

## Original Research Article

DOI: <https://dx.doi.org/10.18203/2394-6040.ijcmph20212016>

# Community knowledge, attitude and practices regarding malaria and long-lasting insecticidal nets in Churachandpur, Manipur

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**Received:** 19 April 2021

**Accepted:** 11 May 2021

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## ABSTRACT

**Background:** The disease is endemic in many parts of India, especially in the North- Eastern region. A study was done on head of the family's knowledge, attitude and practice regarding malaria and long-lasting insecticidal bed nets and to determine the association between socio-demographic profile and knowledge and attitude.

**Methods:** A cross-sectional study was conducted in the communities from 3 subcentres namely Pearsonmun, Thingkhangpui and Soipum under Saikot PHC, Churachandpur district of Manipur. House to house survey was carried out and only those who are eligible were interviewed using structured questionnaire. Random sampling and PPS was carried out to select the households head. SPSS was used for analysis.

**Results:** Total of 289 heads of the family was interviewed. The total adequate knowledge score was 30.6% and only 26.3% had favourable attitude towards malaria and long-lasting insecticidal bed nets. There was significant association between marital status, educational qualification, occupation and monthly income with adequacy of knowledge. There was significant association between religion and attitude.

**Conclusions:** Majority of the participants still lacks knowledge and attitude towards the malaria and long-lasting insecticidal nets (LLIN). IEC and awareness campaign should be carried out intensively and further study to be done to see the improvement of knowledge.

**Keywords:** Knowledge, Attitude, Practice, LLIN, Malaria

## INTRODUCTION

Malaria is distinct and unique disease as its root lie within human communities.<sup>1</sup> The disease is endemic in many parts of India, especially in the North- Eastern region. Malaria beliefs and practices often related to the culture and influenced the effectiveness of control strategies. Thus, the local perception towards malaria were important for the implementation of appropriate, sustainable and effective interventions.<sup>2</sup> Families are the first contact within which most health problems starts and had a powerful influence on health of each member. Most health belief and behavior were starts within the family. Family's perceptions, beliefs, and attitudes toward malaria causation, symptoms and prevention influence efforts to

address often overlooked in control efforts and this vary from community to community and individual households.<sup>3</sup> The use of long-lasting insecticidal nets is one of the major malaria vector control strategies in besides other measures like IRS, personal protection etc.<sup>4</sup> Many countries have achieved maximum coverage and high ownership with long-lasting insecticidal nets (LLIN) and approaching the universal coverage target of one net for every two people of the population at risk as recommended by WHO, but questions remained on its sustainability and its effectiveness.<sup>5</sup>

According to World Health Organization (WHO), globally cases was 219 million in 2017. The number of deaths was 4.38 million in 2015 and about 7% of deaths in Under-five

children were reported malaria worldwide. In India 27% 0.63 million cases were detected and 190 deaths were reported.<sup>6</sup> In Manipur, 216 cases were detected, out of which 119 were due to *P. falciparum* with no death in 2015 and has a literacy rate of 82.78%.<sup>7</sup> Churachandpur district has seen a rise in malaria cases in recent times. In 2015, there were 141 positive malaria cases compared to 2014 where only 57 malaria positive cases. So, it has contributed 65.27% to Manipur's (216) total malaria cases in 2015.<sup>8</sup> The current strategic approaches to malaria control emphasize prevention through the use of LLIN. However, effectiveness of LLIN use is dependent on attitudes and socio-cultural context of the community. Understanding the community knowledge about malaria and LLINs would help in designing sustainable malaria control programmes that would lead to behavioural change and adoption of new ideas.<sup>3</sup> Under the National Vector Borne Disease Control Programme (NVBDCP), Manipur, LLIN was supplied in 2011 and again in June 2016. However, there were very few literatures to assess its knowledge, attitude and practice towards its usage in the community. In Manipur, no study has been conducted so far on knowledge regarding malaria and LLIN. Thus, this study was conducted to determine the knowledge, attitude and practice regarding malaria and LLIN in the community and to assess the association between knowledge and attitude with socio-demographic profile.

## METHODS

A cross-sectional study was conducted from July 2016 to October 2018 in the communities from 3 subcentres namely Pearsonmun, Thingkhangpui and Soipum under Saikot PHC, Churachandpur district of Manipur. Saikot PHC is 5 kms away from district headquarter and covers a population of 1, 97,001 and 14 sub-centers with 243 villages. It is around 68 kms from Imphal, having an area of 4,570sq.km. All the head of the family or if the head was not available at the time of visit, any family member who was 18 years and above who received at least one LLIN and those who refused the LLIN were included. Those who refused to participate and those who could not be contacted after two visits were excluded from the study. Taking prevalence of knowledge of cause of malaria 879 with an accuracy of 4% and 95% confidence level, the sample size was 271 households but rounded to 290 after taking 5% non-response rate. Three subcentres chosen based on the LLIN distribution. There were 1881, 7230 and 560 households who had received LLIN under the above said subcentres respectively. By using population proportionate to size (PPS) 57 households, 216 households and 17 households respectively, were chosen from each sub-centre. The households were selected by using simple random sampling (SRS) from beneficiary list of LLIN by lottery system by the name of the head of the household. If any household identified was found ineligible for the study, another household was identified from the list. Age, sex, marital status, education, occupation, religion, family size and monthly income were independent variables. Knowledge (adequate and inadequate), attitude

(favourable and unfavourable) and practices regarding malaria and LLIN were the dependent variables. An interview was carried out to collect data from the households. Questions were framed in four domains-socio-demographic characteristics, knowledge on malaria and LLIN, attitude and practices regarding malaria and LLIN. Knowledge questions covered the following items like basic knowledge of malaria, its symptoms, transmission, prevention and about LLIN like its uses and maintenance, which were closed ended. For knowledge questions, score of 1 or 0 were given to those questions which were answered either as yes/no. For correct answers 1 and 0 for incorrect was given. If the answer was no in question number 1 no further question was asked, but if answer was no to question no. 8, interviewer jumped to attitude questions. There were 12 questions on knowledge and scores ranged from 0-12. Based on 75th percentile i.e those who scored 8 and above were classified having adequate knowledge. There were altogether 9 attitude questions and was recorded on 5 point Likert scale which ranged from strongly disagrees to strongly agree. Question number 1-4 and 9 were reverse scoring questions. Those who scored  $\geq 38$  were considered as having favourable attitude. 10 questions were included to test the practices, which were closed-ended questions. Practices were explained in proportions. The house was chosen as it appeared in the beneficiary list and only those who are eligible were interviewed after taking written informed consent. All the data were collected using structured interview schedule. Data were entered in IBM Statistical package for social sciences (SPSS) (version 21 software). Descriptive statistics like mean, frequency and proportion were used for socio demographic variables. Chi-square test was used to test the significance between proportions. A p-value of less than 0.05 was considered as statistically significant. Ethical approval was obtained from the Research Ethics Board, RIMS, Imphal before the beginning of the study and written permission from the Director of Health Services, Manipur was sought. Written informed consent was taken from the participants.

## RESULTS

Total 289 heads of the family were interviewed, only 1 household could not be interviewed as they have shifted to different location. Only 30.6% had adequate knowledge and only 26.3% had favourable attitude. Minimum age of the participants was 18 years and maximum age being 74 years with mean age of  $38.2 \pm 12.7$  years. Majority of the respondents were males (65.1%). One-fourth of the participants (26.3%) finished secondary schools. Maximum responders were farmers (40.8%) while almost one-fourth were business by profession (24.9%). Majority (93.1%) of the participants were Christian. Nearly half of the participants had family size of 3 to 5 members (48.1%) while 46.7% had family size of  $\geq 6$  members. Nearly half of the respondents had a monthly family income of 7001 to 20000 (47.4%). Almost all the participants had heard about malaria (99.7%).

**Table 1: Background characteristics of the participant (n=289).**

Characteristics	Frequency	Percentage
<b>Age (years)</b>		
<25	40	13.8
25-45	173	59.9
>45	76	26.3
<b>Gender</b>		
Male	188	65.1
Female	101	34.9
<b>Educational qualification</b>		
Illiterate	51	17.6
Primary school	61	21.1
Secondary school	76	26.3
Higher secondary school	59	20.4
Graduates and above	42	14.5
<b>Occupation</b>		
Farmers	118	40.8
Government service	49	17
Business	72	24.9
Students	24	8.3
Others*	26	9
<b>Religion</b>		
Christian	269	93.1
Hindu	14	4.8
Others†	6	2.1
<b>Family size</b>		
≤2	15	5.2
3-5	139	48.1
≥6	135	46.7
<b>Monthly income</b>		
<7000	87	30.1
7001-20000	137	47.4
>20000	65	22.5

\*Homemaker and unemployed, †Muslim and Judaism

Majority (93.8%) knew that malaria is caused by mosquito, but only 87.8% knew exactly that it is caused by the bite of mosquito. Maximum of the participants knew that malaria mosquitoes breed in stagnant water (74.7%). Most of the respondents (73.3%) knew malaria causes fever with chill and rigor as the symptoms with only 11.8% saying fever without chill. 67.8% knew that malaria can be prevented with the use of insecticidal treated bed net. 34% of the participants were aware that malaria causing mosquitoes bite at the night time. More than half of the respondent heard of the long-lasting insecticidal bed nets (60.1%) and those who heard about it, maximum of them knew children and women should be given preference to sleep under it (85.6%).

**Table 2: Association between the socio-demographic profile and adequacy of knowledge (n=289).**

Characteristics	Knowledge n(%)		
	Adequate	Inadequate	P value
<b>Age (years)</b>			
<25	12 (30.0)	28 (70.0)	0.370
25-45	48 (27.9)	124 (72.1)	
>45	28 (36.8)	48 (63.2)	
<b>Sex</b>			
Male	57 (30.5)	130 (69.5)	0.970
Female	31 (30.7)	70 (69.3)	
<b>Marital status</b>			
Married	25 (18.2)	112 (81.8)	<0.001
Unmarried	63 (41.7)	88 (58.3)	
<b>Education</b>			
Illiterate	18 (36.0)	32 (64.0)	<0.001
Primary	4 (6.6)	57 (93.4)	
Secondary	23 (30.3)	53 (69.7)	
Higher secondary	21 (35.6)	38 (64.4)	
Graduate	22 (52.4)	20 (47.6)	
<b>Occupation</b>			
Farmer	33 (28.2)	84 (71.8)	0.004
Government service	22 (44.9)	27 (55.1)	
Business	22 (30.6)	50 (69.4)	
Student	10 (41.7)	14 (58.3)	
Others	1 (3.8)	25 (96.2)	
<b>Religion</b>			
Christian	85 (31.7)	183 (68.3)	0.204
Hindu	3 (21.4)	11 (78.6)	
Others	0	6 (100)	
<b>Family size</b>			
1-2	6 (42.9)	8 (57.1)	0.557
3-5	40 (28.8)	99 (71.2)	
>5	42 (31.1)	93 (68.9)	
<b>Monthly income</b>			
<7000	41 (47.1)	46 (52.9)	<0.001
7001-20000	32 (23.5)	104 (76.5)	
>20001	15 (23.1)	50 (76.9)	

79.8% of them were aware that they used the long-lasting bed nets to prevent from malaria. More than half of the respondent knew that LLIN can be washed less than 20 times without losing its effectiveness (60.1%) whereas half of those who heard of LLIN knew that the net is effective up-to 5 years. Most of the participants (67.1%) visited the health centre in case they suffer from fever. Majority (85.5%) clean/cut the bushes in and around their house whereas 77.9% of the participants cleared the stagnant water near the houses. Most of the respondents sleep under the LLIN (71.6%) and 68.5% allowed their family members to sleep under it. More than half of the participants (59.5%) checked for any holes in the net and repaired time to time. Majority (86.9%) used mosquito repellent coils.

**Table 3: Association between the socio-demographic profile, knowledge and attitude (n=289).**

Characteristics	Attitude N (%)		P value
	Favourable	Unfavourable	
<b>Age (years)</b>			
<25	14 (35.0)	26 (65.0)	
25-45	38 (22.0)	135 (78.0)	0.115
>45	24 (31.6)	52 (68.4)	
<b>Sex</b>			
Male	50 (26.6)	138 (73.4)	
Female	26 (25.7)	75 (74.3)	0.875
<b>Marital Status</b>			
Married	29 (21.0)	109 (79.0)	
Unmarried	47 (31.1)	104 (68.9)	0.051
<b>Education</b>			
Illiterate	13 (25.5)	38 (74.5)	
Primary	9 (14.8)	52 (85.2)	
Secondary	23 (30.3)	53 (69.7)	
Higher secondary	19 (32.2)	40 (67.8)	
Graduate	12 (28.6)	30 (71.4)	
<b>Occupation</b>			
Farmer	29 (24.6)	89 (75.4)	
Government service	14 (28.6)	35 (71.4)	
Business	19 (26.4)	53 (73.6)	
Student	8 (33.3)	16 (66.7)	
Others	6 (23.1)	20 (76.9)	
<b>Religion</b>			
Christian	76 (28.3)	193 (71.7)	
Hindu	0	14 (100)	0.01
Others	0	6 (100)	
<b>Family size</b>			
1-2	5 (33.3)	10 (66.7)	
3-5	37 (26.6)	102 (73.4)	
>5	34 (25.2)	101 (74.8)	
<b>Monthly income</b>			
<7000	27 (31.0)	60 (69.0)	
7001-20000	29 (21.2)	108 (78.8)	0.179
>20001	20 (30.8)	45 (69.2)	

Majority of the participants checked the blood for malaria if they suffer for fever (83%). More than half of the participants (58.5%) washed the LLIN. Most of the respondents tucked their LLIN under the mattress while sleeping whereas 18% of them tucked it sometimes and 26% never tucked it under mattress.

There was significant association between adequacy of knowledge and unmarried ( $p<0.001$ ), graduates ( $p<0.001$ ), government servants ( $p=0.004$ ) and those who earned  $<\text{₹}7000$ . There was significant association between christians and favourable attitude ( $p=0.01$ ).

## DISCUSSION

This study was carried out to provide baseline information on knowledge, attitude and practice regarding malaria and LLIN, which can be used in the development of a plan for community participation towards the prevention and control of malaria. Mean age of the participants were  $38.2\pm12.7$  years and majority were male (65.1%), which was similar to the study of Obembe et al.<sup>11</sup> Majority of the population had completed secondary school, which was in contrast to the study of Erhun et al.<sup>12</sup> Most of the participants were farmers (40.8%) and 24.9% do business for the living. Knowledge regarding malaria and LLIN was low among the participants which was in agreement with previous findings of other similar studies.<sup>13,14</sup> The possible reason for having low knowledge was that majority were farmers and low education status. All the participants heard about malaria, which was consistent with study by Hlongwana et al but in contrast to the other studies showed more awareness.<sup>15</sup> The community has good knowledge about causes of malaria which was similar to the few studies.<sup>16,17</sup> Awareness about mode of transmission was good, which was slightly higher than the findings of studies.<sup>12,18,19</sup> This could be due to the awareness given during distribution of the LLIN and most of the participants were in contact with the health system as they visits the facilities if suffer from fever. Majority had knowledge of breeding place of malaria mosquito as stagnant water which was more in comparison to study by Tyagi et al.<sup>20</sup> The association of febrile illness with malaria has been known in India from a long time. Majority knew febrile with chill as the symptoms for malaria (73.3%) which was low in contrast to study done in Eritrea.<sup>21</sup> More than half believed that malaria can be prevented through the use of LLIN while in study also showed that maximum knew LLIN prevents malaria.<sup>21</sup> Only 34% knew that malaria mosquito bite at night which was in contrast to studies done in Nigeria.<sup>2</sup> Most people heard about LLIN. This probably because during the distribution of the LLIN majority of the health workers gave awareness about it. Majority of the respondents claimed children  $<5$  years and mother respectively as a priority groups to sleep under LLINs which is more than the study done by Tomass et al.<sup>4</sup> The study showed low favourable attitude, as people of the region were lack awareness. Over 82% were willing to go hospital in the event of malaria attack and this was consistent with the findings of Erhun et al.<sup>12</sup> In order have effective management of malaria, favorable health seeking behaviour is critical. Majority willing to do blood test if they suspect malaria and nearly 90% believes sleeping under LLIN can prevent them slightly lower than the study findings of Ahmed et al.<sup>22</sup> Misusing of LLIN had been known in other studies like for ripening banana, for covering harvested crops.<sup>4</sup> Only 9.4% were utilizing LLIN for some other purposes like fishing and fencing the gardens etc. Majority visit health centre in the event of fever and more than two-third of them checked for malaria in blood. Not only knowledge and awareness which can contribute to prevention from malaria, it was equally important by reducing the sources to protect oneself from

mosquito bite. Participants cut the bushes and clear the stagnant water by filling it with earth around houses, in order to reduce the mosquito breeding place and this finding was similar to findings of Rakhshani et al.<sup>14</sup> Majority used LLIN to sleep at night and maximum of them preferred their children and pregnant women sleep which was consistent with the finding in Zambia.<sup>16</sup> Nearly 60% checked for holes and repaired them. Holes on the nets were due to improper use and children playing inside it. Many participants used mosquito repellent coils in order to get rid of the mosquito from biting which was more than observation by Vala et al but consistent with the findings of Lover et al.<sup>9,22</sup> Majority (58.5%) washes their LLIN sometimes where other studies<sup>4</sup> also found the similar findings. Most of them tucked the lower edge of the LLINs into the bedding materials while sleeping and this was inconsistent with the report from Ethiopia.<sup>4</sup> Tucking of nets prevent mosquitoes entering inside it through the open spaces and most of them never tuck the nets. By practicing proper use and washing methods of LLINs would contribute to reduce the menace of malaria. There was significant association between unmarried and adequacy of knowledge ( $p<0.001$ ). Most unmarried were educated, so their level of awareness and knowledge were more which was in contrast to study found in Singh et al.<sup>2</sup> There was significant association between graduates and adequacy of knowledge ( $p<0.001$ ). Government servants had more adequate knowledge and this was statistically significant ( $p$ -value=0.004). There was significant association between who earned  $<\text{₹}7000$  and adequacy of knowledge, as most of those who earn were students and more educated. The limitations in this study were that knowledge questions did not include domains like source of information, treatment, home remedy, number of LLIN in the household, complication etc. Questionnaire was not validated. Questionnaire did not have the reason for not using LLIN, as this could have thrown a light on the barrier to ownership and effectiveness of awareness programme.

## CONCLUSION

We concluded that one-third and one-fourth of the participants had adequate knowledge and favourable attitudes respectively, towards the malaria and LLIN. There was significant association between marital status, educational qualification, occupation and monthly income with adequacy of knowledge, and between religion and attitude. Further research on malaria and LLIN by including the domains like source of information, treatment of malaria, home remedy, number of LLIN in the household, complication of malaria and reason for not using LLIN.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Marak RC, Singh TA. Community knowledge, attitude and practices regarding malaria and long-lasting insecticidal nets (LLIN) in Churachandpur, Manipur. *Int J Community Med Public Health* 2021;8:3064-9.