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Malaria: The assessment of knowledge, perception with respect to social and cultural context of a tribal community of western Odisha and barriers in seeking treatment

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Abstract
Since the dawn of civilization the mankind has been affected by various diseases and pestilence. Malaria had been a major concern all the time world over as it eluded treatment for a long time and during Second World War too it took thousands of life. The disease has been endemic to the equatorial and the tropical areas and ran in fatal proportion before the malaria parasite was discovered by Sir Ronal Ross, a colonial doctor in India, inside the intestine of female anopheles mosquito. Consequently, Quinine was invented and a measure breakthrough was reached. Despite decades of great control and prevention efforts, Malaria still remains a major global public health problem affecting all ages. It remains one of the leading causes of morbidity and mortality in the developing world. Two strains of malaria parasite has been the cause of malaria – *Plasmodium vivax* and *Plasmodium falciparum*. Whereas the first one is responsible for common malaria, the other causes cerebral malaria. Malaria is a major problem of the tribal areas of India. 50 percent of all malaria cases, 70 percent of all cerebral malaria (*Plasmodium falciparum*) cases and 90 percent of all malaria deaths occur in tribal areas. The high incidence of malaria in tribal areas is due to a variety of factors. The present study was undertaken with the aim to assess the knowledge and perceptions regarding malaria; it further tries to investigate the treatment seeking behaviour and exploring factors involved in the selection of different treatment options in the studied population. Data have been collected by using different qualitative methods like observation, focus group discussion and also questionnaire based household surveys to household heads, in-depth interviews to key informants were carried out independently. This paper presents the results of a study into community perceptions and practice relating to causation, treatment and prevention of malaria in Oraons community of a village of Western Odisha. The Oraons of the studied area are aware of malaria fever and actively seeking medical help from available sources of treatment, however they are poorly informed of dangerous falciparum malaria and process of the disease transmissions through infected mosquitoes. They have less access to the government health facility. Further social and cultural beliefs and practices play crucial roles among tribal people as barriers and stimulants to accept and reject modern health care services and other health facilities. Thus the improved health services in terms of availability, quality and accessibility and effective information and communication regarding diseases and services can go a long way in tackling the problem.

Keywords: knowledge, perception, traditional healer, self-medication, primary health centre, treatment seeking behaviour, insecticide treated mosquito nets (ITNs), indoor residual spray (IRS)

Introduction

Malaria is ranked as the leading communicable disease and it had been a major concern all the time world over as it eluded treatment for a long time. It had been a major cause of morbidity and mortality in tropical and subtropical regions of the world. Despite decades of considerable efforts to combat malaria, it is still the most prevalent and most devastating disease affecting all ages which impedes social and economic development, in spite of being both completely preventable and treatable. As it is a preventable and treatable mosquito borne disease.

Malaria remains a serious illness, approximately 300-500 million cases of illness and more than one million deaths occur each year globally. Malaria not only poses a high risk to health, but the repeated clinical consequences of infection in endemic areas place a burden on households, on the health services and ultimately on the economic growth of communities and so also the nation. Socioeconomic conditions of the community have direct bearing on the problem of malaria. It is a major problem of the tribal areas of India. 50 percent of all malaria cases, 70 percent of all cerebral malaria (*Plasmodium falciparum*) cases and 90 percent of all malaria deaths occur in tribal areas. The high incidence of malaria in tribal areas is due to a variety of factors. Inappropriate treatment seeking behaviour and self-treatment prior to visiting health facilities were the main cause of progressing of disease and death. The community should be aware of the importance of seeking early diagnosis and treatment because prompt and effective treatment will prevent most cases of uncomplicated malaria and also important for controlling the transmission of malaria. Further early diagnosis and treatment are part of effective disease management that should be happen within 24 hours after the onset of symptoms. The symptoms of malaria can be non-specific but fever is its cardinal symptom. The fever is often accompanied by headache, chills, rigors, anorexia, nausea, vomiting, etc. The facility of sincere and effective treatment is the cornerstone of malaria case management and in reducing severe morbidity and mortality from the disease.

People's perceptions and their coping strategies were not taken into account while planning and implementing the eradication and control programme. It is widely

acknowledged that an understanding of socio-cultural and ecological contexts of malaria transmission is crucial to the success of all efforts to control malaria. Malaria control requires an integrated approach comprising prevention and treatment with effective anti-malarial agents while the programmes for malaria control must be related to knowledge and belief of the people and considered the broad, complex and interrelated factors that influence human behaviour. Hence, understanding the local perceptions, people's knowledge, attitudes and its influence on health seeking behaviour from the community's point of view is critical and relevant to the development of health education messages that increase community awareness of the problem as well as the importance of early diagnosis and prompt treatment of malaria to establish epidemiological and behavioural baselines to identify indicators for monitoring programmes.

The findings of this study may help in understanding the population and ensuring that it could provide baseline information to design effective and sustainable malaria control strategies suited to local conditions in the near future.

Overview of Literature

Karunamoorthi K. and Abdi K. (2010) [12] studied on a group of adults where majority of the participants demonstrated general awareness but did not know the real cause of malaria. Some sorts of misconceptions were also included as major findings. Snow *et al.* (2005) [20] provided an empirical approach to estimate the number of clinical events caused by *Plasmodium falciparum* worldwide, by using a combination of epidemiological, geographical and demographic data. A study was carried out by Vijayakumar *et al.*(2009) [22] in two districts viz., Malkangiri and Koraput of Orissa state in India to know people's knowledge, attitude and practice on malaria and its prevention. The findings of the study showed that people from remote villages seek treatment from traditional healers, Disharis. About 64% of the respondents stated that avoiding mosquito bites could prevent malaria. Majority (99%) of the people reported using personal protection measures to avoid mosquito bites. Although, majority of the people were aware of the cause and prevention of malaria (about 70% stated sleeping under mosquito net prevents malaria), a sizable proportion still had misconceptions and hence appropriate communication strategies should be developed. Comoro *et al.* (2003) [5] have outlined the order of preference for seeking treatment for malaria. Traditional healers were seen as the primary source of treatment outside homes for this condition and grandmothers and mother in-laws are the key decision makers in the management. Further the findings revealed major gaps in managing severe malaria in the study communities. Interventions addressing these gaps and targeting mothers/guardians, mother in-laws, grandmothers and traditional healers are needed. Kinung'hi *et al.* (2010) [13] in their study find that Community knowledge, attitudes and practices are important in enhancing disease control interventions. This study further investigated determinants of malaria epidemics in Muleba district in North-western Tanzania in relation to household knowledge, attitudes and practice on malaria. Tarimo *et al.* (2000) [21] pointed out the mothers' perceptions and knowledge on childhood malaria. They assessed mothers' abilities to recognize non severe and severe/complicated malaria in children when a child has fever with other physiological and behavioural symptoms associated with malaria. The study of Yadav S.P *et al.* (2005) [24] aims to determine social determinants of malaria as applicable to existing caste groups of desert part of Rajasthan. They have the opinion that existing status of knowledge among the population could lead to a substantial control over in-migration as well as further transmission of disease in the desert part of Rajasthan. Sharma (2008) [17] described the treatment-seeking behaviour and the log-normal distribution of care-seeking time - the number of days from the onset of symptoms of malaria to when a patient seeks treatment from a provider. One major finding of the study was that the care-seeking rate or the probability of seeking care was low on the first day of the symptoms; it increased sharply over the first five days and then gradually declined.

Objectives

Against the backdrop, the study has the following objectives:

1. To assess the knowledge and perceptions regarding malaria among the sample respondents; and
2. To investigate the treatment seeking behaviour and exploring factors involved in the selection of different treatment options in the studied population.

Methodology

The study was carried out among Oraon community in Jujomura block of Sambalpur district of Western Odisha. The block is about 40km distance from the district Head Quarter. The district of Sambalpur is an ancient centre of diamond trade, famous for its tie and dye textiles; folk dance and music; and also famous for the Hirakud Dam, one of the longest main stream dams in the world.

Among the 9 blocks of the district, Jujomura is selected for research purpose among the Oraon people. Oraons are one of the major tribes in the country. In Odisha they are found in the district of Sundergarh and Sambalpur. In Sambalpur where the study was conducted the Oraons have their highest concentration in comparison to the other tribes. Five villages namely; Barangamal, Nua Barangamal, P. Badmal, Khairmal and Thakurmal of Nuabarangamal Panchayat of Jujomura block were selected for data collection; these are situated on the eastern part of Sambalpur district. The Oraons constitute 87 households with a population of 439 (out of which 120 are our sample respondents) and i.e. 67.33% of the total population of the sample villages. The main occupation of the people is farming and some are working as daily wage labourer, bidi makers and they also collect many kinds of forest species.

The month of May is the hottest month in the year with the average of maximum temperature of 43.2°C and December and January is the coldest month with the minimum temperature recorded as approximately 9.6°C. Monsoon comes in this area in the middle of June. Average annual rainfall is 1413.5 mm.

Prevalence of *Plasmodium falciparum* is significantly higher in the wet season than in the dry season. The villages do not have any modern medical facility. There are three primary health centres in different places of Jujomura block. But these lack modern equipments and proper medicines. The people of the selected villages particularly the Oraons people prefer the modern medical facilities to some extent, because their traditional medicine is still persisting in their community.

Study design

The study was cross-sectional, descriptive and community based. Household is the sampling unit of the study. List of the households in each village was prepared through census method. One third of the total households from each village were selected by using systematic random sampling for the household survey. A total number of **120** respondents were selected randomly and the male or female head of each of the selected households was interviewed. In the absence of the household head an adult member of the household was interviewed using interview schedule.

Instruments and Data collection methods

Data required for the study were gathered using both qualitative and quantitative methods. Qualitative data were collected through observation, in-depth interview and focus group discussion. Quantitative types of data were collected through household survey using interview schedule and structure questionnaire covering treatment seeking behaviour and associated factors like socio demographic variables, malaria related variables, perceived susceptibility for malaria, perceived severity of malaria and attitude toward health institution service was adopted using health belief model as a guide by reviewing different literatures that were pertinent to the topic.

To ensure reliability and validity of the data, a pre testing of the questionnaire was carried out with 5% of the sample size with prior to actual data collection with similar subject and amendments were made accordingly.

Results

Socio-demographic characteristics of the respondents

The sample respondents were between 25-65^{+} years of age. Man represented 61.66% and women 38.33%. The literacy rate was 28.33%. Only 9.16 % had attend high school and above. This depicts poor education level in the study population. The marital status of the population was very high. Most (65.83%) of the respondents were married. They employed themselves as farmers *(parajas)* (47.5%), bidi makers (27.5%), wage labourer (14.16%), business man (7.5%), etc. *(Table-1).*

Table 1: Socio-demographic characteristics of the study population

Characteristics	Frequency (n=120)	Percentage (%)
Gender		
Male	74	61.66
Female	46	38.33
Age		
25-34	32	26.66
35-44	28	23.33
45-54	40	33.33
55-64	13	2.5
65+	7	5.83
Educational Level		
Literate	34	28.33
- Primary	23	19.16
- Secondary	11	9.16
Illiterate	86	71.66
Marital Status		
Married	79	65.83
Single	27	22.5
Divorced	5	4.16
Widow	9	7.5
Occupational Status		
Farming	57	47.5
Bidi maker	33	27.5
Wage labour	17	14.16
Business	9	7.5
Unemployed	4	3.33

Malaria illness concept

The majority of the respondents considered fever to be "jar" (*nadi andralu*) in their local dialect. They explained jar as a raised body temperature (hot body) compare to a normal body temperature. They confirmed the presence of fever by touching the body of the febrile person. They classified fever to be low, moderate and high, based on past experience. Malaria was considered to be a type of classification of jar which was defined as *fever with shivering* or *fever on alternate days* by the respondents.

Knowledge and perception about causes and transmission of malaria

The respondents were much aware of malaria transmission, cause and mosquito breeding sites *(Table-2).* Out of the sample participants the majority of respondents (80.83%) were aware about the cause (mosquito bite) of malaria irrespective of sex, age and occupation. During the survey many of the respondents knew that mosquitoes are transmitting the malaria. A total of (75.83%) people knew that stagnant water bodies are serving as mosquitoes breeding

sites. Other reported causes were eating of oily (*isung*) food (16.66%), eating of sugary (*chaiani*) food (11.66%), eating raw vegetables *(aadha Aami)* (7.5%), drinking dirty water *(aammu)* (35%), heat from the sun (23.33%), chill climate (19.16%), malnutrition (44.16%) and other causes like genetic inheritance (5.83%).

So far as malaria transmission is concerned the members of the community knew that malaria could be transmitted from one person to another person through the bite of infected mosquitoes. About (10%) of the respondents had no any idea how malaria is spread in their community. Some believed that mosquito coming from dirty places (51.66%) may transmit malaria in human population, while some other respondents believed that mosquito can bring malaria from pigs *(kissu)* and ducks *(gende)* to human beings (31.66%). Some believed that poisons mosquitoes coming from jungle can spread malaria in community (44.16%).

Table 2: Respondents knowledge and perception about causes, transmission of malaria and mosquitoes breeding sites

Variables	Frequency	Percentage (%)
Awareness about malaria		
Yes	106	88.33
No	14	11.66
Perceived causes of malaria		
Mosquito bites	97	80.83
Hot weather	28	23.33
Chill climate	23	19.16
Wet in rain, dew and season change	36	30
Eating of Oily foods	20	16.66
Eating of Sugary foods	14	11.66
Eating raw vegetables	9	7.5
Drinking dirty water	42	35
Dirty environment	69	57.5
Not spraying insecticide	71	59.16
Malnutrition	53	44.16
Genetic Inheritance	7	5.83
Evil spirit	27	22.5
Witchcrafts	44	36.66
Malaria Transmission		
Infected mosquito coming from patients	47	39.16
Mosquito coming from dirty places	62	51.66
Mosquito that has bitten pigs and ducks	38	31.66
Poisonous mosquito from jungle	53	44.16
Dirty stagnant water/ swamp	91	75.83
Cold water	74	61.66
Starvation	26	21.66
No idea	12	10
Mosquitoes breeding sites		
Stagnant water	91	75.83
Waste/ Polluted water	67	55.83
Dirty places/ Dustbin	62	51.66
Tree holes	39	32.5
No idea	12	10

Perceptions about signs and symptoms of malaria

The respondents were aware of signs and symptoms of malaria. They indicated awareness of common signs and symptoms in both adult and children, as shown in *Table-3*. The most frequently mentioned sign and symptoms of malaria included hot body/ fever (77.5%), intermittent fever (42.5%), spasmodic fever (40.83%), head ache (63.33%), chill (77.5%), shivering (77.5%) and vomiting (70%). However some respondents also mentioned yellowish urine (47.5%), restlessness (35), loss of appetite (55.33%), etc. as symptoms of malaria.

The fever was described by some of the informants as so intense that initially you could feel chilling cold and your whole body begins to shiver and then you could feel the heat coming out from mouth, eyes and ears. Chills and high fever usually and with profuse sweating, so excessive that one must put off and squeeze clothes. Pain in joints (66.33%), in lower legs was also described as symptoms of malaria. Chills and shivering fever on alternate day were key to recognize malaria fever as reported by the sample respondents.

Table 3: Respondents perceptions about signs and symptoms of malaria

Signs and Symptoms	Frequency	Percentage (%)
Fever/ Hot body	93	77.5
Head ache	76	63.33
Back ache	76	63.33
Intermittent Fever	51	42.5
Spasmodic Fever	49	40.83
Joint Pain	76	63.33
Chill	93	77.5
Shivering	93	77.5
Vomiting	84	70
Yellowish Urine	57	47.5
Restlessness	42	35
Loss of appetite	64	53.33
Rigors	38	31.66

Sources of information about malaria

The sample respondents gave a wide range of sources of information about malaria *(Figure-1)*. Health workers of village Anganwadi Centre were their major source; they also gathered information from the elderly members of the community and third was radio followed by television. Very little information about malaria originated from friends or newspaper.

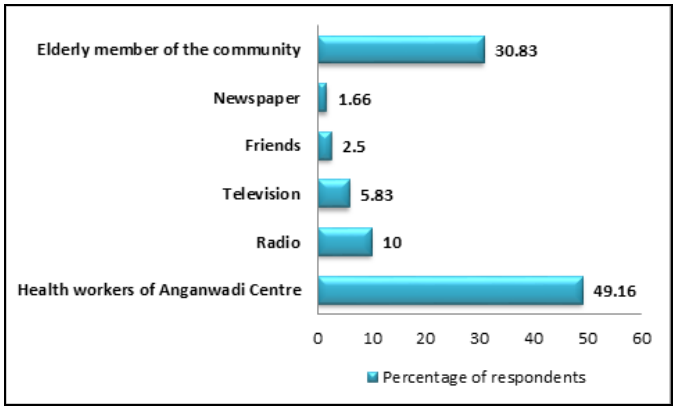

Fig 1: Sources of Information about malaria related information as reported by respondents

Pattern of treatment seeking behaviour and measures taken for malaria prevention and control

Regarding treatment seeking for malaria the respondents stated that they resort to managing mild and severe malaria at home by using both *traditional* and *modern* methods *(Figure-*

2). Anti-malarial drugs were provided free of cost at Primary health centre. But diagnostic facilities are not available in most of the peripheral health facilities. That's why majority of the respondents don't seek treatment from government facilities. Hence their traditional medicine is still persisting in their community. Treatment modalities for managing malaria included home remedy (use of locally available *herbs, roots, barks* and *leaves* by individual or family) and self-medication using anti-malarial drugs such as *chloroquine* and *paracetamol* as the first line of action.

Herbal medicine used by the Oraons for malaria:

Local Name: Bhui Neem
Botanical Name: *Andrographis Paniculata*
Part used: Leaf *(Aatha/ Patal)*/ Whole plant
Mode of administration: Whole plant is grinded with water and tablet is prepared with sugar
Doses: Three tablets twice daily before taking meal

Some respondents however indicated that they resort to another treatment choice outside the home when the first action at home fails. At that time they prefer to seek treatment from a health facility because of treatment effectiveness but considered this costly and inconvenient as compare to traditional healers, self-use of herbs or purchasing of drugs from local pharmacy for self-medication.

Traditional healers are immediate source for treatment of any illness in the community. Use of traditional healers is significantly higher as compare to the other sources of treatment. They reported that as per their traditional and cultural practices, they consult the traditional healer (85%) in almost all types of illness including malaria fever to conform whether *bhuttu* (evil spirits) are implicated illness. If the healers do not see any role of evil spirits and patients present the symptoms of malaria fever they refer their patients to Govt. medical facilities.

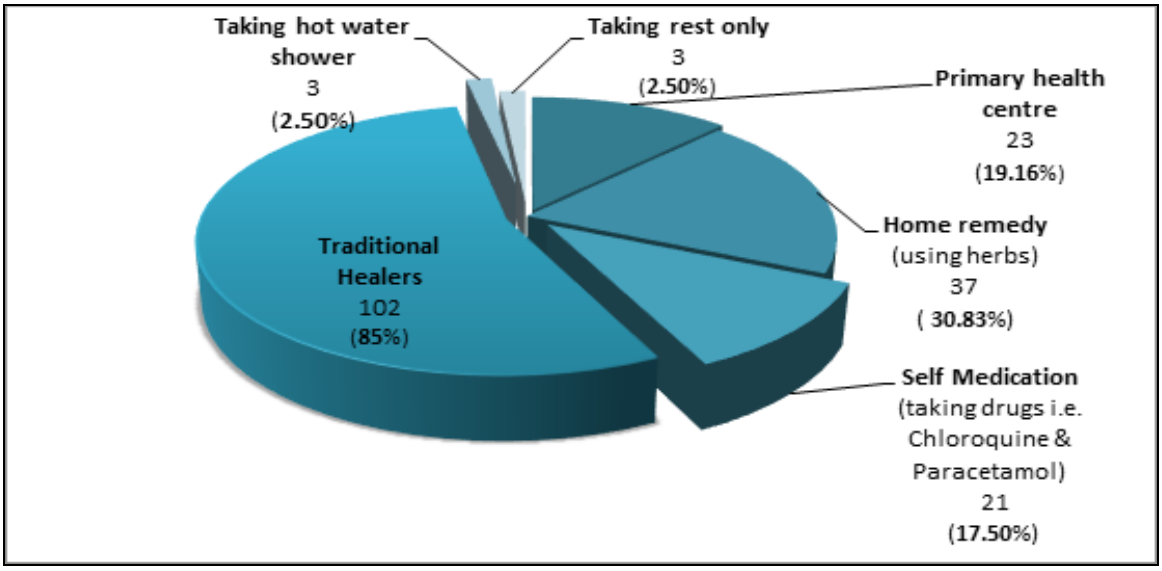

Fig 2: Order of preference regarding seeking treatment for febrile disease as reported by respondents

Certain foods preferred and avoided during malaria: Majority of the sample respondents restricted dietary intake of the febrile person during illness and most of the family avoided to give fried foods (*anat*), milk, etc. to the person affected with malaria but at the same time they prepared to give *Sabudana* (local preparation made by adding water), Khichddi -a semi-liquid preparation from the mixture of rice (*mandi/ tinhal*) and barley to the febrile person.

So far as the preventive measures are concerned the vast majority of respondents believe that malaria is preventable (69.16 %). But only 5.83% stated that they use insecticide-treated mosquito nets to protect themselves against malaria. The reasons given by those who did not own or use a bed net at the time of the survey were due to cost (56.66%) and/ or discomfort due to heat (37.5%). Some have stated that they got indoor house sprayed of DDT, but only (10.83%) were sprayed with in the last six month that were effective in protecting from mosquitoes. But they have strong believe that regular deployment of bed nets and DDT indoor residual spray (IRS) could prevent malaria (Table-4).

Table 4: Preventive measures taken by the Sample Respondents

Types of prevention measures			Frequency	Percentage (%)
Insecticide-treated mosquito net	Used		7	5.83
	Not used	Due to cost	68	56.66
		Discomfort due to heat	45	37.5
Indoor house sprayed of DDT	Used (within last six months)		13	10.83
	Not used		107	89.16
Traditional Medicines	Used (during rainy season)		21	17.5
	Not used		99	82.5

Factors associated with the treatment seeking behaviour of the respondents

When factors associated with the treatment seeking behaviour adjusted for their confounding factors, only attitude of the respondents toward health facility services, perceived susceptibility for malaria and knowledge that mosquito nets can prevent from mosquito bites were independently associated as strong predictors with treatment seeking behaviour of the respondents.

Discussion

The study sheds light on a group of people of different villages of Jujomura block of Sambalpur district of the state Odisha regarding the level of understanding community knowledge about malaria and treatment seeking behaviour. Community knowledge, attitudes and practices relating to causation, transmission, prevention and treatment are key factors influencing malaria prevention and control. These factors are becoming more important in designing and improving malaria control activities to help establish epidemiological and behavioural baselines to identify indicator for monitoring programmes.

It definitely provides information for educators and policy makers that are necessary for guidance towards malaria preventive campaigns. The collected information is relevant to understand people's perceptions of malaria and its implication for health seeking behaviour and malaria control. Understanding community perception about malaria and the underlying intervention for its management has a policy implication for mounting successful prevention and control initiatives.

In the context of the present study, the data provided an accurate picture of the knowledge, perceptions and treatment seeking behaviour and factors associated with treatment seeking behaviour of the study population.

The respondents had satisfactory knowledge regarding the aetiology, symptoms and treatment of malaria. The majority correctly understood that malaria is transmitted by mosquitoes. The present study further revealed that significant number of respondents believed that malaria was caused by drinking dirty water, unhygienic condition in and around their houses and the changing environment.

With respect to the causes of malaria, almost all respondents of the community implicated mosquito bite as a possible cause of malaria. but at the same time they include the cause of malaria to multiple factors, such as; hot weather, season change, dirty environment and living nearby forest. It was also perceived to be caused due to drinking contaminated water and bathing with dirty water. There was a misconception in this study about the real cause of malaria by some of the respondents who associated malaria with alternative causes such as; genetic inheritance, eating of oily foods, eating of sugary foods, eating of raw vegetables, etc. Further some had attributed the cause of malaria to evil spirits and witch crafts having such misconceptions or cultural explanations as they associated malaria with traditional and local beliefs and presumed that they do not understand biomedical facts.

From a community perspective, community knowledge of malaria symptoms, such as fever accompanied by shivering, fever on alternate days, headaches, vomiting and rigors is very important for malaria control.

With respect to the sources of information for malaria among the community members the main source being the health workers of village Anganwadi Centre. Further the elderly members of the community play a vital role as source of information by sharing their knowledge and experience with others. The mass media is the ultimate source of information for malaria to the community people.

Another interesting finding was the majority of the respondents preferred to seek treatment from both traditional and modern methods. The results showed that they use multiple sources of health care for treatment of malaria. Primary health centre, home remedy- self-medication and traditional healers were the main providers for treatment. It was often reported that they have learnt from experience that the other forms of treatment are not much efficient as compare to their traditional forms of treatment which is widely used in their community. Despite the fact that people switch from one health care source to another as time passes and their condition persists. Further communication barrier between the Oraons and the health personnel acts as a barrier to access to the primary health centre.

The results from this survey suggest that most respondents showed some form of malaria awareness. Household heads perceived malaria as the most widespread and serious health problem in the community meaning a high health burden to the household emphasising that malaria is prevalent all year around. They were aware that mosquitoes were the source of malaria; but very few respondents reported using of preventive measures against the acquisition of mosquitoes. They also reported that malaria can be prevented to some extent by avoiding mosquito bites through the use of insecticide- treated bed nets (ITNs), burning of coils and strong-scented leaves available from the nearby forest.

The present study among the Oraons has delivered insights into the knowledge of malaria of the respondents of the village. Majority of the respondents of this study sought did not seek treatment for their diseases within the right time of first onset of symptoms. There is still need for information, education and communication campaigns and behaviour change campaigns in the village to achieve malaria control and to highlight the benefits of early diagnosis and treatment of the disease. Existing health facilities in the studied area are inadequate to control malaria. To sustain malaria prevention and control extensive work, it is expected to change perception of the community on malaria through health education. Further attitude of the patients toward health facility services and perceived susceptibility of patient for malaria disease were the most significant predictors for the respondents to sought treatment as early as possible. With greater emphasis being placed on community control and prevention, health education based on understanding individual as well as community behaviour, attitudes and knowledge pertaining to malaria is moving to the forefront as a measure necessary for malaria control.

Conclusions

The findings of the present study reveal that the majority of the study participants had adequate knowledge regarding the symptoms, causes and transmission of malaria. They also had

ample enviable health seeking behaviour as they actively seeking medical help from the available sources of treatment.
Moreover this behaviour of the community people is by and large influenced by their cultural practices and perceives quality of the health facility. Because the public health facilities are grossly inadequate to meet the felt need of the community. However, still a sizable proportion had misconception regarding the causes and transmission. The correction of such misconceptions about the relationship between mosquito bite and malaria through health education messages is critical for the success of malaria prevention and control. But making educational messages culturally sensitive is paramount to capitalise on the positive beliefs and behaviours that already exist in the community.

There is a need to improve the behavioural patterns and attitudes regarding malaria management and control by dissemination of appropriate information on malaria through active education campaigns using media advertisements, workshops among health workers, which should be based on a sound understanding of the socio-cultural norms of the community. Indeed, it is a major barrier to implement effective as well sustainable malaria control strategies.
Appropriate communication strategies should be designed and implemented and the improved health service in terms of availability, quality and accessibility can go a long way in tackling the problem and bring the constructive outcome in the near future.

Fig 3: Researcher while interviewing to the Traditional Healer of the Oraon Community of the studied area

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