Current Research Journal of Social Sciences 2(6): 350-357, 2010
ISSN: 2041-3246

Submitted date: August 12, 2010 Accepted date: September 28, 2010 Published date: December 20, 2010

Health Problems and Nutritional Status of Selected Leprosy Victims of Burla Town, Orissa, India

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Abstract: An attempt has been made in this research article to assess the health and nutrition status of the leprosy victims of two leprosy colonies of Burla town, Orissa. Socio-economic, information of all the 150 victims residing in these two colonies were collected by the help of a pre tested interview schedule .The measurement of height and weight was recorded by stranded instruments. The weight and height of all the victims in the age group of 20 to 80 years were observed to be less than the weight and heights of reference Indian man and woman. Body Mass Index (BMI) revealed that all most all the victims suffered from moderate to severe grades of malnutrition. The socio-economic variables do not have much influence on the anthropometric measurements and prevalence of malnutrition. The study also aims to determine the information on various aspects of the disease and prevalence of various health problems among the leprosy victims.

Key word: BMI, health problems, leprosy, nutritional status

INTRODUCTION

Leprosy is highly stigmatized disease that apart from the physical ailments and the deformities causes, psycho-social-economic problem to the people affected (Kaur and Van, 2002). Leprosy is a major public health problem in most of the developing world and is often found in conditions connected with poverty, overcrowding, poor sanitation and insufficient nutrition (Lockwood, 2002; Yadav *et al*., 2007). Leprosy holds a unique position among communicable diseases because of the frequency of deformity, physical handicap and ostracism due to social stigma. This disease is highly stigmatized one and may lead to premature social death among patients. Once a person is correctly diagnosed as a leprosy patient, his/her roles in the family and society are restricted and constrained (Valencia, 1989). The World Health Organization estimates there are some 2-3 million people worldwide with significant disability due to leprosy (WHO, 2006).While considerable efforts have been made to reduce the development of disability in leprosy patients there are still a large number of cured leprosy patients with residual deformity. In India, for instance, it is estimated that there are 1 million individuals with disabilities attributable to past and present leprosy (WHO, 1995). The leprosy patients with deformity has unique socio-cultural problems. These include, among others, a lower acceptance in community (Kopparty *et al*., 1995; Diffey *et al*., 2000).

Leprosy is still a problem worldwide; although registered have fallen from 5.4 million worldwide in 1985 to less than 1 million in 1998, around 6, 85,000 new cases are recorded each year (Fine, 1994). At the beginning of 2009, the registered prevalence of leprosy globally was 2, 13,036. The number of new cases detected during the year 2008 as reported by 121 countries was 2, 49,007. Leprosy is also widely prevalent in India (WHO, 2009). India accounts for 65% of the global burden of leprosy. According to the NLEP progress report for the year ending March 2008-09, India reported 1, 34,000 cases of leprosy (Nath, 2009).Orissa is one of the state in which the leprosy situation is highly endemic. All most 1 in every 10,000 suffers from leprosy in Orissa (The Hindu, 2009). At present the prevalence rate of leprosy (Table 1, Deputy Director General (Lep.) 2009. Govt. of India) is above one per 10,000 populations in seven districts, which includes Bolangir, Jharsuguda, Angul, Bargarh, Sonepur, Kalahandi and Nuapada. In rest 23 districts rate of prevalence was below one per 10,000 populations The Hindu, 2009).

Along with many diseases, such as, malaria, tuberculosis and AIDS, leprosy continuous to be a serious challenge in most developing countries contributing significantly to the physical and social disability of the affected patients (Sinha, 2000). Nutrition also has a direct link with the ecology of the disease and the medical care system. Nutrition is a basic human need and a pre requisite for healthy life (National Institute of Nutrition, 2007).The effect of diet on the immune system can be the probable cause for the age and sex-wise variations in the incidence of the disease. Poor nutrition has also been suggested to affect a person's risk of

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Table 1: National leprosy elimination programme district wise annual new case detection and prevalence as on March 2009 of Orissa State

S.No.	Districts	Estimated population (March 2009)	New cases detected during 2008-09	ANCDR/100,000 (2008-09)	Prevalence end of March 2009	PR /10,000 as on March 2009
ORISSA						
1	Angu	l1281437	486	37.93	270	2.11
2	Balangir	1502354	454	30.22	265	1.76
3	Balasore	2275368	251	11.03	160	0.70
4	Baragarh	1513422	581	38.39	237	1.57
5	Bhadrak	1498404	152	10.14	81	0.54
6	Boudh	419563	135	32.18	88	2.10
7	Cuttack	2632613	286	10.86	151	0.57
8	Deogarh	308279	86	27.90	54	1.75
9	Dhenkana	l1198930	199	16.60	106	0.88
10	Gajapati	583108	46	7.89	29	0.50
11	Ganjam	3528169	323	9.15	166	0.47
12	Jagatsinghpur	1188327	87	7.32	51	0.43
13	Jajpur	1825269	213	11.67	119	0.65
14	Jharsuguda	572545	166	28.99	51	0.89
15	Kalahandi	1500792	236	15.73	143	0.95
16	Kendrapara	1464221	91	6.21	56	0.38
17	Keonjhar	1756271	195	11.10	124	0.71
18	Khurda	2108178	174	8.25	107	0.51
19	Koraput	1324866	159	12.00	97	0.73
20	Malkangiri	540125	37	6.85	15	0.28
21	Mayurbhanj	2498878	426	17.05	241	0.96
22	Nayagarh	971683	170	17.50	95	0.98
23	Nowrangpur	1145155	164	14.32	105	0.92
24	Nuapada	596690	193	32.35	102	1.71
25	Phulbani	728718	40	5.49	33	0.45
26	Puri	1685507	181	10.74	108	0.64
27	Rayagada	925664	43	4.65	26	0.28
28	Sambalpur	1044738	176	16.85	99	0.95
29	Sonepur	608089	250	41.11	155	2.55
30	Sundergarh	2057572	381	18.52	256	1.24
	Total = 30	41284936	6381	15.46	3590	0.87

leprosy infection although the relationship between nutrition and leprosy invasion is not known. (Sinha, 2000).In this backdrop the present survey was carried out to reveal the health problems and nutritional status of the leprosy victims living in two leprosy colonies.

MATERIALS AND METHODS

Field survey for this study was carried out during January to December 2009 in the most hyper endemic area of Burla in Sambalpur District of Orissa, India. In Burla N.A.C. area two leprosy colonies exists, namely Junapani (Established in 1956) and Laxmidunguri (Establish in 1975). The leprosy victims residing in these colonies constitutes the universe for the study. In this area VSS Medical College is the prominent hospital which provides both curative and preventive care to the leprosy victims. Hence persons affected by leprosy are predominately diagnosed and treated at the primary health care level. The data has been collected from the residents of the Junapani and Laxmidunguri Leprosy colonies where the victims after the treatment were mainly residing. Total 150 victims were residing in these colonies with 108 victims in Junapani (male 40 and female 47 and 42 victims in Laxmidunguri (male 22 and female 22). A pre-tested interview schedule has been used for the collection of information on general and family aspects by personal interview. Besides, information of the prevalence of various health problems among leprosy victims has been collected. The nutritional status of the victims have assessed by nutritional anthropometry. The measurements of weight, height, arm circumference, have taken by standard instruments (anthropometric rod, weighing machine, measuring tape). To measure the grade of malnutrition through the help of nutritional anthropometric the Body Mass Index (BMI) has been computed.

RESULTS AND DISCUSSION

Socio-economic profile: Description of the subjects by the demographic characteristics has been presented in Table 2. The study included 71(47.33%) males and 79 (52.67%) females. The subjects under the study belonged to the age group of 21-80. The majority of persons affected by leprosy are found in the age group between 51 to 60 years (30%). 47.3% of the victims belonged to the schedule caste group. Educational background of the victims is observed to be low as 82.0% of the respondents

Table 2: Socio-demographic profile of the leprosy victims

Particulars	No.	Percentage (%)
Age		
21-30	8	5.33
31-40	24	16.0
41-50	34	22.67
51-60	45	30.0
61-70	28	18.67
71-80	11	7.33
Total	150	100.0
Caste		
Schedule Caste	71	47.33
Schedule Tribe	21	14.0
Other Back Ward	54	36.0
General	4	2.67
Total	150	100.0
Sex		
Male	71	47.33
Female	79	52.67
Total	150	100.0
Educational qualification		
Literate	21	14.0
Illiterate	123	82.0
Up to 7th	3	2.0
High School	3	2.0
Total 150100.0		
Past occupation		
Business	2	1.33
Agriculture	50	33.33
Service	3	2.0
Household works	91	60.67
No work	4	2.67
Total	150	100.0
Present occupation		
Business	-	-
Agriculture	-	-
Service	-	-
Household works	3	2.0
Bagger	147	98.0
Total	150	100.0
Marital status		
Married	106	70.67
Unmarried	44	29.33
Total150100.0		
Type of family		
Joint family	18	12.0
Nuclear family	132	88.0
Total	150	100.0
Size of family		
One	42	28.0
Two	75	50.0
Three	16	10.67
Four	53	.33
Five & above	12	8.0
Total	150	100.0
Total yearly Income		
2001-3000	14	9.33
3001-4000	39	26.0
4001-5000	97	64.67
Total	150	100.0

are illiterate. Regarding the present occupation 98.0% of the victims are engaged in beggary. A total of 106(70.67%) subjects are married. It is found that 88% of victims belonged to nuclear families and 50% of victims were living in small sized families with two members only. On the whole, 64.67% of the respondents have a yearly income in the range of Rs. 4001/- to Rs. 5000/-

The detail information on the various aspects of the disease among leprosy victims has been presented in Fig. 1 (a-f). It is found that in 48.0% of cases the disease was first detected or reported by the health workers during survey. Remaining 5.33, 6.0, 27.34 and 33.33% was first detected by the person themselves, through friend, through relatives, through doctors respectively. 47.3% of patients got the treatment in Bargarh Government Hospital. In 57.3% of cases the duration of treatment is between 6 to 10 years and the rest 54% of the patients suffered from leprosy for a period of 21-40 years. The first diagnosis of the disease was done when the patients are in age group of below 30 years. 42.0% of the victims suffered from the deformities. The prevalence of various health problems among leprosy victims has been presented in Fig. 2 (a-d). The study revealed that 39.33% of patients suffered from Rheumatism 31.31% victims are suffering from digestive problems, 43.3% of the victims have eye problem. Most of the victims faced dental problems.

The detail of anthropometric measurements among the leprosy victims has been presented in Table 3. The average weight of the male victims is in the range of 44-49 kg, where as in case of female leprosy victims it is in between 36-43 kg., which were observed to be lower than the weight of Indian reference man and woman. The lowest average weight observed is 44.75 and 36.50 kg in male and female respectively in the age group 21-30. The average height of the male victims is in the range of 153-165 cm, where as in female victims it has been recorded to be 141-150 cm. The lowest average height was observed to be 153.50 and 141.25 cm in male and female respectively in the age group 21-30. The average chest circumstance of the male victims is recorded to be in the range of 30-33 cm. whereas in female victims it is 30-32 cm. The lowest average chest circumstance observed to be 30.75 cm in the age group 21-30 and that of female it was 30.02 cm in the age group 71-80. The average mid-arm circumstance of the male victims has been recorded in the range of 7.5-9.5 cm, where as in female victims it is 8-9 cm. The lowest average mid-arm has been observed to be 7.5 cm in the age group 71-80 and that of female has been 8 cm in the age group 21-30.

The prevalence of various grades of malnutrition on the basis of BMI (Body Mass Index) in relation to age and sex group of the leprosy victims has been presented in Table 4. All most all the leprosy victims are suffering from either moderate or severe forms of malnutrition on the basis of BMI.100% of male victims in the age group of 21-30, 41-50, 71-80 are suffering from severe

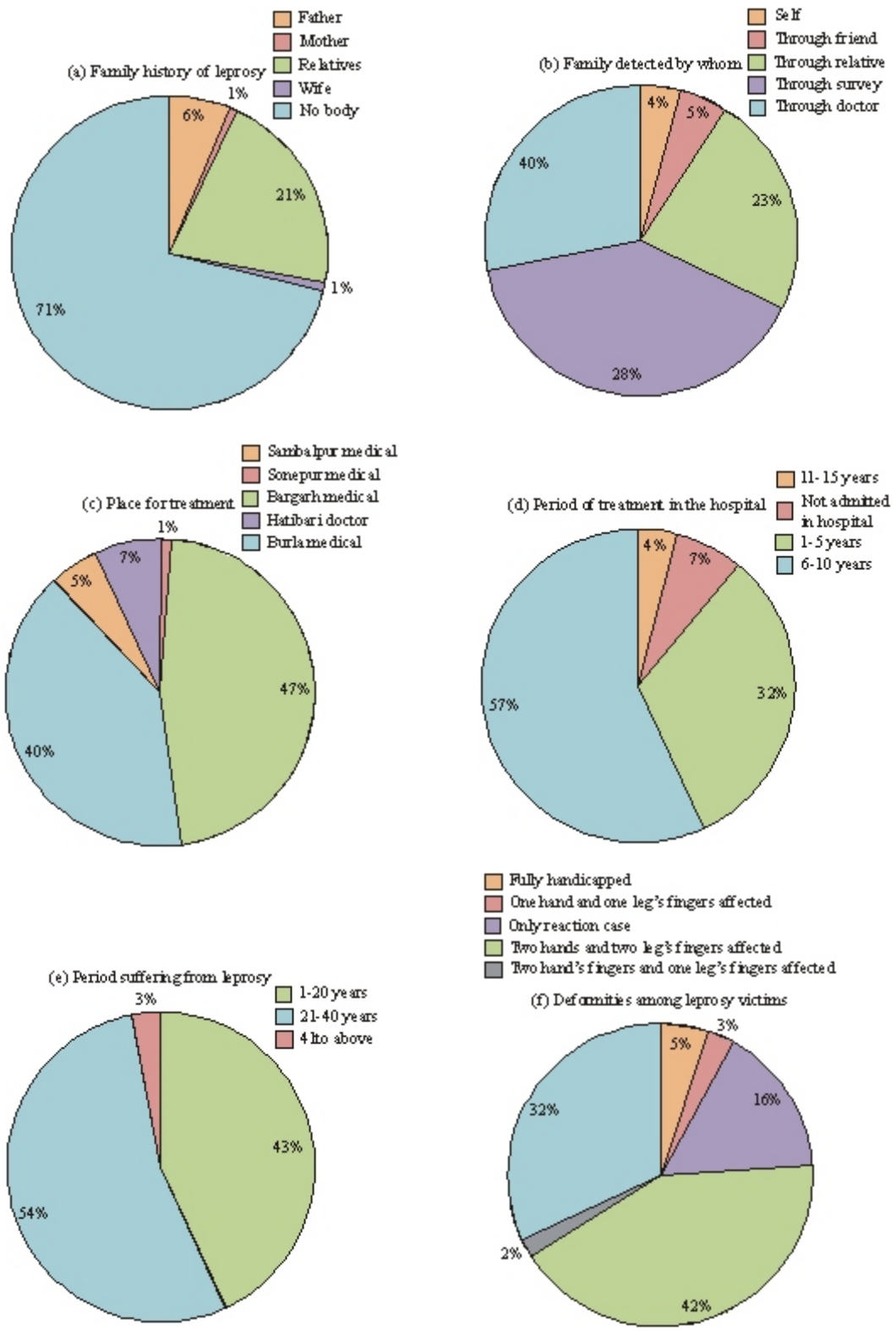

Fig. 1: Information on the various aspects of the disease (Leporsy)

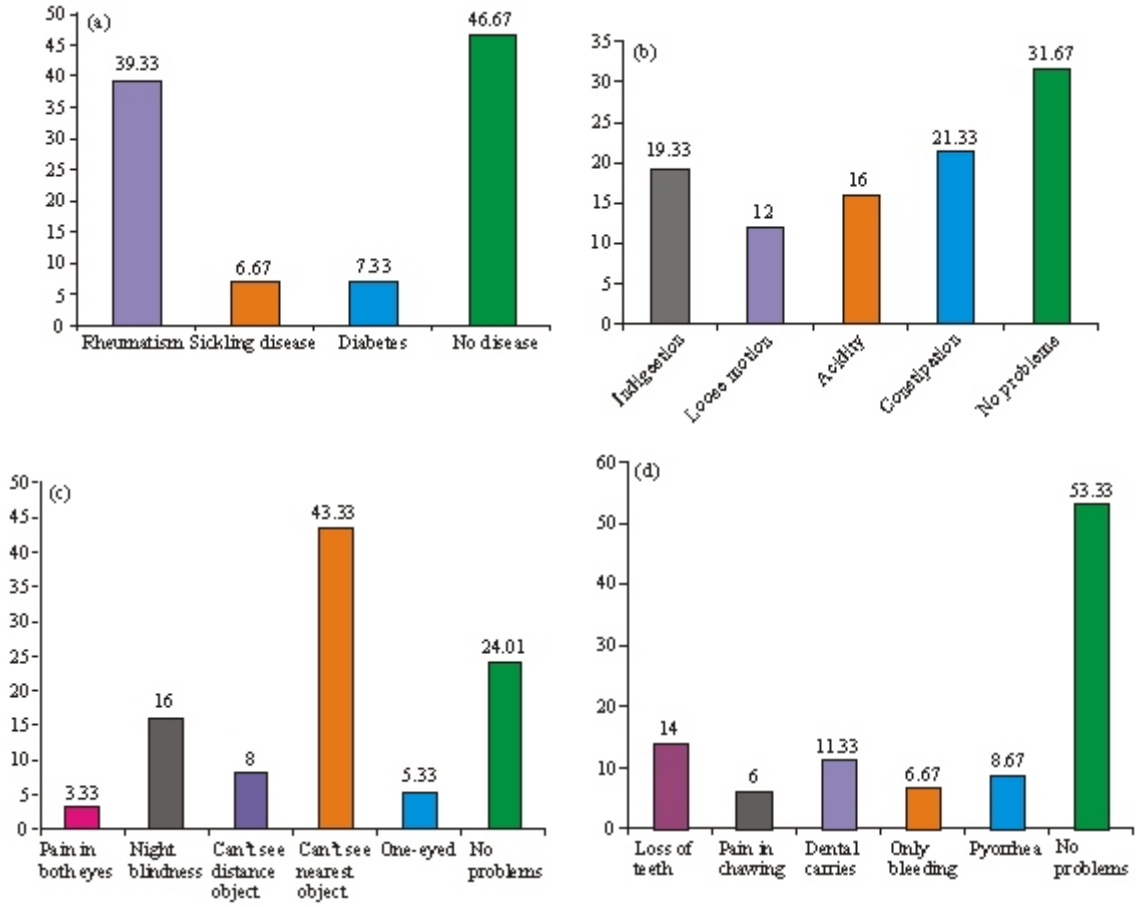

Fig. 2: Prevelance of various health problems among the leprosy victims

Table 3: Anthropometric measurements of the respondents (Mean and Standard Deviation)

Age group	Sex group	No.	Mean and Standard Deviation	Weight in Kg	Height in cm.	Chest in cm.	Mid-arm c. in cm.
21-30	Male	4	Mean	44.75	153.50	30.75	9.25
			SD	3.77	7.18	1.25	0.28
	Female	4	Mean	36.00	141.25	31.00	8.00
			SD	7.04	2.70	2.04	0.91
31-40	Male	9	Mean	45.55	159.77	30.88	8.00
			SD	8.45	6.07	1.63	0.91
	Female1	5	Mean	42.46	149.80	32.06	9.22
			SD	10.46	8.90	5.28	0.61
41-50	Male1	3	Mean	47.07	159.61	32.66	9.38
			SD	7.65	7.24	2.04	1.00
	Female	21	Mean	43.00	150.23	32.11	9.16
			SD	9.07	7.27	3.47	1.01
51-60	Male	23	Mean	45.60	160.24	32.91	9.36
			SD	9.24	8.27	2.13	0.88
	Female	22	Mean	41.18	149.18	31.00	8.93
			SD	8.49	3.97	3.38	1.17
61-70	Male	21	Mean	49.42	159.33	33.42	9.50
			SD	6.88	9.28	3.06	0.75
	Female	7	Mean	38.71	149.85	30.71	8.14
			SD	8.28	5.42	2.43	0.89
71-80	Male	1	Mean	46.00	165.00	31.00	7.50
			SD	-	-	-	-
	Female	10	Mean	38.10	147.00	30.0	28.40
			SD	9.31	5.47	2.54	0.93

Table 4: Prevalence of various grades of malnutrition on the basis of bmi in relation to age and sex group of the respondents

			Body Mass Index (BMI)		
Age group	Sex group	No.	Normal	Moderate malnutrition	Severe malnutrition
21-30	Male	4	-	-	4 (100.0%)
	Female	4	-	-	4 (100.0%)
31-40	Male	9	-	1 (11.11%)	8 (88.89%)
	Female	15	-	3 (20%)	12 (80%)
41-50	Male	13	-	-	13 (100.0%)
	Female	21	-	1 (4.76%)	20 (95.24%)
51-60	Male	23	1 (4.35%)	3 (13.04%)	19 (82.61%)
	Female	22	1 (4.55%)	1 (4.55%)	20 (90.90%)
61-70	Male	21	-	2 (9.52%)	19 (90.48%)
	Female	7	-	2 (28.57%)	5 (71.43%)
71-80	Male	1	-	-	1 (100.0%)
	Female	10	-	1 (10%)	9 (90%)

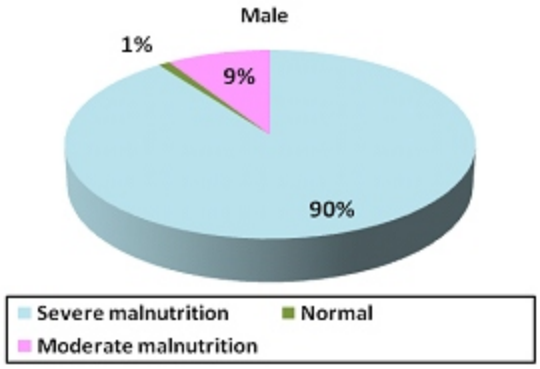

Fig. 3: Prevalence of various grades of malnutrition amnog the male victims on the basis of bmi

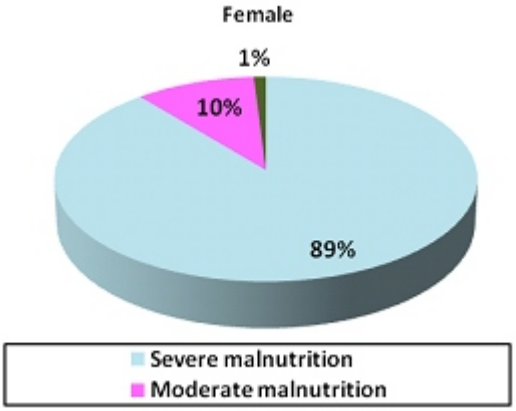

Fig. 4: Prevalence of various grades of malnutrition amnog the female victims on the basis of bmi

malnutrition and 100% of female victims in the age group of 21-30 (younger age group) are suffering from severe malnutrition. 80-90% of female victims in other age groups are also suffering from severe malnutrition. 11.11, 13.04, 9.52% of the male victims' in the age group of 31-40, 51-60 and 61-70, respectively are suffering from moderate malnutrition and 20, 4.7, 4.55, 28.57, 10% of female victims in the age group of 31-40, 41-50, 51-60, 61-70 and 71-80, respectively are suffering from moderate malnutrition. Only 4.35% of male and 4.55% of female victims in the age group of 51-60 is observed to be normal.

The prevalence of malnutrition among the leprosy victims in total has been presented in Fig. 3 and 4. Only 1.41% male and 1.25% female victims are observed to be in normal category, 8.45% male and 10.15% female were suffering from moderate malnutrition and rest 90.14% male and 88.60% were suffering from severe malnutrition. No subjects were found to be obese. Hence the prevalence of severe malnutrition is observed to be higher among the victims.

The findings of this study revealed that more number of the victims were in the age group of 51-60 years (30.0%). Leprosy is not particularly a disease of any one of the age group. Infection can take place at any time depending upon the opportunities of exposure. It has been found that the incidence and prevalence of leprosy appear to be higher in males than in females in most regions of the world. The excess number of cases in males has sometimes been attributed to their greater mobility and increased opportunities for contact in many populations. Although men and women were both affected in terms of their social life, women suffered more isolation and rejection from family and society. The issue is of considerable significance for women, who are accorded a low social status in many communities in India and receive differential treatment from the member in the family and the wider society. Thus the understanding of the gender differentials in the social and family life of leprosy patients is important. The differences in impact of the disease on their social life between male and female were statistically significant. It is apparent from Table 2 that largest numbers (47.33%) of total cases belong to the schedule caste community. The large number of relapse cases in SC community may be due to their negligence towards leprosy treatment. All these seem to indicate that

socio-economic conditions including literacy, Income, living standards and occupation may have a significant role to play in the occurrence of the disease. The fact that the disease does occur even amongst higher castes, although with lesser frequency seems to strengthen this assumption, so the relationship of the disease with ethnic group seems to operate more through the socio-economic factors. On the basis of literacy, it becomes evident that the victims of the disease were mostly illiterate as indicated in the Table 2. From the total cases traced during survey 14.0% were literate, while 82.0%were illiterate. Remaining 2% were studied up to 7th class and another 2% were studied up to high school level. The higher % of illiterate patients affected indicates the possibility of contracting infection from various factors due to ignorance and under reporting from the illiterate parents. In literate case just the reverse is found, i.e., the possibility of getting this disease is less among literates while it is high among illiterates. Thus, it may be said that illiteracy could be a major factor which is causing hindrance in imparting health education among the communities. Classification of past profession/occupation with respect to disease give an idea of the association of the disease with particular type of profession which in true can be associated with physical factors influencing the incidence of the disease. Table 2 revealed that agricultural labour had the highest number (33.33%) of cases, besides this 60.67% of cases are found among housewives who share dual responsibility at home as well as at their work place (agricultural field). It is amply clear that with 33.33% of the affected persons being associated with agriculture. The leprosy bacilli are known to survive in moist soil for 46 days and the association of the disease with certain soil zones. So there is a strong possibility that occupation involving tilling of the soil has a major role to play in occurrence of the disease .The fact that the housewife is the 4th largest category of patients constituting 52.67% of the total, indicates that close physical contact with their male partners makes them vulnerable to the disease. These, together with the duties they share in the field with their male folk, make them a high group. Regarding the present occupation (Table 2) 98.0% of the victims were engaged in beggary. Anesthesia of the limbs due to leprosy and the trauma caused due to physical labour resulted in deformities. Because of the disabilities, they were no longer able to carry out their previous occupations. Due to lack of opportunities and restricted physical ability they opted for beggary continuing for years they adopted begging as an alternate vocation. Despite this, we found that 80% reported to be ready to quit begging, if given a change to start a fresh. The need is to redirect energy to words productive living. On the basis of marital status 70.67% patients were married and rest of 29.33% were unmarried. Family income also plays a major role in order to judge the socio-economic status. The living standard generally depends upon the family income. Table 2 revealed that the highest number (97%) of cases has income of below Rs 5000/- per year/annum. It is evident that 97 % of leprosy patients belong to the economic category which is below the poverty line. So the relationship between economic status and leprosy is very apparent. Family size is also plays a vital role in a family. Around 50% patients were living with two family members. From the Table 2, it was found that out of 150 cases 88.0% of cases are found in nuclear family and remaining 12.0% of families have joint family. This suggests that occurrence of leprosy cases does not depend upon the types of family. Therefore, it is necessary to investigate the infectivity of the patients in the family rather than whether the family is nuclear or joint.

There is limited literature on the links between leprosy and nutrition. One segment of literature is devoted to the possible role that under-nutrition plays in the genesis of leprosy, possibly by compromising immune function (Foster *et al*., 1988). A second segment explores the consequence of leprosy with regard to nutritional status in the index case (Oh *et al*., 1998)and the family (Saha *et al*., 1990, Chattopadhya *et al*., 1992; Duncan, 1980). A third segment explores the literature is devoted to the effect of leprosy induced deformity on the nutritional status of index cases and their household members (Diffey *et al*., 2000). Unfortunately, no recent data about health and nutritional status of the leprosy patients measured on the basis of anthropometric measurement and prevalence of various grades of malnutrition with BMI in different age and sex groups in Orissa, is available. Therefore, this study made a humble attempt to study the health and nutritional status of the leprosy patient and also revealed the impact the socio-economic life of the leprosy victims on their health problems and nutritional status.

CONCLUSION

In summary, we concluded that leprosy victims are at increased risk of under nutrition. This information will be useful in evolving strategies for identifying most ‘vulnerable households’ that require urgent nutritional rehabilitation in the short term and vocational rehabilitation with a view towards long term self sufficiency. Although this data has been generated with leprosy victims who face unique socio-cultural pressures, it provides an initial basis for understanding the potential links between physical disability and nutritional status. It has indicating the requirement of immediate appropriate public health nutritional intervention programmes.

ACKNOWLEDGMENT

The authors acknowledge the facilities provided by the Department of Home Science, Sambalpur University, Orissa for carrying out the research work.

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