baby from the influence of evil spirits. There are other rites when someone gets married and funeral rites are performed to ensure safe passage into the immortal world. The Dibangiya Deoris have been maintaining their pristine traditional socio-religious practices intact. However they are found to be influenced by the beliefs and rituals of the neighbouring Hindu population of Assam, as a result of which some of the customary rules, values, norms of Assamese society have glued to their social life. With the contacts with the neighboring caste Hindus the people of the villages become acquainted with the Hindu Gods and deities and as such relating their own indigenous Gods and Goddesses with the Hindu pantheon is noticed. As for example, Kundi-Mama the supreme deity is believed to be the parochial version of Lord Shiva and Parvati, likewise Goddess Mirushi(goddess of wealth) is believed to be Goddess Laxmi of Hindu pantheon. The rituals like Asthi bisarjana,i.e., merging the ashes and bones of the deceased person in the nearby river as water of river equals with the holy water of river Ganga, bathing the dead body with turmeric and black gram etc among the Dibangiyas are outcome of their interaction with the neighboring caste Hindu inhabitants . Likewise use of santijal (holy water) or water containing basil leaves in a copper bowl is also a new element. The basil plant is sacred and used in all ritualistic occasions by the caste Hindus. Putting vermillion mark on the forehead by married women and removing the same after the death of the husband to mark the symbol of widowhood is percolated from the neighbouring caste Hindus of Assam. Though some changes can be seen in their contemporary socio-religious life yet the villagers have maintained most of the traditional elements in their day to day life. Although the influence of Hinduism is slightly visible among them yet the trend towards traditional indigenous beliefs and practices are still prominent.

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Review Article

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Approaches of Involvement of Male in Reproductive Health: Changing Paradigms in Anthropological Research

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Abstract

All culture have involved some system of explanation regarding conception, pregnancy, and childbirth and all have developed sets of beliefs and techniques for dealing with these mammalian and human processes. All societies have been able to connect the act of sexual intercourse to the onset of pregnancy, its outcomes and their survivals. Various cultures of the world, primitive as well as civilized, are sufficiently acquainted with the fact of biology to relate the pregnancy of a given women to the act of sexual intercourse. Culture influences not only how individuals are treated for their reproductive health problems within given systems of medicine, but also how individuals living within local communities define and experience their reproductive health. Reproductive health has emerged as an organizational framework that incorporates men into maternal and child health programs. For several decades, medical anthropologists have conducted reproductive health research that explores male partners' effects on women's health and the health of children summarizes exemplary research in this area, showing how ethnographic studies by medical anthropologists contribute new insights to the growing public health and demographic literature on men and reproductive health. The contributions of cultural anthropology, with its ethnographic tradition of in-depth, field based research and its central concept of culture. Cultural anthropologists have argued that gender is a key organizing principle of social relations, influencing both sex and reproduction. In this paper it is try to understand the wholistic characteristics and dimensions of the research in the reproductive health and involvement of men.

Keywords: Anthropological Approaches; Appraisal; Involvement of Male; Reproductive Health; Participation of Men.

Introduction

It is well recognized that in patriarchal settings such as India, hierarchical gender relations and unequal gender norms impact women's sexual and reproductive health and choice and act as significant obstacles to access of services and facilities. Equally, the achievement of good sexual and reproductive health may be inhibited by such structural factors as poverty and malnutrition, early marriage and inadequate educational and health systems. Although there are regional variations with women in the non tribal facing some what fewer constraints than those in the tribal, undoubtedly women in both regions are far less empowered to have a say in their own lives than are men. From an early age, gender role differentials persist: compared to adolescent boys, females have limited autonomy and face huge constraints on decision making, mobility and access to resources. Double standards ensure that young females are closely supervised as theirs. Chastity is inextricably linked to the family's honour (both natal and marital). At the same time, daughters are viewed as a 'source of misery' and a drain, through dowry, on the family's resources, while a son is 'the saviour of the family.' After marriage, a young woman is expected to remain largely invisible and under the authority of her husband's family. She has little say in domestic decisions and little freedom of movement.

Almost the only avenue available to enhance her prestige and even security in her husband's home is through her fertility, and particularly the number of sons she bears. Women who have borne only daughters can be subjected to harassment, and childlessness can be grounds for divorce or abandonment. Gender roles have significant implications for sexual and reproductive health and choice. Gender norms condone early onset of sexual activity, pre- and extra-marital casual sexual relations. Lack of awareness, lack of spousal intimacy and communication on sexual matters, and widespread gender based violence compound women's inability to negotiate safe sex, seek appropriate health care or experience a healthy pregnancy. Finally, gender roles that perpetuate the 'culture of silence' inhibit women from communicating a health problem or seeking prompt treatment unless it inhibits them from carrying out their daily chores. This 'culture of silence' is even more exaggerated for gynecological and reproductive morbidity that are so closely linked with sexuality.

Reason why WHO [94] recommended that there is a need to improve men's knowledge, access to and use of effective reproductive health care services. Programmes should be designed to raise awareness of men about risk, benefits of protection and the consequences of delayed and inadequate treatment of STIs. Programme managers should attempt to plan and implement a variety of interventions to involve men and monitor the impacts of these interventions. Research findings should be incorporated into programme planning. Couple counselling sessions may not be the ideal situation for the discussion of STI risk. With respect to the control of genital discharge syndromes, syndromic management for symptomatic men is more effective than for women in some epidemiological settings. Epidemiological evidence suggests that the effectiveness of STI control is likely to be greater if programmes focus on identifying infected men, as well as women. The contributions of cultural anthropology, with its ethnographic tradition of in-depth, field based research and its central concept of culture. Cultural anthropologists have argued that gender is a key organizing principle of social relations, influencing both sex and reproduction. Recent cultural anthropological research on men and masculinity, much of which falls outside of current conceptualizations of men's reproductive health, but which nonetheless forms part of the matrix of relations influencing men's as well as women's reproductive well-being [19]. At this juncture it has mentioned some of important issue which has proved to necessity of the present study.

Reproductive Health: An Anthropological View

All culture have involved some system of explanation regarding conception, pregnancy, and childbirth and all have developed sets of beliefs and techniques for dealing with these mammalian and human processes. Thus, all culture has a gynecology, embryology and obstetrics, and insofar as well as use system of child care and treatment, pediatrics [13, 25, 58, 80, 8, 34, 63]. Each of these arts and science is predicated upon statuses and roles of mother, father, child and those members of their social networks most intimately related to them. Gynecological, embryological, obstetrical, and pediatric values, tradition and practices framed within a cosmology and world-view of a people and their place in the universe, and within a particular type of social system. All societies have been able to connect the act of sexual intercourse to the onset of pregnancy, the two possible exceptions being among some Australian aborigines and the famous Trobiand Islanders of Melanesia who were thoroughly investigated by Malinowski [51]. In these two areas the fact of paternity is reportedly unknown and conception is assumed to take place through impregnation of the mother by "baby spirit" [53].

Although as a myth this belief is held in many parts of the world including the folk societies of the West [80]. Elvin [20] explored the sexual behaviour pattern of Baiga and reported that sexual intercourse between a men and women is necessary for the birth of a child, that is the normal rule, the Baiga would not, however, go so far as to say that a virgin cannot conceive, it just possible that she might become pregnant by drinking urine, in the folk-tales one girl drinks a cup of jackal's urine and has a litter of jackal's cubs. Elwin [20] also reported that Baiga embryology diagnosis, the beginning of pregnancy by the stopping of the menstrual period for two months, and by the swelling of the breast, if the nipples grow black, it is believed that a boy will be born, if they turn brown, it will be a girl.

Various cultures of the world, primitive as well as civilized, are sufficiently acquainted with the fact of biology to relate the pregnancy of a given women to the act of sexual intercourse. It is of course true that native lore regarding the physiological processes of gestation is highly variable from area to area in the world. Some primitive groups, while they recognize that coitus is the normal cause of pregnancy, entertain the notion that women may conceive in other ways. The South African Hottentot, for example, have a myth telling of women who became pregnant by eating a certain kind of grass. The mythology of the Bontoc Igorot of the Philippine Island is so ridden

with magical tales that magical conceptions are not regarded as improbable. If the menstrual discharge is washed downstream it may be used by spirit to create heroes of great power. In myths, the frog motif is popular; the frog, lapping up the spittle of a hero, is impregnated and gives birth to an attractive and talented child [81].

Culture influences not only how individuals are treated for their reproductive health problems within given systems of medicine, but also how individuals living within local communities define and experience their reproductive health. One area of particular interest involves the cultural determinants of reproductive health. It is clear that culture, as a predominant system of beliefs and practices shared by a group, affect reproductive health outcomes. Discussion of culture in reproductive health initiatives to date has tended to focus on the beliefs and practices concerning the origin and treatment of reproductive health problems, particularly as they present barriers to biomedical intervention [19].

Cultural anthropologists, too, have emphasized the importance of social relation such as division of labor, social status, and household's arrangements, in determining the nature of family life and child well-being. In particular, the cultural and personality school of anthropology has emphasized the effects of early childhoods experience with parents, as determined in part by these social structures, in determining adult behavior. Such a perspective focuses on the way culture reproduces itself, suggesting that parenting behavior is in part determined by cultural norms and values, which are then impressed upon children at early ages in ways that will affect their adult lives while the culture and personality perspective has been challenged as overly deterministic, the perspective has made valuable contributions in understanding cross-cultural patterns of fathering, such as the effects of father absence on offspring, ceremonies of male initiation, and male segregation at puberty[86].

Ethnographic account offering descriptions of the majority of the cultures of the world are not generally helpful in explaining the ways in which the various primitive groups determine when conception occurs and pregnancy begins. As nearly as can be ascertained, cessation of the menses is symptomatic of pregnancy in the belief and according to the observation of nearly every society. To choose an example from Africa: the Loma and Gbunde of Liberia take the view that conception may follow immediately upon menstruation may. There after the disruption of menstrual regularity is regarded as proof of pregnancy. But some other societies utilize other symptoms as indication. Various scattered groups over the world look for changes in the breast as well as cessation of the menses. Morning sickness is considered as evidence of pregnancy by some primitive groups [81].

Batchelder [4] described the anthropologists have found that in reality, modern societies have simply made the process of physical abuse and offspring selection more subtle, masking it with technology in simpler societies children are subject to traumatic, mechanical and violent health threats that we consider primitive and severe. However, in modern industrial societies children are subject to more subtle, cognitive and metabolic abuses that are just as damaging to health. According to anthropological studies many of the ongoing physical and emotional problems associated with menstruation in modern, industrial societies appear to be largely a product of urban-industrial lifestyles. Mead [57] found that it was unusual for a young woman in Samoa to complain of menstrual problems. Shostak [79] found that the South African people, the Kung, did not experience PMS or menstrual syndrome and noticed no mood changes around this time of month. Howell[35] also found that menstruation was rare among the !Kung San, Harrell[32] suggests that regular menstrual periods may well be unusual urban-industrial societal effects that reflect low birthrates and short or absent interludes of nursing babies associated with the use of baby bottles.

Mead [56] extensively illustrated about human reproduction, she described if we return then to the small boy and the small girl living in a world where the bodies of males and females of all ages are slightly clothed and simply accepted, we find that the small girl learns that she is a female and that if she simply waits, she will someday be a mother. She [56] concluded that in such a society women are handicapped by their womanly qualities. Pregnancy and nursing are hated and avoided if possible, and men detest their wives for being pregnant. Men see women as a kind of human beings over whom they will have to right and through whom they can be injured.

Reproductive Health and "Men": An Anthropological View

Reproductive health has emerged as an organizational framework that incorporates men into maternal and child health (MCH) programs. For several decades, medical anthropologists have conducted reproductive health research that explores male partners' effects on women's health and the health of children summarizes exemplary research in this area, showing how ethnographic

studies by medical anthropologists contribute new insights to the growing public health and demographic literature on men and reproductive health. Dudgeon and Inhorn [18] explored reproductive rights, examining the concept from an anthropological perspective. Reproductive health policymakers (and their critics) have recognized the need for qualitative research to improve understanding of male involvement in reproductive health, as well as men's reproductive health problems [17, 54, 71]. Because of its long tradition of research among non-western populations, as well as its qualitative research strategy of ethnography, the discipline of anthropology has been seen by many as a means to investigate local reproductive norms and problems, as well as to implement a gendered perspective that does not assume universal meanings of masculine and feminine. Anthropology has, to date, been characterizes as a discipline suited to complement biomedical health interventions with qualitative knowledge that will improve the deployment of those interventions [19].

Anthropology is rapidly growing in this complementary role to international health efforts [77, 87]. Nonetheless anthropology has more to offer than local knowledge in the area of reproductive health. For one, medical anthropologists have often taken a critical stance toward international health efforts, [48, 52, 60] including men's incorporation in reproductive health interventions [9]. From this critical medical anthropological perspective, culture influences the very character of biomedicine, both as a western discipline and as a form of health care now found in many non –western sites around the globe [40].

Dudgeon and Inhorn [19] explored how anthropology, as a humanistic social science, is particularly well suited for assessing men's reproductive health needs, through its emphasis on both the specificity and variability of those needs within local cultural contexts. Relying on a biosocial perspective, anthropologists who focus their research on reproduction generally argue that local biologist, as well as local cultures, influence men's reproductive health definitions and needs. Understanding men's reproductive health needs requires framing men's health and well-being within local contexts the traditional focus of anthropology.

One of the more important shifts emerging since the Cairo and Beijing conferences has been the explicit adoption of the concept of gender as an important determinant of reproductive health. Borrowed from linguistics and deriving from work in feminist theory and humanistic social sciences such as anthropology, the concept of gender was originally used to describe of behavior and identity usually ascribed to either men or women; such attributes could not be determined by biological sex, and thus were referred to as gender roles and identities [45]. However, the concept of gender has been extended by some theorists to describe a set of power relationships loosely organized around biological has been used to account for the different kinds of illnesses experienced by men and women, which are often attributable to power differentials [77]. Ironically perhaps, this "gender lens" has only recently been focused on men even though men have long been at the center of social scientific investigation and health research, often to the exclusion of women [39, 73]. Only recently have men as men-that is, as gendered agents, with beliefs, behaviors, and characteristics associated with but not dependent upon biological sex – become subjects of theory and empirical investigation within the social sciences, [10-11, 78] including in anthropology [5, 30, 50]. While no single framework for the study of men holds, attempts have been made to explain general patterns in male identity and behavior.

Researches in many fields such as medical anthropology and medical sociology have begun to draw connections between gender and men's health [6, 16, 49, 59, 76, 95]. In general, such approaches argue that numerous aspects of health, ranging from accidental deaths to cardiovascular disease is conditioned not only by differences between male and female physiologies, but also by the culturally specific socially constructed gender roles and identities that men and women perform. Courtenay [12] has argued that there is a reciprocal relationship between masculinity and health, stressing that men's health problems are often produced by men's enactment of masculinity, and that cultural norms and expectation reinforce these enactments. In addition, some researchers have observed that certain aspects of health and illness helps define hegemonic masculinity [76]. For example, certain markers of health are emphasized over others (e.g., men's muscle mass), markers that may not fit biomedical models for good health [47]. Moreover, illness in general may be characterized as unmasculine, and some disorders, such as infertility and erectile dysfunction, are seen as particularly emasculating [37, 38, 89]. In some cases, men's health disorders, such as benign prostatic hypertrophy (BPH), can be characterized as "culture-bound syndromes," given differential (and often profitable) emphasis in diagnosis and treatment by doctors and pharmaceutical manufactures. Not surprisingly, many of the aspects of health most closely tied to

masculinity involve reproduction and sexuality. Masculinity affects reproductive and sexual health insofar as sexual behaviors play key roles in defining gender role and identities [14]. Gender approaches stress the culturally constructed meanings of sexual practices in the main demonstrating that other- or same-sex sexual behaviors are not isomorphic with universal definitions of hetero or homosexual, straight or gay identities [33, 50]. In addition, attention has been drawn to the importance of particular sexual behaviors- many of them unhealthful for men and women; for performance of masculinity. Often listed among such practices is sexual promiscuity [23] and avoidance of contraceptives[88]. Such behaviors are theorized as being in a dialectical relationship with masculinity, with the behaviors both contained by and part of the basis for masculine identities and roles.

Defining Reproductive Health

World Health Organization [91] defines "reproductive health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". Reproductive health addresses the reproductive processes, functions and system at all stages of life. Reproductive health, therefore implies that people are able to have a responsible, satisfying and safe sexual life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so. Implicit in this last condition are the right of men and women to be informed of and to have access to safe, effective affordable and acceptable methods of fertility regulation of their choice and the right of access to appropriate health care services.

For both women and men, reproductive health reflects the impact of health in infancy and childhood as well as in adult life, and beyond reproductive age as well as within it. Reproductive health sets the found for human sexuality regardless of whether it leads to reproduction. Because of the HIV/AIDS pandemic, which has demonstrated the implications of sexuality for health and for social and development maters, human sexuality is now high on the agendas of many national and international agencies and organizations [93].

ICPD Programme of Action [41] not only endorsed this view of reproductive health but also helped operationalize what reproductive health care services should include, as follows: "Reproductive health care in the context of primary health care should, inter alia, include: family-planning counseling, information, education, communication and services; education and services for prenatal care, safe delivery and post-natal care, especially breast-feeding and infant and women's health care; prevention and appropriate treatment of infertility; including prevention of abortion and the management of the consequences of abortion; treatment of reproductive tract infections; sexually transmitted disease and other reproductive health conditions; and information education and counseling, as appropriate, on human sexuality, reproductive health and responsible parenthood"[93]. Gender differentials in regard to poor reproductive health stem, in part, from biological factors. For example, women alone face the health hazards associated with pregnancy and childbirth; women with STDs may have no symptoms and, are more likely than men to experience serious complication, such as infections and infertility; and women appear to be more susceptible than men to infection by the AIDS virus because their physiology is more vulnerable to sexual transmission. Furthermore, women experience the health hazards associated with abortion or the inconveniences associated with menopause and increased morbidity.

Other gender differentials stem from social economic and cultural factors. Women's lack of autonomy in sexual relationship can lead to early and excessive child-bearing as well as exposure to STDs and violence. Women who lack decision-making power and control of money within the family often cut off from essential health services, such as emergency obstetric care. Cultural practices, such as female genital mutilation, may lead to life-long disability. Although the burden of ill-health associated with reproduction affects women to a much larger extent than it does men, and few of the reproductive health problems that men face are life-threatening, these problems do affect men's quality of life and may have serious repercussions on women's health. In women, STDs, for example, often lead to infertility and cervical cancer. Some reproductive health problems, such as urological disorder, affect women and men. In women, genital-urinary disorders may remain non-symptomatic and undiagnosed for a long time. In men, these disorders tend to be associated with early signs, which lead to diagnosis and treatment. Other disorders, such as prostate and testicular cancer, affect men solely. Finally, problems like sexual dysfunction have deep psychological effects and may cause males to seek medical treatment and/or counseling.

Defining Male Involvement

"Male involvement" is used as an umbrella term

to encompass the various ways in which men relate to reproductive health problems and programmes, reproductive rights and reproductive behavior. Male involvement in reproductive health has two major facets : The way men accept and indicate support to their partners' needs, choices and rights in reproductive health and men's own reproductive and sexual behaviour.

Other terms that are often used in this context are male responsibility and participation. The terms "responsibility" stresses the need for men to assume responsibility for the consequences of their sexual and reproductive behaviour, such as caring for their offspring, using contraception to take the burden off their partner and practicing safer sexual behaviours to protect themselves, their partners and their families from STDs, including HIV.

The terms "participation" may seem self-evident since men de facto participate more than women in population and reproductive health programmes, as policy makers, media gatekeepers, religious leaders, managers and service providers, community leaders and heads of households. In this context, "participation" refers to men's supportive role in their families, communities and work-place to promote gender equity, girls' education, women's empowerment and the sharing of household chores and child-rearing. "Participation" also suggests a more active role for men in both decision-making and behaviours, such as sharing reproductive decision-making with their partners, supporting their partner's choices and using contraception and/or periodic abstinence. "Changes in both men's and women's knowledge, attitudes and behaviour are necessary conditions for achieving the harmonious partnership of men and women. Men play a key role in bringing about gender equality since, in most societies; men exercise preponderant power in nearly every sphere of life. It is essential to improve communication between men and women on issues of sexuality and reproductive health, and the understanding of their joint responsibilities, so that men and women are equal partners in public and private life" [93].

Reproductive Health and Men

In the public health sector, family planning services have long been offered mostly through the existing outlets of maternal and child health centers, which only women and mothers attend. Partly for this reason, population, development and health agencies have largely ignored men's influence on women's reproductive decisions and actions and the reproductive health need of men. At present, decision makers are examining programmes to involve men in reproductive health decision, including family planning, for several reasons: programmes have found that an acquired immunodeficiency syndrome (AIDS) pandemic and the spiraling rates of sexually transmitted diseases (STDs) have given safer sexual practices and the condom renewed important. Male involvement programmes are designed to address specific problems or impediments, such as men's disapproval of their partner' use of contraception; rising rates of STD/HIV infection and out-of-wedlock pregnancy; restrictions on condom advertising, promotion and distribution; and underutilization of vasectomy services. Still, a gap remains between the rhetoric promoting male involvement and the reality of female-oriented reproductive health programmes. The reasons are several. The major barriers to expanded male-involvement programmes are as follows:

Socio-Cultural Concern

In male-dominated socio-cultural environments, men may fear losing control if they share decision-making and discuss reproductive goals with their spouses. Community norms may promote large families. In difficult economic circumstances, men may look to their children for old-age-support. Other special socio-economic circumstances, such as the separation of migrant workers from their families, present higher risks for men of contracting STDs and human immunodeficiency virus (HIV).

Lack of Political Dedication

Many high-level decision makers have yet to take the necessary steps to institute male involvement in existing programmes. Merely taking and interest in this possibility can cause changes in staff attitudes and practices;

Insufficient Information

The lack of up-to-date information on male attitudes, knowledge and practices related to reproductive health impedes programme planning. Few male-involvement programmes have been evaluated.

Policy Impediment

Outdated policies and regulations hinder male access to contraception. These include the following: high import duties on condoms: restrictions on condom sales and advertising, including sales to the under-aged or unmarried; and strict eligibility

criteria for obtaining vasectomies. Policies in the work-place may discourage men from sharing household chores and child-rearing.

Provider Bias

Men are more concerned about their partners/ spouses and children than the stereotypes would suggest. However, stereotypes are hard to change. The assumption of many health-care providers that men are uninterested in taking responsibility for family planning has become a self-fulfilling prophecy. Most reproductive health/family planning service delivery systems are almost entirely oriented to women and provide little or no information about male contraceptive methods. Health workers are sometimes poorly trained in counseling men about safer sexual practices and male methods and may communicate negative rumors about them. Recent field experience has shown that well-targeted, focused male-involvement programmes can have an impact on both male and female behaviors related to reproductive health. Such behaviors include more responsible sexual behavior, increased contraceptive use and grater communication between partners. These behaviors reflect the major goals of male-involvement programmes, which are to: Provide support for women's actions related to reproduction and respect for women's reproductive and sexual rights, improve male and female reproductive health and encourage safer and responsible sexual and reproductive behavior in adolescents and young men (adolescents : up to 19 years old; young men : 20-24). Recent studies and programme experiences are also challenging many of the traditional assumptions about male-involvement activities, including the following:

Feasibility

Programme mangers assume that men are more difficult to reach than women. In reality, men can be approached in many non-clinical setting. Moreover, men pay attention to the mass media and are generally more literate than women;

Conflict

Despite, complex motivational resistances to changes in men's reproductive attitudes and behavior, studies have revealed that men are more favorable to family planning than popular wisdom assumed and are interested in learning more about contraception and in sharing responsibility for contraception with their partners. Most men want the same number of children as their partners do; male reproductive health services are best provided as a constellation or package of various services or an array of interventions, preferably at or near the same site. Services can be provided in a variety of settings, including Primary Health Care facilities, maternal and child health/family planning clinics, male-only clinics, and clinics for treatment of STDs, mobile units, and military hospitals. Other major sources of services and information are subsidized commercial sales, community outreach, employment-based programmes, youth programmes and organized group.

Traditionally, health care providers and researchers in the field of reproductive health have focused almost exclusively on women when planning programmes and services, especially with regard to family planning, prevention of unwanted pregnancy and of unsafe abortion, and promotion of safe motherhood. In recent years, efforts have been made in many countries to broaden men's responsibility for their own reproductive health as well as that of their partners. Measures are also being taken to improve gender relations by promoting men's understanding of their familial and social roles in family planning and sexual and reproductive health issues.

International Conference on Population and Development (ICPD) Programme of Action,[41] urged that:

"….special effort should be made to emphasize men's shared responsibility and promote their active involvement in responsible parenthood, sexual and reproductive behaviour including family planning; prenatal, maternal child health prevention of sexually transmitted disease, including HIV; prevention of unwanted and high-risk pregnancies; shared control and contribution to family income, children's education, health and nutrition; recognition and promotion of the equal value of children of both sex. Male responsibilities in family life must be included in the education of children from the earliest ages. Special emphasis should be placed on the prevention of violence against women and children…"

The above challenge calls for more intense efforts of foster partnerships between men and women which help men identify with the magnitude and range of reproductive illnesses which affect women. The philosophy embodied in the Programme of Action combines a primary health care approach with a human rights dimension.

Research has shed some light on the gaps in our

knowledge of reproductive health issues as they relate to men, but we have little information about programme issues and how such research could improve programme operation ad service delivery. WHO Country Offices are often consulted by programme managers and policy-makers for advice on strategies for including men in the delivery of reproductive health services.

Reproductive health practitioner have recognized that the failure to target men in programmes has weakened the impact of reproductive health programmes since men can significantly influence their partners' reproductive health decision-making and use of health resources [55].

Moreover, studies have shown that men who are educated about reproductive health issues are demonstrate greater responsibility for their children [29]. Most importantly, women express great interest in wanting their partners to be involved in joint reproductive health decision-making. For example, a study in Ecuador surprisingly showed that 89% of women wanted their partner to accompany them on their next family planning visit and 94% would have liked their partner to be present during their family planning session [75].

Although 1994 was a watershed year for male involvement, Engender Health had already been working with male clients for 50 years on the issue of vasectomy, and the Cairo mandate provided an important framework for considering men's constructive involvement in reproductive health from a more holistic perspective. With this framework in mind, Engender Health initiated a formal Man as Partners programme in 1996 in response to client, provider and institutional request, which became even more frequent and urgent with the onset of the AIDS epidemic.

Gender and Reproduction

Men have a stake in reproductive health through their multiple roles as sexual partners, husbands, fathers, family and household members, community leaders and gatekeepers to health information and services. To be effective, reproductive health programmes need to address men's behaviour in these various roles.

The first reason to involve men in reproductive health stems from the need to promote observance of human rights and the need to enforce equity, i.e., an obligation from the gender and reproductive rights perspective. Men are partners in reproduction and sexuality and, therefore, it is logical that they equally share satisfying sexual lives and the burdens of preventing disease and health complications.

Another reason to involve men in reproductive health matters is that they are responsible, socially and economically, at least in part, for their children. It is hoped that involving men in reproductive decisions will forge a stronger bond between them and their offspring and results in greater responsibility for their families' well-being.

Male Reproductive Health Needs in Information and Services

Men need information, counseling and services to address a wide range of problems and concerns related to reproductive health. Many men are poorly informed regarding sexuality and reproduction and need information about male and female anatomy, contraception, STD and AIDS prevention and women's health care needs during pregnancy and childbirth. They also need confidence and guidance on how to share decisions and negotiate choices with their partners. Clinical services are needed to address common problems, such as uro-genital infections, STDs and infertility and to provide voluntary male sterilization. Depending upon the availability of treatment facilities screening for prostate and testicular cancer may be appropriate.

Knowledge of Family Planning

Most men have heard of modern contraceptive methods. In 11 out of 15 countries (DHS) with recent national surveys, more than three in for married men recognized at least one modern method. Surprisingly, in most of these countries a larger proportion of men than women had heard of a method. The pill was the most-recognized method, followed by the condom and female sterilization. Except in Bangladesh, Rwanda and Kenya, most men had not heard of vasectomy [22].

Use of Male Contraceptive Method

Approximately one third of the women surveyed in developing countries report that they are using a contraceptive method involving male participation or cooperation. In addition, a number of men have been motivated to undergo voluntary sterilization, a permanent method. Others are motivated to use temporary contraceptive methods. About 5 % of married couples in the developing world rely on vasectomy for pregnancy prevention [28] and an equivalent proportion relies on condoms. Usages of these two methods are highest in Asia and generally low in other regions. Periodic abstinence and

withdrawal are not widely used in most developing countries, although there are some notable exceptions [92] For example, withdrawal is the most popular methods of fertility regulation in Turkey, reported by 26 per cent of currently married women [93] in 12 out of 18 developing countries with comparable data the use of contraceptive methods requiring male participation has increased over the past decade. Condoms, which protect against both unwanted pregnancy and STDs, can be made widely available in various non clinical settings. Nevertheless, health providers can play an important role in educating men on their protective role and correct use. Health agencies need to give special attention to young men, since they have a tendency to adopt risk-taking behaviours (such as unprotected intercourse, multiple partners and alcohol and drug use) and are often the prime instigators of early child-bearing. In many areas health services largely ignore the problems of adolescents, since they are generally in good health and do not fit neatly under either pediatrics or adult medicine.

Involvement of Men to Increase Contraceptive Prevalence

Approximately one third of the world's couples are using a male-dependent contraceptive method – condom, vasectomy, withdrawal or periodic abstinence or traditional family planning methods [28] yet, most family planning agencies devote only a small portion of their budgets to male services and outreach. In most developing countries, men are man or untapped market for family planning programmes [31]. Family planning programmes have focused primarily on women because of their direct involvement in child-bearing and the predominance of effective female methods. However, in cultures where men dominate reproductive decision-making, as in sub-Saharan Africa and some Muslim cultures, the exclusion of men from reproductive health, including family planning and sexual health activities may contribute to low levels of the utilization of such reproductive health services among women [21]. Involving men in outreach could increase contraceptive adoption and continuation rates. For example, a study in Ethiopia found that couples in which the husbands participated in home-visit talks were more likely to initiate contraceptive use and to be using modern contraception one year after the visit than couples in which only the wife participated [84].

In countries where contraceptive prevalence has plateau at approximately 30-40%, overtures to men could yield new acceptors. Just as making more contraceptive methods available raises contraceptive prevalence involving men in family planning could increase prevalence in several ways: by providing alternatives to couples dissatisfied with their current method; by increasing male contraceptive use; by promoting greater discussion between sexual partners; and by changing male attitudes regarding contraception thereby enabling women to practice contraception [7].

Involvement of Men in Women's Reproductive Health

If there are few evaluated reports about men's involvement in family planning, there are even fewer about men's involvement in the maintenance of women's reproductive health. Toubia [85] reported on a program in Mali, which aimed to encourage men to accompany their spouses to family planning and gynecological services. During the Indian program, men were given information about antenatal care services, information about diet, nutrition and weight gain during pregnancy, and information about contraception. Using information gleaned from 113 structured interviews and 13 in-depth interviews, the study compared an intervention group with a nonintervention group. Men from the intervention group had a greater knowledge of the importance of antenatal care services, and their partners made more visits to antenatal care clinics.

Involvement of Men in ANC and PNC

Study of Premi and Mitra [70] reveals that the frequency of Baiga males' involvement in Antenatal Care (ANC) increases when their wives have had ANCs at least once in the past. This creates in them a sense of awareness of the mandatory nature of ANCs. They were seen escorting and accompanying their better halves thereafter to subsequent ANC check-ups. On the other hand, if the ANCs are alone at home, then, in such a case they do not feel the need of any involvement in their wives' ANCs, as they could depend on the other members of the family for needed assistance. Determinant of male involvement in Postnatal Care (PNC), their educational status and that of their wives, the benefits taken from ANCs, are to PNCs- such services, their involvement in ANCs, their being advanced in age at the time of their marriage, and their wives' taking advantage of the PNC facility by undergoing the investigations at least once earlier - such are the prominent features and aspects of male involvement.

Men and the Encouragement of Accountable Paternity

Although there have been a number of recent

ethnographic studies that have examined aspects of fatherhood in various developing countries, there were only two reports of an intervention in a developing country that aimed to foster men's involvement with their children. Johnston-Pitt and Jiji [43] reported on a Jamaican initiative, 'Fathers Incorporated'. Fathers Incorporated was a club for men that was set up to promote a positive image of responsible fatherhood. Both reports were descriptive, rather than analytical, but were included because they gave details about the only program documented evaluating men's in sexual health promotion 393 in the literature that was specifically set up to promote responsible fatherhood.World Health Organization, Geneva [94] recommended. Men have a unique role to play in promoting safe motherhood; they should not be viewed as passive onlookers or mere obstacles. Men could be as greatly affected by the social, cultural and economic complexities of safe motherhood as women they needed to be adequately informed and involved. Men are adversely affected by the deaths of their wives and female relatives; they need support to recognize factors which contribute to maternal deaths. Men receive little support to encourage their involvement in and knowledge of pregnancy and delivery of care. In some settings, men are receptive and eager to participate in safe motherhood campaigns and to be active partners for their wives during pregnancy and child birth. Women want men to be involved as partners or advocates for greater access to care and a better understanding of their needs during and following pregnancy. In most countries the public sector may provide routine support, but male involvement programmes have not been regarded as a public sector issue. Reason why there is a need to outline a set of interventions for men that can be tested. Research should provide a basis for the development of policies for male involvement. Support should be provided for operations research at the country level to test relevant intervention programmes. Society should mobilize support to put as much pressure on men as on women research should identify the constraints on mobilizing men. More research is needed on the socioeconomic impact of maternal deaths, in particular in young mothers.

Male's Contribution on Female's and Children's Health

The ways in which men influence women's health are numerous [26]. As husbands, boyfriends, fathers, brothers, and friends, men can have a positive effect on women's health by: using or supporting the use of contraception such that sexual partners are able to control the number and timing of pregnancies; encouraging women to have adequate nutrition during pregnancy and providing the needed physical, financial, and emotional support. Involving men in reproductive health has been found to have a positive impact on women's and children's health in a number of ways, including improving MCH care, preventing or reducing STI/HIV/AIDS transmission, and improving contraceptive use-effectiveness and continuation. Furthermore, men participating in antenatal education tend to know more about family planning methods and are more concerned about their partner's nutritional needs during pregnancy [72]. A study in Egypt has found that husbands who received counseling at the time of their wives' abortions were more likely to be supportive during the recovery period [1]. Enlisting men in the fight against STI/HIV/AIDS is particularly important given that men frequently transmit STIs to their monogamous partners. Research has shown that married women's greatest risk factor for STIs is the sexual behavior of their husbands [36, 27]. Men are much more likely (eight times) to transmit HIV to women through repeated acts of unprotected sexual intercourse than vice versa [64]. Studies have shown that involving men can increase contraceptive adoption, client satisfaction, contraceptive use effectiveness, and contraceptive continuation. Randomized trials have found that contraceptive adoption was significantly higher among women whose husbands were included in contraceptive counseling compared to women whose husbands were not involved [24, 84]. Several studies have shown higher contraceptive continuation among clients whose husbands have been involved in contraceptive counseling. A study in Madagascar found that women were more likely to continue using Norplant implants if their husbands had been involved in the counseling process [82] .

Involvement of Men in the Prevention of Unnecessary Pregnancy

Many of the reports available in the literature are less about the effectiveness of men's involvement. Evaluating men's in sexual health promotion 391 than about evaluating family planning services and making suggestions about the ways services might change to involve more men. Reports/ research in this genre include Premi and Mitra, [70] report of AVSC International's (now Engender health) [3] 'Men as Partners Initiative' and Wells' [90] reviews on reproductive and sexual health services for men, and the Johns Hopkins University [42] review of 20 men's family planning programs from Africa, Asia and Latin. These reports found that, contrary to what

some supposed many men wanted to be involved in family planning programs and that those programs in which men were viewed as caring partners rather than as irresponsible adversaries were successful in involving men. There are a number of reports of interventions that have involved men in family planning programs. AVSC International [2] presented findings from the eight family planning clinics that they had run in Colombia since 1985. The study found that the clinics were successful in attracting male clients. AVSC attributed this success to their policy of offering a brief counseling session to help men articulate their needs and talk about their doubts before they attended medical consultations. Another important element cited by the report was the policy of encouraging couples to seek services together. In Pakistan, AVSC International [3] carried out six case studies to evaluate affiliated projects that aimed to increase men's involvement in family planning. The study found that the projects were successful at reaching out to and involving men through a combination of extensive outreach work, the introduction of 'no scalpel' vasectomies, and regular meetings with the press, religious and political leaders aimed at promoting changes in the women's status and a reduction in family size. Population Council [67] reported on a program in Honduras designed to increase men's knowledge of family planning and to facilitate their role in reproductive decision making. Two strategies were used: one involved agricultural extension workers who were trained to give health education sessions based on a training manual, and the second extended an agricultural program, the 'Farm Management Plan', into areas of family planning through the use of a 'family man booklet. The program managed to involve men through low-cost strategies that were incorporated into already existing structures. There are several reports of interventions that successfully used interpersonal methods to increase men's knowledge of contraception and communication. These included: involving Muslim religious leaders in Bangladesh [62] in a program to teach about the connections between family planning and Islam; a peer education program amongst Tanzanian men; [66] seminars for health staff and a child spacing club based around a Malawi hospital and the training of agricultural extension workers to provide family planning information to men [67]. There are also several reports of mass media approaches that have targeted men's participation in family planning. Both Piotrow et al [65] and Kim and Muchek [46] evaluated the Zimbabwean Family Planning Council's 'Male Motivation Project'. The project used a wide variety of media: TV, radio, newspaper advertisements and articles, and a television soap opera. It also used language and images from competitive sport. Both studies found that men exposed to the campaign were significantly more likely to use condoms than men who were not. In one of the very few studies to test the efficacy of health education theory against the realities of men's involvement, actual evidence in the literature about the impact of men's involvement in the prevention of unwanted pregnancy, including increasing their own use of contraception and facilitating their partners' use, is generally sparse. Terefe and Larson's [83] report of a project for Ethiopian men are one of the very few studies to be actually concerned with evaluating the effectiveness of men's involvement as a health-promoting argument.

Data on men's attitudes toward family planning have only recently been collected. Research suggests that in many regions men view family planning favorably and can have a strong influence on the use of contraception. For example, research in Kenya suggests that contraception is two to three times more likely to be used when husbands rather than wives want to cease childbearing. [15] Results from Demographic and Health Surveys in 17 different nations in Asia, North Africa, East Africa, and West Africa support the following overall conclusions: Men and women have similar reproductive preferences and attitudes toward family planning (with the exception of West African countries). Men are no more opposed to family planning than women. Men tend to identify reproduction as a female responsibility [68]. In many countries, men are as favorable to condom use as women. Men's approval for and intentions to use family planning methods are similar to women's (with the exception of West African countries) [22, 74]. Some men are suspicious of family planning programs, believing they undermine men's power [61]. Results such as these are supported by qualitative studies. For example, a study of male involvement among five generations of a South Indian family found that men readily accepted condom use and vasectomy, even though they may not have liked some of the specific characteristics of the method [44]. Additional research is needed on both men's and women's attitudes toward use of and decision-making regarding reproductive health care services, with particular emphasis on how differences between men and women affect women's equality in decision-making.

Deterrence of Stds and Aids

The emergence of the AIDS pandemic has created

vastly increased interest in condom promotion, since the two major ways to prevent sexual transmission to HIV that causes AIDS are (a) changes in sexual behaviours (such as abstinence, monogamy and non-penetrative sex) and (b) condom use. Faced with the urgent need to control AIDS transmission and to give more attention to STD prevention and treatment, and since condoms are also a key means of protecting both men and women form STD infection, many Governments have permitted condom advertising in the mass media and have endorsed condom distribution and promotion initiatives. The HIV/AIDS pandemic has reached such an extent that educating men directly on the risks and consequences of HIV/AIDS and STDs should be regarded as a compulsory basic strategy in effective AIDS and STD preventions programmes.

Male Responsibilities and Participation

Men play a key role in bringing about gender equality since, in most societies; they exercise preponderant power in nearly every sphere of life. The objective is to promote gender equality and to encourage and enable men to take responsibility for their sexual and reproductive behaviour and their social and family roles. Governments should promote equal participation of women and men in all areas of family and household responsibilities, including, among others, responsible parenthood, sexual and reproductive behaviour, prevention of sexually transmitted diseases, and shared control in and contribution to family income and children's welfare. Governments should take steps to ensure that children receive appropriate financial support from their parents and should consider changes in law and policy to ensure men's support for their children and families.

Empowerment and Status of Women

The empowerment of women and improvement of their status are important ends in themselves and are essential for the achievement of sustainable development. The objectives are: to achieve equality and equity between men and women and enable women to realize their full potential; to involve women fully in policy and decision-making processes and in all aspects of economic, political and cultural life as active decision-makers, participants and beneficiaries; and to ensure that all women, as well as men, receive the education required to meet their basic human needs and to exercise their human rights. Recommended actions include, among others, establishing mechanisms for women's equal participation and equitable representation at all levels of the political process and public life; promoting women's education, skill development and employment; and eliminating all practices that discriminate against women, including those in the workplace and those affecting access to credit, control over property and social security. Countries should take full measures to eliminate all forms of exploitation, abuse, harassment and violence against women, adolescents and girls. In addition, development interventions should take better account of the multiple demands on women's time, with greater investments made in measures to lessen the burden of domestic responsibilities, and with attention to laws, programmes and policies which will enable employees of both sexes to harmonize their family and work responsibilities.

Integrating Population and Development Strategies

There is general agreement that persistent widespread poverty and serious social and gender inequities have significant influences on, and are in turn influenced by, demographic factors such as population growth, structure and distribution. There is also general agreement that unsustainable consumption and production patterns are contributing to the unsustainable use of natural resources and to environmental degradation. Section A seeks to integrate population concerns fully into development strategies and into all aspects of development planning at all levels. The sustained economic growth that results will help meet the needs and improve the quality of life of present and future generations. It will also promote social justice and help eradicate poverty.

Since ICPD Cairo [41] male involvement in reproductive health has become a fashionable topic and is mentioned in most forums addressing the issues of reproductive health, gender equity and empowerment of women. Very little however is known about how to enhance male involvement. Given the patriarchal social structure of South Asian countries, bringing about changes which strive to enhance male involvement and the gender equity this implies, is not easy.

Against this backdrop, it is interesting to take a look at how the Ministry of Health and Family Planning, Government of India, which is committed to implementing ICPD Programme of Action, is addressing these issues. What efforts have been made either by government or by NGOs to involve men in reproductive health and safe motherhood and what results have been achieved? Are innovative and replicable model(s) to enhance male involvement available?

Conclusion

Side by side such deliberations as recapitulated above, as an avowed and ardent student of anthropology. I learnt that all information and facts related to a society come to the fore only when they are studied in a prescribed method. So, such anthropological studies should be encouraged and recognized by government and its agencies. Side by side, the researchers in anthropology following the traditional and most credible method - "Ethnography" should compile and marshal the authentic, credible and verified information and facts. Or, they must pile up at least 3 to 6 months "participant observation". This has several advantages. By this process we can do cross-validation and cross- verification of the information collected and arrive at a more tangible and realistic principle. With more reliable authentic information and facts garnered, help in the progression and development of the society and the nation. Thus can be propounded the credibility and importance of the role of anthropologists and the participant observation - such a method's traditional recognition and superiority in anthropology can be re-established given a sound footing[69].

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Introduction

State the background of the study and purpose of the study and summarize the rationale for the study or observation.

Methods

The methods section should include only information that was available at the time the plan or protocol for the study was written such as study approach, design, type of sample, sample size, sampling technique, setting of the study, description of data collection tools and methods; all information obtained during the conduct of the study belongs in the Results section.

Reports of randomized clinical trials should be based on the CONSORT Statement (http://www.consort-statement. org). When reporting experiments on human subjects, indicate whether the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1975, as revised in 2000 (available at http://www.wma.net/e/policy/l 7-c_e.html).

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Present your results in logical sequence in the text, tables, and illustrations, giving the main or most important findings first. Do not repeat in the text all the data in the tables or illustrations; emphasize or summarize only important observations. Extra or supplementary materials and technical details can be placed in an appendix where it will be accessible but will not interrupt the flow of the text; alternatively, it can be published only in the electronic version of the journal.

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Include summary of key findings (primary outcome measures, secondary outcome measures, results as they relate to a prior hypothesis); Strengths and limitations of the study (study question, study design, data collection, analysis and interpretation); Interpretation and implications in the context of the totality of evidence (is there a systematic review to refer to, if not, could one be reasonably done here and now?, What this study adds to the available evidence, effects on patient care and health policy, possible mechanisms)? Controversies raised by this study; and Future research directions (for this particular research collaboration, underlying mechanisms, clinical research). Do not repeat in detail data or other material given in the Introduction or the Results section.

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List references in alphabetical order. Each listed reference should be cited in text (not in alphabetic order), and each text citation should be listed in the References section. Identify references in text, tables, and legends by Arabic numerals in square bracket (e.g. [10]). Please refer to ICMJE Guidelines (http://www.nlm.nih.gov/bsd/uniform_requirements.html) for more examples.

Standard journal article

[1] Flink H, Tegelberg Å, Thörn M, Lagerlöf F. Effect of oral iron supplementation on unstimulated salivary flow rate: A randomized, double-blind, placebo-controlled trial. J Oral Pathol Med 2006; 35: 540-7.

[2] Twetman S, Axelsson S, Dahlgren H, Holm AK, Källestål C, Lagerlöf F, et al. Caries-preventive effect of fluoride toothpaste: A systematic review. Acta Odontol Scand 2003; 61: 347-55.

Article in supplement or special issue

[3] Fleischer W, Reimer K. Povidone iodine antisepsis. State of the art. Dermatology 1997; 195 Suppl 2: 3-9.

Corporate (collective) author

[4] American Academy of Periodontology. Sonic and ultrasonic scalers in periodontics. J Periodontol 2000; 71: 1792-801.

Unpublished article

[5] Garoushi S, Lassila LV, Tezvergil A, Vallittu PK. Static and fatigue compression test for particulate filler composite resin with fiber-reinforced composite substructure. Dent Mater 2006.

Personal author(s)

[6] Hosmer D, Lemeshow S. Applied logistic regression, 2nd edn. New York: Wiley-Interscience; 2000.

Chapter in book

[7] Nauntofte B, Tenovuo J, Lagerlöf F. Secretion and composition of saliva. In: Fejerskov O, Kidd EAM,

editors. Dental caries: The disease and its clinical management. Oxford: Blackwell Munksgaard; 2003. p. 7-27.

No author given

[8] World Health Organization. Oral health surveys - basic methods, 4th edn. Geneva: World Health Organization; 1997.

Reference from electronic media

[9] National Statistics Online—Trends in suicide by method in England and Wales, 1979-2001. www.statistics.gov.uk/downloads/theme_health/HSQ 20.pdf (accessed Jan 24, 2005): 7-18. Only verified references against the original documents should be cited. Authors are responsible for the accuracy and completeness of their references and for correct text citation. The number of reference should be kept limited to 20 in case of major communications and 10 for short communications.

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