Knowledge, Attitudes, and Treatment Seeking Behavior about Malaria and Its Control among Patients Attending Fever Clinic in a Tertiary Care Hospital of Eastern India

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Abstract

Background: Malaria continues to be a serious public health problem in South-East Asia including India. We assessed knowledge, attitudes, recognition of signs and symptoms and treatment seeking behavior about malaria and its control in patients with fever attending fever clinic at tertiary care hospital, Kolkata, India. Material and Methods: A cross-sectional questionnaire based survey was done in patients attending fever clinic. A total of (n = 68) patients with fever were interviewed using standardized questionnaire. Results: A total of 68 subjects were interviewed, including 19 (27.94%) females and 49 (72.06%) males. Mean age was 39.8 ± 17.2 years (18–78). About 5 (7.35%) were illiterate. All of the study participants had heard of malaria. The most common response on the source of information regarding malaria was radio (32.35%) followed by TV (29.41%) and friends (26.47%). About 52.94% replied that malaria can be prevented. Approx 39.7% subjects informed that fever plus chills are the most clinical features of malaria, followed by (fever+ chills + bodyache) in 32.35% cases. The most common response on the source of information regarding malaria transmission by mosquito bite was in 92.65% cases. Knowledge about breeding places of mosquitoes was informed as dirty stagnant water by 47.06%. Conclusions: Greater awareness about malaria and undertaking a broader range of preventive actions for malaria influence appropriate treatment-seeking behaviour. This study was conducted to understand issues, which can be an important step towards developing strategies, aimed at controlling malaria. The positive attitudes and practices in relation to personal protection and prevention measures against malaria require marked improvement.

Keywords: Malaria, Knowledge, Attitude, Treatment seeking, Eastern India

Introduction

Malaria is a major public health problem in India causing an enormous burden to health and economy. In 2016, an estimated 216 million cases of malaria occurred worldwide (95% confidence interval [CI]: 196–263 million), compared with 237 million cases in 2010 (95% CI: 218–278 million) and 211 million cases in 2015 (95% CI: 192–257 million). Despite substantial reductions, between 2014 and 2016, substantial increases in case incidence occurred in the WHO Region of the Americas, and marginally in the WHO South-East Asia, Western Pacific and African regions.¹ Malaria is a public health problem in several parts of the country. About 95% population in the country resides in malaria endemic areas and 80% of malaria reported in the country is confined to areas consisting 20% of population residing in tribal, hilly, difficult and inaccessible areas.² In India, about 1.31 million malaria cases with 753 deaths were reported in the year 2011 out of which more than half cases were of Plasmodium falciparum.³; the actual number of cases may be much more than the number of confirmed cases reported by National Malaria Control Programmes.⁴ Jharkhand and Bihar are malaria endemic states and under the Enhanced Malaria Control Project (EMCP) funded by the World Bank from 1997⁵ and contributes about twelve percent of the total malaria cases.

Malaria is a unique disease and has roots deep within human communities. There have been a considerable number of reports about knowledge, attitudes, and practices relating to malaria and its control from different parts of South East Asia. These reports concluded that misconceptions concerning malaria still exist and that practices for the control of malaria have been unsatisfactory. Thus, an advanced knowledge of the community beliefs and practices with respect to the disease is required to obtain and maintain its participation in surveillance and control activities.⁶ Beliefs and practices of malaria are often related to culture which can influence the effectiveness of control strategies.⁷ Thus, local knowledge, attitudes and practices related to the disease are key to implementation of culturally appropriate, sustainable, and effective interventions.⁸ Community perception, beliefs, and attitude about malaria control, symptom identification, treatment, and prevention...
influence efforts to address malaria and are often overlooked in control efforts;[9] and vary from country to country and among individual households.[10] Failure to consider community’s knowledge, attitude, and practice (KAP) about malaria may contribute to the inability of the program to achieve sustainable control.[11,12] The objective was to collect baseline information concerning knowledge, attitudes, and practices of people in the study area regarding malaria among patients attending fever clinic of a tertiary care teaching hospital, Kolkata.

Materials & Methods

The study was conducted from May to October 2014 in patients attending a dedicated fever clinic in a tertiary care teaching hospital. The study was a hospital based cross-sectional study. A structured questionnaire was used for interview. The questionnaire was administered to 100 randomly selected fever patients and 68 subjects who completed the complete interview were considered for final analysis. The first part of the questionnaire included demographic characteristic, whereas the second part had questions on knowledge, attitude and practices of residents about malaria, symptoms of malaria, transmission, protection methods of malaria, malaria vectors, and mosquito breeding, resting places, refusal of DDT spray and regular use of ITNs for malaria control etc. The questionnaire was prepared in English language but translated and communicated in local languages when necessary. Full verbal explanation of the study was given to members of selected patients or accompanying person with the fever patients and consent was obtained before inclusion as participants. Privacy and confidentiality were maintained throughout the study. The data were entered into a Microsoft Excel - Worksheet and analyzed using Epi Info, version 3.5.3. Descriptive statistics were carried out to measure relative frequencies, percentages, averages, and relative frequencies of the variables. Ethical clearance to conduct this study was obtained.

Results

A total of 68 subjects were interviewed, including 19 (27.94%) females and 49 (72.06%) males (Table 1). Mean age was 39.8 ± 17.2 years (18-78). About 5 (7.35%) were illiterate. Majority of the participants 39.71% was 16-30 yrs followed by 38.23% of 31-45 yrs. Majority of the subjects were from upper lower socioeconomic class 92.65% followed by lower middle (4.41%) and upper middle (13.23%). None of the participants attended the Government fever clinic belong to upper middle or socioeconomic class 92.65% followed by lower middle (4.41%) of 45 yrs. Majority of the subjects were from upper lower socioeconomic class 92.65% followed by lower middle (4.41%) and lower (2.94%). None of the participants attended the Government fever clinic belong to upper middle or upper class. Detailed socio-demographic characteristics are presented in Table 1.

Table 1: Socio-economic profile of study population

| Socio-Economic Background | Age in years | Frequency | Percentage |
|---------------------------|--------------|-----------|------------|
|                           | <15          | 0         | 0          |
|                           | 16-30        | 27        | 39.71      |
|                           | 31-45        | 26        | 38.23      |
|                           | 46-60        | 13        | 19.12      |
|                           | >60          | 2         | 2.94       |
|                           | Socio-economic scale (according to Kuppuswamy’s socio-economic scale 2012) |          |            |

Table 2: Knowledge about malaria among study participants

| Have you heard about malaria before? | Frequency | Percentage |
|--------------------------------------|-----------|------------|
| No                                   | 0         | 0          |
| Yes                                  | 68        | 100        |

| If yes, from where? | Frequency | Percentage |
|---------------------|-----------|------------|
| Friends             | 18        | 26.47      |
| TV                  | 20        | 29.41      |
| Community Health Worker | 9       | 13.23      |
| Family Members      | 17        | 25         |
| School              | 0         | 0          |
| Malaria Camp        | 0         | 0          |
| Posters/Pamphlets   | 0         | 0          |
| Religious Meeting   | 1         | 1.47       |
| Health Camp         | 3         | 4.41       |
| Newspapers          | 11        | 16.18      |
| Community Meetings  | 2         | 2.94       |
| Radio               | 22        | 32.35      |
| Health Facility     | 9         | 13.23      |
| Others              | 0         | 0          |
| Not Applicable      | 6         | 8.82       |

Knowledge about symptoms of malaria

| Fever + Chills        | Frequency | Percentage |
|-----------------------|-----------|------------|
| Fever + Chills + Bodyache | 27    | 39.7      |
| Fever + Chills + Bodyache + | 22   | 32.35     |
| Headache              | 16        | 23.53      |

Knowledge about malaria transmission

| Mosquito Bite         | Frequency | Percentage |
|-----------------------|-----------|------------|
| By Flies              | 1         | 1.47       |
| Contaminated Water    | 2         | 2.94       |
| Chill Climate         | 1         | 1.47       |
| Malnutrition          | 1         | 1.47       |
| Eating Raw Vegetable  | 0         | 0          |
| Any Other             | 0         | 0          |
| No Comments           | 5         | 7.35       |

Knowledge about breeding places of mosquitoes

| Dirty Stagnant Water | Frequency | Percentage |
|---------------------|-----------|------------|
| Due To Poor Personal Hygiene | 6     | 8.82      |
| Flower Pots         | 0         | 0          |
| Coolers             | 0         | 0          |
| Air                 | 0         | 0          |
| No Idea             | 31        | 45.59      |
| No Comments         | 2         | 2.94       |

Knowledge about what diseases are transmitted by mosquitoes

| Dengue              | Frequency | Percentage |
|---------------------|-----------|------------|
| Malaria             | 31        | 45.59      |
| Dengue + Malaria    | 30        | 44.12      |

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Diarrhoea 0 0
Typhoid 0 0
No Idea 3 4.41
No Comments 2 2.94

Knowledge about preventive measures of malaria
Mosquito Nets 33 48.53
Use Of Fans 5 7.35
All The Above + Proper Clothing 7 10.29
All The Above + Avoid Water Collection 8 11.76
Check For Mosquito Breeders In Coolers 2 2.94
Check For Mosquito Breeders In Flower Pots 0 0
Last Two Options+ Check Tyres For Mosquito Breeding 0 0
No Comments 20 29.41

Any knowledge about self protection from mosquito bites?
Mats 9 13.23
Coils 9 13.23
Bednets 47 69.12
Fans 13 19.12
Others (Fire/Smoke) 2 2.94
No Comments 12 17.65

All of the study participants had heard of malaria [Table 2]. The response to questions on knowledge with multiple options drew multiple responses. However, the most common response on the source of information regarding malaria was radio (32.35%) followed by TV (29.41%) and friends (26.47%). Very little information about malaria was originated from malaria camp, and religious meeting. About 52.94% replied that malaria can be prevented. Approx 39.7% subjects informed that fever plus chills are the most clinical features of malaria, followed by (fever+ chills + bodyache) in 32.35% cases. The most common response on the source of information regarding malaria transmission by mosquito bite was in 92.65% cases. Knowledge about breeding places of mosquitoes was informed as dirty stagnant water by 47.06%. Knowledge about preventive measures of malaria by mosquito nets was in 48.53% cases. Knowledge about self protection from mosquito bites by bed net was reported 69.12% [Table 2]. Idea about what diseases are transmitted by mosquitoes was reported by 45.59% participants. About 44.12% of the subjects reported that they are aware that dengue and malaria are mosquito borne diseases. By using mosquito nets alone 48.53% reported that malaria can be prevented. About 11.76% reported by avoiding water collection in addition malaria can be prevented. Only 2.94% stressed upon “check for mosquito breeders in coolers” to avoid malaria parasite growth [Table 2]. As reported by participants self protection from mosquito bites may be done by bednets, fan, coils, and mosquito mat by 69.12%, 19.12%, 13.23% and 13.23% respectively.

Table 3: Treatment seeking behavior among study participants

| Duration of suffering from fever | Frequency | Percentage |
|---------------------------------|-----------|------------|
| 1 day                           | 6         | 8.82       |
| 2 days                          | 15        | 22.06      |
| 3 days                          | 24        | 35.29      |
| 4 days/ more                    | 23        | 33.82      |

Pattern of fever
Fever Continuous 6 8.82
Fever Remittent 41 60.29
Fever Intermittent 19 27.94
Don’t Know 2 2.94

Present complaints
Fever 67 98.53
Chills 59 86.76
Yellow Eyes 1 1.47
Headache 59 86.76
Bodyache 56 82.35
Nausea 19 27.94
Vomiting 14 20.59
Anemia/Pale Looking 0 0
Generalized Weakness 22 32.35
Yellowish Urine 13 19.12
Loss of Appetite 39 57.35
Diarrhea 0 0
Constipation 0 0
Convulsion 0 0
Others 16 23.53

First action taken in case of fever
Home Remedy 2 2.94
Self Medication 6 8.82
Went to a Doctor/ Hospital 37 54.41
Went to a Chemist For Medication 20 29.41
Went to Quack 1 1.47
No Response 1 1.47

Delay in seeking treatment from medical care provider after the onset of fever
Same Day 18 26.47
Next Day 33 48.53
Day After Next 5 7.35
More Than 2 Days 12 17.65
Later 0 0

Reason for not seeking treatment for this illness
Not Severe Enough 38 55.88
Got Better 0 0
Home Remedy 2 2.94
Tried Self Medication 10 14.7
Not Enough Money 5 7.35
Too Far Away 0 0
No Transport 0 0
Family Would Not Let Me 2 2.94
Others 17 25

Most important reason for choosing this medical care provider/ Govt hospital
Proximity 51 75
Good Reputation 52 76.47
Inexpensive 22 32.35
Good Personal Experience 10 14.7
Qualified Staff 1 1.47
Freely Available Drugs 30 44.12
Relative/Friend Works Here 4 5.88
Can Get Treatment on Credit 0 0
Others 0 0

Distance from the care provider
>10 km 2 2.94
5-10 km 7 10.29
1-4 km 54 79.41
<1 km 5 7.35
### Indexcopernicus value - 64.48

#### Mode of transport to the care provider

| Mode of transport to the care provider | Walk | Bicycle | Motorcycle | Private Car | Public Taxi/Bus | Metro/Train | Auto | Others |
|--------------------------------------|------|---------|------------|-------------|----------------|-------------|------|--------|
| Walk                                 | 51   | 0       | 0          | 0           | 13             | 1           | 2    | 1      |
| Bicycle                              | 0    | 0       | 0          | 0           | 0              | 0           | 0    | 0      |
| Motorcycle                           | 3    | 4.41    | 0          | 0           | 0              | 1.47        | 2.94 | 1.47   |
| Private Car                          | 0    | 0       | 0          | 0           | 0              | 0           | 0    | 0      |
| Public Taxi/Bus                      | 13   | 19.12   | 0          | 0           | 0              | 1.47        | 2.94 | 1.47   |
| Metro/Train                          | 1    | 1.47    | 0          | 0           | 0              | 0           | 0    | 0      |
| Auto                                 | 2    | 2.94    | 0          | 0           | 0              | 0           | 0    | 0      |
| Others                               | 1    | 1.47    | 0          | 0           | 0              | 0           | 0    | 0      |

#### Whom did you consult at this facility

| Whom did you consult at this facility | Doctor | Nurse | Pharmacist | Lab Technician | Traditional Healer | Others |
|--------------------------------------|--------|-------|------------|----------------|--------------------|--------|
| Doctor                               | 66     | 0     | 23         | 50             | 0                  | 0      |
| Nurse                                | 0      | 0     | 0          | 0              | 0                  | 0      |
| Pharmacist                           | 23     | 33.82 | 0          | 73.53          | 0                  | 0      |
| Lab Technician                       | 50     | 73.53 | 0          | 0              | 0                  | 0      |
| Traditional Healer                   | 0      | 0     | 0          | 0              | 0                  | 0      |
| Others                               | 0      | 0     | 0          | 0              | 0                  | 0      |

#### Duration of admission to the facility for fever

| Duration of admission to the facility for fever | 3 | 7 | 10.29 |
|-------------------------------------------------|---|---|-------|
| No. of Night Stay                               | 2 | 0 | 0     |
| 1                                               | 0 | 0 | 0     |
| 0                                               | 61| 81.71| |

#### Test recommended

| Test recommended | Rapid Diagnostic Test (RDT) | Microscopy | Both RDT and Microscopy |
|------------------|-----------------------------|------------|-------------------------|
| Advised and had test | 67 | 98.53 | |
| Advised but declined | 0 | 0 | |
| No advice, but test | 0 | 0 | |
| No advice, but had test | 1 | 1.47 | |

#### Test result

| Test result | Positive | 68 | 100 |
|-------------|----------|----|-----|
| Negative    | 0        | 0  |     |
| Don’t Know  | 0        | 0  |     |

#### Type of malaria infection detected in test report

| Type of malaria infection detected in test report | P. Falciparum | 21 | 30.88 |
|--------------------------------------------------|---------------|----|-------|
| P. Vivax                                         | 47            | 69.12| |
| P. Malaria                                       | 0             | 0   |     |
| P. Ovale                                         | 0             | 0   |     |
| P. Knowlesi                                      | 0             | 0   |     |
| Mixed Infection                                  | 0             | 0   |     |
| Don’t Know                                       | 0             | 0   |     |

#### Receipt of medicine or prescription from this facility

| Receipt of medicine or prescription from this facility | Received medicine | 68 | 100 |
|-------------------------------------------------------|-------------------|----|-----|
| Received prescription                                | 5                 | 7.35| |
| No, did not receive                                  | 0                 | 0   |     |
| Medicine/Prescription                                | 0                 | 0   |     |
| Don’t know                                           | 0                 | 0   |     |

#### Treatment regimen followed

| Treatment regimen followed | Artesunate (50mg) + Sulfadoxine (500mg) + Pyrimethamine (25mg) | 13 | 19.12 |
|---------------------------|-----------------------------------------------------------------|----|-------|
|                           | Sulfadoxine (500mg) + Pyrimethamine (25mg)                      | 2  | 2.94  |
|                           | Artesunate (50mg) + Sulfadoxine (500mg) + Pyrimethamine (25mg) + Primaquine Phosphate | 6  | 8.82  |

#### Chloroquine (250mg) 47 69.12

### Clinical Presentation

In more than 35.29% of the subjects with fever seeking treatment outside the home by 3 days followed by 33.82% by 4 days or more. Pattern of fever was found to be mainly remittent (60.29%), followed by intermittent (27.94%) and continuous (8.82%) [Table 3]. Chief clinical presentations were mainly fever (98.53%), chills (86.76%), headache (86.76%) and bodyache (82.35%). Loss of appetite (57.35%), nausea (27.94), vomiting (20.59%), and generalized weakness (32.35%) were less commonly reported problems in patients with fever. None of the participants had reported anemia or pale looking, diarrhea, constipation or convulsion ever experienced during current fever attack. Majority of the subjects 54.41% went to doctor whenever fever was troublesome, followed by 29.41% first went to local chemist for medication. Few cases they tried home remedy (2.94%), went to quack (1.47%) or tried self medication 8.82%. Some respondents, however, indicated that they resort to other treatment choices outside the home, when the first action at home fails.

Delay in seeking treatment from medical care provider after the onset of fever was observed next day (48.53%) followed by same day (26.47%) and more than 2 days (17.65%). Respondents had reported main reasons for not seeking treatment for fever are “not severe enough” (55.88%), ‘tried self medication’ 14.7%, and ‘not enough money’ 7.35%, about 25% respondents did mentioned other reasons for delaying treatment. Respondents reported the most important reasons for choosing this medical care provider/ Govt hospital are ‘good reputation’ 76.47%, ‘proximity of health clinic’ 75%, ‘freely available drugs’ 44.12% and ‘inexpensive’ 32.35%. On an average 1-4 km respondents had to travel for seeking treatment in 79.41%. About 10.29% cases they had travelled almost 5-10 km for seeking low cost better treatment facilities. Majority of subjects travelled to fever clinic by walk and public bus. Approximately 97.06% cases participants had consulted doctor at fever clinic followed by lab technician 73.53% for blood reports and 33.82% cases with pharmacists. Majority of respondents 81.71% did not get admitted with fever. Only 10.29% cases subjects got admitted in the hospital with an average of 3 night stay.

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About 98.53% cases blood test was advised with the history of fever patients attending fever clinic. About 98.53% microscopy of peripheral smear for malaria parasite was advised and based on report outcome treatment was served. In all most all cases in the present series were positive for malaria parasite. P. vivax was much common among present fever cases 69.12% followed by p. falciparum 30.88%. All the respondents or subjects with fever were prescribed medicine free of charges from fever clinic. Chloroquine was prescribed among 69.12% followed by 19.12% cases [Artesunate (50mg) + Sulfadoxine (500mg) + Pyrimethamine (25mg)] combination therapy. Only a few cases 2.94% [Sulfadoxine (500mg) + Pyrimethamine (25mg)] were prescribed and dispensed. About 95.59% cases health care professionals properly explained how drugs to be taken.

About 52.94% cases advised for follow up. As reported by respondents’ 42.65% cases respondents had similar fever attack more than 1 yr back. Only 2.94% cases there was history of repeated fever. About 41.18% cases took antimalarial treatment by more than one year back. About 7.35% cases they had antimalarial treatment within 3 months, which showed some had history of repeated attack of malaria infection [Table 3].

Discussion

Community knowledge, attitudes and practices relating to causation, transmission, prevention and treatment are key factors influencing malaria prevention and control. Results from surveys on knowledge, attitudes, and practices are applicable to design or improve malaria control programs, and to identify indicators for a program’s effectiveness.[8] All of the study participants had heard of malaria which is same as RK Gupta et al (2016). [12]

Study by Singh R et al had shown that about 180 (90.0%) of the respondents reported any bed nets as the most common known protective method against malaria, while 128 (64.0%) respondent had knowledge of insecticide treated bed net (ITNs). Second most common known preventive measure was use of mosquito coils by 79 (37.8%) respondent. The knowledge of ways to prevent mosquito breeding, by cleaning of house surroundings was reported by 97 (48.5%) and draining of stagnant water by 58 (29.0%). Knowledge of the role of mosquitoes in malaria transmission (11.8%) and cause of malaria (9.6%) was observed to be low among the study population. Comprehensive knowledge about malaria prevention measures was high (90%), but not reflecting in their practice (16%). They have good knowledge of mosquito behavior (breeding areas (64.5%), resting places (70%) and biting time (81%)). Seeking hospital care for a febrile child was a good practice (68.5%) observed. Attitudes regarding the best antimalarial therapy was limited (56.7%) to chloroquine. [13]

Study by Vijayakumar KN et al8 showed about 63% of the respondents mentioned mosquito bite as the cause for this disease and 65% considered malaria as a serious problem. Qualitative data 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.

In this study, the majority of respondents reported to have heard of the chloroquine therapy, artemether combination therapy for treatment of malaria. An encouraging finding of Singh R et al13 study revealed that only 8% of respondent mentioned traditional healer as a choice of treatment, which was consistent with previous study in Nigeria.[14] We found that almost all participants seek treatment for malaria from healthcare facilities, with more than half seeking treatment within 24 h of presenting with symptoms. Regarding the adoption of personal precautionary measures by participants in Sami Khairy et al study.[15] mosquito nets were the most commonly used protective equipment, followed by anti-mosquito sprays (47.3% and 29.8%, respectively). Greater awareness about malaria and undertaking a broader range of preventive actions for malaria influence appropriate treatment-seeking behavior. A study in Cambodia showed that early recognition of malaria symptoms is the first important step to treatment seeking[16] Study by Thandar et al.[17] revealed caregivers were aware of malaria symptoms, about 50% were unaware that children under five and pregnant mothers are especially vulnerable to malaria.

The findings clearly demonstrate that the majority of the respondents had adequate knowledge and desirable health seeking-behavior; still a sizable proportion had misconception of the cause of malaria. 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. [18] Community Knowledge on malaria prevention and control options is important and the effort is related to either to environmental management, personal protection or vector control. Study by Zewdie Aderaw et al [19] revealed that unconsciousness (28.3%), seizure/convulsion (24.4%) and vomiting (16%) were most frequently mentioned signs and symptoms of server malaria. This finding was supported by a study done in Myanmar which reported unconsciousness and convulsion are most frequently mentioned signs and symptoms of malaria. [20]

Study by Singh RK et al revealed that the awareness of malaria and its symptoms and transmission was very high (100%) among the population with higher economic group and was significantly different (p<0.05) from the low economic group. Similarly the perception that malaria can be prevented and is transmitted by mosquitoes was much higher than those with lower economic group (p<0.05). [21]

Conclusion

Greater awareness about malaria and undertaking a broader range of preventive actions for malaria influence appropriate treatment-seeking behaviour. Local knowledge and practice related to malaria is important for the implementation of culturally appropriate, sustainable and effective interventions. The findings of this study indicate that urban communities in Kolkata, West Bengal have high knowledge on malaria transmission, symptoms, and preventive measures. However, low education was detected as a major drawback for effective control, and intervention measures and information campaigns should focus on this high risk group. Increasing the knowledge about malaria transmission and benefits of using available effective preventive and control measures by the individual households and the community could contribute much to the overall reduction of the malaria burden. The obvious gap between the knowledge and practice related to malaria prevention requires innovative strategies based on local evidence that well suits the local circumstances to promote and encourage the
adoption and practice of personal protective measures. Most of the respondents had an acceptable level of knowledge and awareness about malaria, and indicated that they would seek treatment quickly if they developed symptoms.

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