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## The perception of mothers' and pattern of TSB regarding childhood malaria among the Gond tribe of rural western Odisha

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### Abstract

Malaria had been a major concern all the time world over as it eluded treatment for a long time. Despite decades of great control and prevention efforts, it still remains a major global public health problem affecting all ages. For management of malaria, there's a requirement to offer attention on specific group of individuals like children <5 years of age in the community. This is directly linked to the level of education, socioeconomic status, timely decision of the mothers who can seek, obtain, and use medication appropriately and it also depends upon the accessibility of health facility. The present study was undertaken with the aim to know the sign and symptoms, treatment seeking behaviour and exploring factors involved in the selection of different treatment options for febrile children under five years of age among the Gond tribe in the Babuchipidih village of Laikera block of Jharsuguda district of Western Odisha where malaria remains a major cause of morbidity and mortality among the said group of people. This was a Cross-sectional community based descriptive study which included women between the age of 20-55 years who were the mothers of the febrile children. In such situation only (7.33%) mothers seek the help of the government medical facility. The sources of initial treatment were self-treatment (32.66%), traditional healer (34%), community health workers (10.66%) and village health sub-centre (15.33%). Self treatment accounted for most of initial treatment sought by the sample respondents because of personal experience and inexpensiveness. So far as the preventive measures are concerned it requires relieving poverty and reducing cost of allopathic care with sufficient supplies of effective anti-malarial drugs and to improve malaria treatment skills in households of the community.

**Keywords:** childhood malaria, *Plasmodium falciparum*, self-treatment, traditional healer, village health sub-centre, treatment seeking behaviour (TSB)

### Introduction

Malaria exerts an important toll of illness and death, especially amongst children and pregnant women. According to the World Malaria Report (WMR) 2013, India accounted for approximately 52% of the two million confirmed malaria cases in South-East Asia (WHO, 2013) [22]. It remains one of the leading cause of morbidity and death in children under 5 years of age. It is estimated that more than 300,000 people, die of this disease every year, most of them are pregnant women and children. Children under 5 years of age are the group most affected by malaria. In 2015, an estimated 429,000 people died of malaria globally, including 303,000 (70.6%) children under 5 years of age. The world-wide statistical data also reveal that malaria is the main cause of fever in children <5 yr of age in most cases. In addition to its impacts on health, malaria has continued to be responsible for weakening the economies of many countries and worsening their poverty cycle. Despite decades of great control and prevention efforts, it still remains a major global public health problem affecting all age groups (Strategic Action Plan) [14].

Malaria is still a major public health challenge in India, accounting for two third of the cases of malaria confirmed by parasitology (WHO, 2012) [21]. It continues to cause many deaths in malaria-endemic countries where there is a limited healthcare facility. India is the most populous country in which malaria remains common. The number of cases and deaths reported by the Indian Government are mainly concentrated in some states in eastern and north-eastern India (states with a "high incidence of malaria", mainly Odisha as well as CG, Jharkhand and the states in the north-eastern tip of India). The transmission of disease is

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geographically restricted however (Dhingra<sup>[3]</sup>; Dash<sup>[2]</sup>). In addition, the north-eastern, central and eastern states of India are considered areas of high Malaria transmission, accounting for nearly 80% of the total incidence of malaria and number of deaths reported in the country (Patil<sup>[9]</sup>; Annual Report to the people on Health Government<sup>[1]</sup>). Among these, Odisha is the most severely affected state (Sahu)<sup>[11]</sup>.

In areas with high levels of transmission, partial immunity to the disease is acquired during childhood. In such settings the majority of malaria disease, and particularly severe disease with rapid progression to death, occurs in young children without acquired immunity. Severe anaemia, hypoglycaemia and cerebral malaria are features of severe malaria more commonly seen in children than adults. From 2003 to 2013, Malaria continued to ravage the seven southern districts of Kandhamal, Kalahandi, Rayagada, Koraput, Nowrangpur, Nuapada and Malkangiri as well as two central districts of Sambalpur and Deogarh, which were consistently in the VH incidence zone (Pradhan A)<sup>[10]</sup>. This is always influenced by several factors, especially in rural communities. The annual number of malaria cases/1000 inhabitants in the forest (347.9) is much higher than in the plain (61.0). In the forest, clinical malaria is more common in children than in adults, but it is equally affected all age groups in the lowlands. The prevalence of infection in forest areas is higher in the young children (aged 1-5 years) and gradually decreases with age. The highest incidence of *Plasmodium falciparum* malaria (0.90 episode/person-year) was also recorded in the subjects from the forest who were aged 1-5 years (Sharma SK)<sup>[12]</sup>.

Treatment-seeking behaviour of the people, especially of mothers is related to Socio-cultural beliefs about the cause of the disease and its curability. Studies have found that the choice of treatment source is influenced by accessibility, type and severity of the disease, the gender of the patient and the educational level of the parents. The attitude of users towards health care providers is also an important factor. Most of the parents are more likely to start treatment at home as this practice yields them to minimize the cost and sufferings in remote areas where transportation and medical facilities are problematic. Inappropriate treatment seeking behaviour and self-medication prior to visiting health facilities were the main causes of disease progression and death. A delay in treating *Plasmodium falciparum* (*P. falciparum*) malaria is especially serious because severe complication may occur within a few hours, and cerebral malaria is the most severe complication of *P. falciparum* infection can occur in patients and cause death (WHO, 2010)<sup>[19]</sup>. Early diagnosis and timely treatment are the cornerstones of the fight against malaria. However, effective case management partly depends on early detection of the disease and subsequent diagnosis and prompt treatment should be made within 24 hours of the onset of symptoms.

Although the studied area has partially implemented malaria control programme, the rate of malaria control for children under five years of age is still extremely high. The strategy mainly includes the use of indoor residual spraying and mass distribution of long-lasting insecticide treated mosquito nets. It is well recognized that accessibility to anti-malarial interventions alone will not bring about the expected changes. A number of studies have shown that compliance with anti-malarial interventions is highly dependent on social, behavioural and cultural factors. In

addition, there are factors such as vulnerability, economic constraints, and the lack of adequate health services which play an important role in explaining the health seeking behaviour among the target population.

Childhood mortality due to malaria has been attributed to poor health service delivery and ignorance associated with cultural beliefs and practices. It has been suggested that social and cultural determinants of behaviour may account for the gap between awareness of modern health measures and health-seeking behaviour. Prompt access to early diagnosis and effective anti-malarial treatment at health facilities is one of the major strategies for reducing the burden of malaria. Therefore effective information strategies which address understandings and beliefs about the disease are necessary. Early treatment of childhood malaria depends upon mothers' perception about malaria and prompt detection of signs and symptoms of malaria in children in addition to accessibility and utilization of the appropriate health services. Therefore studies are needed at the local level to understand the dynamics of this disease in a specific context.

### Overview of Literature

A study of the epidemiology of transmission of malaria was undertaken by Sharma *et al.*<sup>[13]</sup> in 13 tribal villages located in forest and plain areas of Sundergarh District of Odisha, India from Jan 2001 to Dec 2003. They found intense transmission of malaria is attributed to the highly anthropophilic vector *Anopheles fluviatilis* sibling species *S* and is complemented by *A. Culicifacies* sibling species *C*. in forest areas. Similarly baseline demographic data were collected on all of the patients with confirmed slide-positive *falciparum* malaria at the paediatric ward of SCB Medical College in eastern India (Odisha) to find out major syndrome and predictors of death among critically ill Indian children and to identify factors that could be used to improve the approach to their treatment (Tripathy R)<sup>[15]</sup>. Hay SI<sup>[4]</sup> has the opinion that efficient allocation of resources to intervene against malaria requires an in-depth understanding of the contemporary spatial distribution of malaria risk. His study describes the generation of a new World map of *Plasmodium falciparum* malaria endemicity for the year 2007. He further describes there are significant opportunities for malaria control in Africa and for Malaria elimination elsewhere and through 2007 global *P. falciparum* malaria endemic map it will be possible to monitor and evaluate the progress of this intervention process. According to Odisha State Malaria Information System (OSMIS) National Vector Borne Diseases Control Programme (NVBDCP) addresses six vector borne diseases; Malaria, Filarial, Dengu, Chikungunya, Japanese Encephalitis and Kala-azar. NVBDCP is an umbrella programme for prevention and control of the entire above said Vector Borne Diseases (VBDs) and an integral part of India's National Rural Health Mission (NRHM). The NVBDCP envisages different strategic interventions in Odisha to address malaria, filariasis, chikungunya and dengue together with Millennium development Goal 2015 to reduce mortality and morbidity due to vector borne diseases which pose public health concern in the community (NVBDCP)<sup>[7]</sup>. Malaria is an acute parasitic illness caused by *plasmodium falciparum* or *plasmodium vivax* in India. The main clinical presentation is fever with chills; however, nausea and headache also can occur. Malaria continues to pose a serious public health threat in several parts of the

country, particularly due to *plasmodium falciparum* due to which severity may develop and may cause fatality, if not treat early (NIMR & NVBDCP) [6]. In India, 556 persons per 100,000 populations were reported to have suffered from malaria (662 per 100,000) than urban residents (332 per 100,000). The reported prevalence of malaria is higher for females than for males. The prevalence of malaria is higher within the north-eastern states of Meghalaya (4,591), Arunachal Pradesh (3,256), Mizoram (2,856), Nagaland (2,102), Tripura (1,132) and Manipur (1,071). Others states where prevalence of malaria is high are Chhattisgarh (1,627), Gujarat (1,057), Madhya Pradesh (1,657), Maharashtra (1,311), Odisha (1,892), Rajasthan (1,144), Uttar Pradesh (1,003), Uttaranchal (1,093), Jharkhand (982) and Assam (864). In the remaining states in India prevalence of malaria is below the national average of 556 per 100,000 population (IIPS) [5].

### Objectives

The purpose of this study is to identify the different beliefs and practices of the Gond community on the basis of which fever could be detected and classified and explore factors that influence the choice of different treatment options. In this context, the present study has the following objectives;

- Assessment of signs and symptoms, treatment-seeking behaviour, treatment administered, timeliness related to childhood malaria,
- Establishing mothers' perception of aetiology and severity of malaria in children,

The study also aimed to provide information about the knowledge, practices, and attitudes of the targeted population. This will inform the development of locally appropriate health education interventions for the control of childhood malaria.

### Methodology

#### Area and People

This is a Cross-sectional community based descriptive study which was carried out among the Gond tribe of Babuchhipidihi Gram Panchayat of Laikera block of Jharsuguda district. The total area of Jharsuguda district covers 2881 sq km. It is bounded on the east by Kuchinda, west by Raigarh, south by Sambalpur and north by Sundergarh. The study village lies about 15 kms from Laikera block. Laikera block consists of eleven Gram Panchayats out of which Babuchhipidihi Gram Panchayat has six villages these are Babuchhipidihi, Dudukabahal, Banki, Pankelkhol, Baiganbud and Kuanramal. The Gonds of the sample villages namely, Babuchhipidihi, Dudukabahal, Pankelkhol, Baiganbud constitute 124 households having a total population of 616 (male 279 and female 337) and i.e. 63.26% of the total population of the sample villages. Out of 337 numbers of females, 150 are our sample respondents who are the mothers of the children under five years of age. The Gonds (also called the Binjhals) were the ruling castes of the Sambalpur tract. They

represented a number of Zamindaris under the Chauhans. They migrated from the highlands of central India and settled down in the hilly tracts of the western Odisha. The villagers mainly depend upon agriculture and somehow on daily wage works and most of them are illiterate. A hot dry summer and uneven distribution of rains of south-west monsoon season characterised the climate of Jharsuguda district. The cold season commences from November and lasts till the end of February. Temperature begins to rise from about the beginning of March steadily till May, with the maximum temperature of 45° C, the heat prior the onset of the south-west monsoon is tiring from about the middle of November the day temperature also begins to drop rapidly and December usually coldest month. The clouding is moderate in the later half of summer and the past monsoon months. There is a Health sub-centre available in the village Babuchhipidihi. It lacks medical equipments and the health workers are not coming regularly. In major cases some prefer to go to Government hospital situated in district headquarter of Jharsuguda. No electrification has been made in this village. But some have this facility. Due to poor standard of living almost 95% of the villagers are unable to electrify their house.

### Study design

The sample population consisted of women between the ages of 20-55 years. It was not specifically targeted at only mothers who had children less than five years aged as it was expected that majority of the households would have children under five years. Among four selected villages a total of 150 female respondents were selected by using simple random sampling having the aim to provide baseline data on the prevalence of malaria, the molecular characteristics of *Plasmodium* and the vectors for malaria transmission in children in the area. The study also aimed to provide information about the knowledge, practices, and attitudes of the targeted population.

Malaria in this area is highly problematic due to mismanagement of water supply to the villages for irrigation and drinking purposes. There is an ongoing project near to Babuchhipidihi village called 'Hatis Nala'. The people of Dudukabahal, Pankelkhol village are getting water for cultivation. But the Babuchhipidihi is situated upper side of the project area so they hardly get water for irrigation facility.

### Data collection

For the collection of data Pre-tested, structured, close-ended questionnaires were administered. Focus group discussions were also carried out in the selected villages with the mothers of febrile children. Information obtained from the respondents included socio demographic data, knowledge of the main cause of the malaria, its transmission, recognition of signs and symptoms of malaria in their children, their sources of information, order of preference regarding seeking treatment for febrile diseased children and so on.

### Data analysis and Result

#### Selected Demographic Characteristics of the Respondents

**Table 1:** Selected demographic characteristics of the respondents

Characteristics	Frequency (n= 150)	Percentage (%)
<b>Age group</b>		
20-24	7	4.66

25-29	43	28.66
30-34	38	25.33
35-39	21	14
40-44	16	10.66
45-49	19	12.66
<b>50+</b>	<b>6</b>	<b>4</b>
<b>Marital Status</b>		
Married (monogamous union)	79	52.66
Married (polygamous union)	34	22.66
Single	12	8
Separated	8	5.33
Widowed	14	9.33
Divorced	3	2
<b>Educational Level</b>		
Illiterate	68	45.33
Literate	Primary	34
	Middle	19.33
	Secondary	1.33
<b>Occupation</b>		
Housewife	39	26
Farming	27	18
Agricultural labour	40	26.66
Wage Labour	31	20.66
Business (own grocery shop)	6	4
Others	7	4.66
<b>Mothers according to Socio-economic Status</b>		
Low	87	58
Middle	54	36
High	9	6
<b>Mothers according to children (09-58 months)</b>		
Single child	53	35.33
More than one child	97	64.66
<b>Children according to age (months)</b>		
	<b>Frequency (n= 317)</b>	<b>Percentage (%)</b>
<09	13	4.1
09-18	39	12.3
19-28	43	13.56
29-38	37	11.67
39-48	76	23.97
49-58	109	34.38

**Source:** Fieldwork and Population Register of the Anganwadi Centres

The sample respondents were between 20-55 years of age. Majority of the women were between the age group of 25-29 i.e. 43 (28.66%) in number. So far as the marital status is concerned it is categorised into six number of status. Out of them some are acted as single mother (8%), some are separated from their spouse but do not get divorced yet (5.33%), widowed (9.33%), divorced (2%), more than fifty percent women are having monogamous family (52.66%) where one person have only one mate at a time while polygamous marriages are also practised among the sample population, for this reason 22.66% women belong to polygamous family. In terms of educational background

45.33% reported receiving no formal education, 34% attended primary school, 19.33% had ME standard, and 1.33% had progressed to secondary school. Majority of the respondents were employed as agricultural labourer (26.66%), 20.66% were wage labourer; farming was practiced by 18% of the respondents, 4% had opened small grocery shop adjacent to their houses. About 58% and 36% subjects belonged to low and moderate socioeconomic class respectively. 35.33% of the respondents are the mother of single child whereas 64.66 have more than one child (Table-I).

### Recognition of Signs and Symptoms of Malaria in Children

**Table 2:** Respondents recognition about sign and symptoms of malaria in children

Signs and Symptoms	Frequency	Percentage (%)
Fever	113	75.33
Shivering/ Chills	96	64
Yellow eyes	34	22.66
Head ache	22	14.66
Restlessness	31	20.66
Diarrhoea	8	5.33
Rash on the body	19	12.66
Cold and cough	82	54.66
Chest infection	66	44



Loss of appetite	64	42.66
Vomiting	28	18.66
Spleen enlargement	23	15.33
Anaemia	17	11.33
Convulsion	6	4

Multiple Responses have been reported

The illness of the child was being observed by the mother by his or her inactive in routine activities and dull appearance. They considered fever to be “jar” in their local dialect which is explained as raised body temperature as compare to normal body temperature. As Table-II shows they indicated awareness of common signs and symptoms in both adult and children the most common symptoms recognized locally as being associated with malaria in children was fever (75.33%) followed by shivering/ chills

(64%), cold and cough (54.66%), chest infection (44%), loss of appetite (42.66%). However some mothers also mentioned yellow eyes (22.66%), restlessness (20.66%), vomiting (18.66%), spleen enlargement (15.33%), head ache (14.66%) and so on. Besides in-depth interview, during focus group discussion also the sample mothers expressed fever (jar) is dangerous, if it is not cured, it leads further complications in the body and ultimately death.

**Knowledge and perception about main cause of malaria in children and its transmission**

**Table 3:** Respondents knowledge and perception about main cause of malaria and its transmission

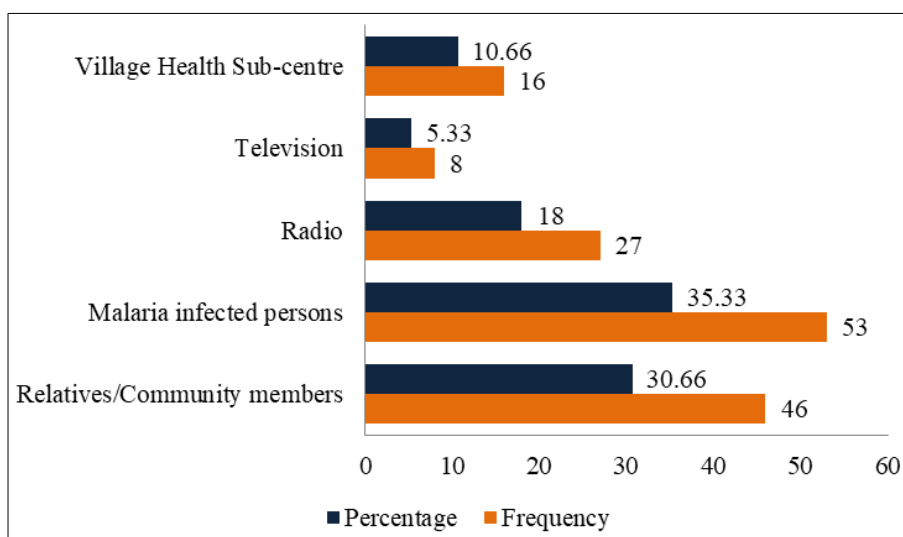
Variables	Frequency	Percentage (%)
<b>Causes of Malaria as perceived</b>		
Mosquito bites	122	81.33
Wet climate	59	39.33
Dirty environment	74	49.33
Drinking dirty water	51	34
Unhealthy surrounding	62	41.33
Evil spirit	35	23.33
<b>Transmission of Malaria</b>		
Mosquitoes coming from the infected person	67	44.66
Poisonous mosquitoes	72	48
Dirty stagnant water	103	68.66

Multiple Responses have been reported

There was no statistically significant association between the level of education and having knowledge of the cause of malaria (Table-III). A majority (81.33%) of the sample mothers correctly identified mosquito bite as the main cause of malaria. Some considered dirty environment (49.33%) and wet climate (39.33%) were the main causes of malaria. Other reported causes were drinking dirty water (34%) and unhealthy surrounding (41.33%). Some also had the perception that due to the effect of evil spirit (23.33%) they fell ill.

**Main Sources of Information about Childhood Malaria**

As the mothers showed a very wide range of sources of information regarding malaria in children they elaborated their relatives/community members (30.66%) were the main source of information but in many of the cases they seek information from the persons infected with the same. Other sources of information included village health sub-centre (10.66%) followed by radio (18%) and only (5.33%) through television (Figure-I).



**Fig 1:** Sources of information about childhood malaria

### E. Choices made concerning where Treatment was first sought for Malaria in Children

According to the sample respondents it was not necessary to follow the same pattern of treatment in all the cases. However use of herbs and self-treatment based on the knowledge and experiences of the mothers or elderly women of the family or experienced and practicing women within their community, health workers of their community, village health sub-centre, district government hospital and their traditional healer were the available options for selection of health care for the febrile children. It was the common practice among the sample mothers to treat febrile child herself at home. They used chloroquine, aspirin and paracetamol purchased from medical shops of nearby villages. They have stated that by doing this they were able to get rid off suffering from fever within or before the time period of reaching health facility.

Respondents were also questioned on their treatment seeking behaviour for that episode of suspected malaria with regards to where treatment was first sought and reasons for choice of a specific care provider. Only (7.33%) prefer to go to the district government hospital situated in Jharsuguda

due to non-availability of public transport facility in and around their village as it is far away from the village. Some have the opinion that health personnel were not available at village health sub-centre at the time of urgency of the febrile child due to off time of the health staff at the place. That's why only 15.33% of the respondents used to seek the help of the village health sub-centre within 24 hrs of the onset of fever. 10.66% prefer community health workers by whom the treatment was first sought for Malaria in children. Many of the time the choices for treatment are based on the severity of the illness of the child. They felt themselves helpless and wanted to consult the elderly persons of their community (or self- medication) without any delay if the child suffering from high fever, stop eating, unable to suck mother's milk, unable to stand or walk properly, loss of consciousness, repeated vomiting, and so on. Sometimes it happens during the night, in this kind of situation they could not wait till morning. 32.66 % of the respondents however prefer self-treatment as the first line of action. Majority of the respondents (34%) usually seek the help of the traditional healer because of its inexpensiveness and efficacy (Figure-II).

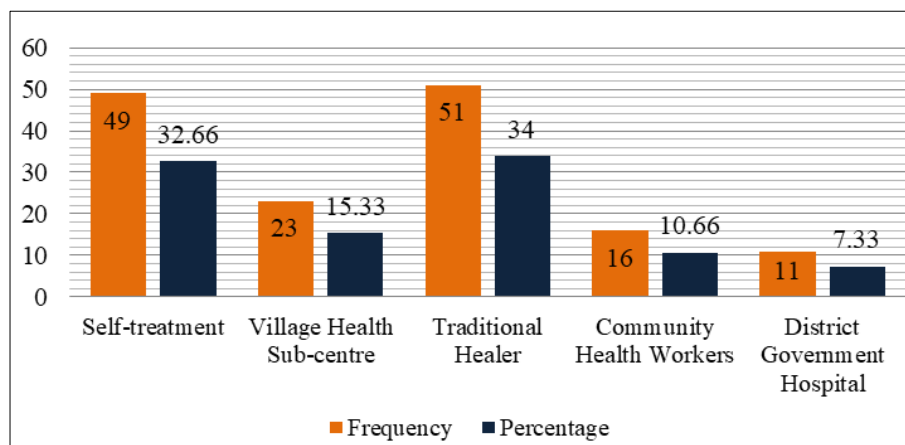


Fig 2: Order of preference regarding seeking treatment for febrile children as reported by sample mothers

### Discussions

The present study offered several insights about the health-seeking behaviour of the mothers for children with reported malaria, the household diagnoses, the perceived symptoms, the treatments administered and the treatment costs in the villages of Babuchipidihi GP of Laikera block of Jharsuguda district. It is very essential for the parents to detect and classify the disease among the children <5 years of age who suffered from malaria. It is very interesting to learn from the present study that fever and malaria were understood correctly by the majority of the mothers and fever was the main symptom associated with reported malaria in children. In spite of their low level of education it had not appeared as a strong barrier on the knowledge regarding its causes, transmission and symptoms. However they had their source of information as relatives/community members, malaria infected persons of their community, village health sub-centre and sometimes they learnt it from television and radio.

The results of this study depicts the mothers knowledge about malaria, its causes, transmission and was also combined with various symptoms like; weakness, headache, repeated vomiting, restlessness, diarrhoea, shivering loss of appetite, refusal to feed, yellowish sclera, etc. Many options

for treatment such as traditional healer of the community, self treatment, village community health workers, village health sub-centre, and district government hospital were being used to treat malaria in children under five years aged. The most preferred first option for management of childhood malaria practised by the mothers and family members was self treatment at home before going to any health facility for the febrile children; it is because of good personal experience. The options for treatment sometimes depend on the seriousness of the child and cost of treatment. Here financial access acts as a major barrier in seeking different treatment options. Having greater believes and hope to cure their febrile children most of the mothers started treatment at home; sometimes with the help of the elderly members of the household or the community. Traditional healers were the main providers for treatment; it was often reported that the tribal have learnt from experience that the other forms of treatment are not most efficient as compare to their traditional forms of treatment which is widely used in their community (Patel SP)<sup>[8]</sup>. The traditional healers generally used local herbs which are easily available in the nearby forest; hence the villagers get it free of cost. Therefore he acts as the immediate source of treatment in the community.

Besides all these if all the attempts fail to cure fever in child they seek treatment from the nearest health facility but it has many lapses. They also stated that lack of health care facilities at their village and the cost of travel to reach the district government hospital force them to treat their child at home and seek the help of the experienced elderly community members. They further stated that the way their traditional healer treat any ailment gives them with immense satisfaction. Hence the delay in seeking care at health facilities level was related to existence, accessibility, satisfaction and cost of service.

### Major Findings

- Present study gives the true picture of sample villages that PHCs/Sub-centres services are not able to control malaria in the area so that case management practices at the community level seems very essential.
- Self-treatment was common among them.
- Somehow the low level of awareness of the mothers of the cause of malaria which includes wrong beliefs (*evil spirit*) and perceptions may increase the morbidity and mortality of malaria in children of this area.
- The treatment-seeking behaviour of each mother is largely determined by their perception of the concerned treatment-seeking behaviour for their febrile child.

### Suggestive Measures

- The delays in seeking treatment outside home, the sort of malaria therapy received, and the treatment cost were the principal problems that require to be addressed.
- To reduce malaria morbidity and mortality within the area would require stressing the importance of prompt treatment within 24 hours of onset of illness.
- This might be made possible by giving proper training to the mothers then on the community members to acknowledge the right malarial symptoms at early stage and knowledge of proper and required doses of effective anti-malarial drugs and skill for case management at home.
- The level of awareness must be rectified by health education intervention programmes which can address wrong beliefs and perceptions. This may aid rapid diagnosis and treatment and also in line with building community awareness as a part of the elements of the Roll Back Malaria Initiative.
- It is additionally recommended that this category of individuals who practised home treatment be trained to diagnose, treat malaria correctly in children and recognise when to refer to the health facilities.
- Further there will be a need for health education intervention programmes and putting in place measures to alleviate poverty and reduce cost of allopathic care.
- Health care workers are needed in both the general public and private sectors.

### Conclusion

The World Malaria Report 2009 describes the worldwide distribution of cases and deaths, how WHO recommended control strategies are adopted and implemented in endemic countries, sources of funding for malaria control and recent evidence that prevention and treatment can alleviate the burden of disease. (Half of the World's population is at risk of malaria and an estimated 243 million cases led to nearly

863000 deaths in 2008) (WHO, 2009) [17]. The World Health Organisation (WHO) currently estimates that Malaria causes only 15,000 deaths per annum in India (5000 childhood, 10000 thereafter) (WHO, 2008) [16]. Of all coded deaths at ages 1 month to 70 years; 3.55% (2681/75342) were attributed to malaria. Of these 2419 (90.22%) were rural & 2311 (86.19%) were not in any healthcare facility. Malaria attributed death rates correlated geographically with local malaria transmission rates derived independently from the Indian malaria control programme, and rose after the wet season began. The adjudicated results suggest 205,000 malaria deaths per annum in India before age 70 (55000 in infancy, 30000 at ages 5-14, 12000 at ages 15-69); cumulative probability 1.8% of death from malaria before age 70. Plausible upper and lower bounds (based only on the initial coding) were 125000 to 277000 (Dhingra N) [3].

Existing health facilities in the study area are inadequate to control malaria in children. The mothers as well as the villagers may want to seek advice from health personnel but they are unable to do so due to lack of connectivity with public transport and its high cost if they hire so. Therefore, home remedy strategy may be encouraged by the community members to control malaria. Volunteers could also be selected at village level and make them trained for the proper diagnosis, administration of appropriate doses of anti-malarial drugs and case management at home. This approach could also be helpful to scale back the burden of disease and prevent the deaths due to malaria. After giving medical aids at village-level, cases could also be referred to nearest health facility to avoid further complications and better health care. Assess to free transportation, free diagnosis and treatment which acts as major determinant in malaria control need to be reinforced in these rural villages.

WHO recommends the following package of interventions for the prevention and treatment of malaria in children; use of Long-Lasting Insecticidal Nets (LLINs), prompt diagnosis and effective treatment of malaria infections. World Malaria Report 2010 highlights continued progress made towards meeting the World Health Assembly (WHA) targets for malaria to be achieved by the end of 2010 and by 2015 (WHO, 2010) [18]. In 2015, 31% of eligible pregnant women received three or more doses of Intermittent Preventive Treatment In Pregnancy (IPTP) among 20 countries with sufficient data, a major increase from 6% in 2010 (WHO, 2016) [23]. There were 212 million cases of worldwide. Between 2010 and 2015, there was 21% global decrease in malaria incidence. Between 2010 and 2015, there was 29% decrease in global malaria mortality rates (WHO, 2017) [24]. There is a clear progress in the fight against malaria and a decline in estimated malaria cases and deaths. Prevention and control measures according to a comprehensive set of indicators, and highlights continued progress towards global malaria targets (WHO, 2011) [20].

Malaria, a non-fatal disease though detected early and treated appropriately, it still causes many deaths in malaria-endemic countries where there is limited healthcare facilities. National malaria mortality rates are, however, particularly difficult to assess reliably in such countries, as any fever reliably diagnosed as malaria are likely therefore to be cured. Hence, most malaria deaths are due to undiagnosed malaria, which may have been incorrectly attributed to other febrile causes of death in retrospective studies and vice versa.

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