Original Research Article

Knowledge, attitude and practices regarding malaria among residents of rural Mangalore, India

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ABSTRACT

Background: Malaria is one of the most prevalent parasitic diseases worldwide and India has fourth highest number of malaria cases and deaths in the world. Prevention of the disease through better knowledge and awareness is the appropriate way to keep the disease away and remain healthy. Thus, the present study was aimed to assess the knowledge, attitude and practices regarding malaria among residents of Mangalore.

Methods: Community based cross sectional study was conducted among residents in Mangalore. The data was collected by using pre-tested semi-structured questionnaire which include socio-demographic data, basic knowledge about malaria, transmission and preventive measures and health seeking behaviour regarding malaria through interview method.

Results: Almost 98.4% respondents heard of malaria disease and 96% respondents had knowledge that malaria is caused by mosquito bite. Even, majority (72%) of respondents knew that malaria can be fatal. Regarding the symptoms of malaria, 52.4% respondents mentioned fever with chills and 11.6% respondents don’t know about malarial symptoms.

Conclusions: Majority of the respondents were familiar with the malaria symptoms, mode of transmission and vector control measures. They had good knowledge of malaria disease and good practices of malaria control measures.

Keywords: Fever, IRS, KAP, Malaria

INTRODUCTION

Malaria is one of the most prevalent and widespread parasitic diseases in the world with an estimated of 216 million cases in 2016.1,2 In Southeast Asia region, India contributes around 70% of total malarial cases and about 82% of the population are at risk of malaria infection.3,4 According to WHO Malaria Report, India has fourth highest number of malaria cases and deaths in the world.2 Malaria is highly endemic in Southern region of India, mostly in coastal area of Karnataka throughout the year.5 Mangalore, a city in southwest coastal region of Karnataka, considered to be one of the highly endemic place for malaria with 2.92 Annual Parasitic Index.6 Early case finding and treatment, vector control measures are some of the important strategies of Malaria control under National Vector Borne Disease Control Programme (NVBDCP).7 But some of the beliefs, customs and practices of malaria, are often related to culture, which can influence the effectiveness of malaria control strategies.8

Prevention of the disease through better knowledge and awareness is the appropriate way to keep the disease away and remain healthy. Studies pertaining to knowledge, attitude and practices showed that direct interaction with community plays an important role in circumventing malaria problem.9,10 Community beliefs,
perception, and attitude towards malaria symptom identification, treatment, prevention and control can influence efforts to address malaria and are often overlooked in control efforts.\textsuperscript{10,11} Thus, the present study was done to assess the knowledge, attitude and practices regarding malarial transmission and health seeking behaviour.

**METHODS**

A community based cross sectional study was carried out in Pavanje village, which comes under Mangalore Taluka of Dakshina Kannada district. The study was conducted for a period of 45 days from 15\textsuperscript{th} May to 30\textsuperscript{th} June 2018. The study population was all the houses in Pavanje village. House to house visit was done and adult family member (head of the house hold or senior family member) present at the time of visit was interviewed in local language (Kannada) for collection of information regarding malaria. Only one family member per household was included in this study and the purpose of the study was enlightened to the respondent. The locked house or non-responsive respondents and children were excluded from the study. Informed written consent was taken from all respondents and confidentiality was ensured throughout the study.

The data was collected by using pre-tested semi-structured questionnaire which had two parts. The first part of the questionnaire included socio-demographic characteristics like age, gender, education, socio-economic status. The second part of the questionnaire included knowledge, attitude and practices of residents about malaria in respect to symptoms, malaria transmission, resting places and biting time of mosquito, treatment of malaria, preventive measures of malaria and health seeking behaviour of malaria prevention.

After obtaining the information from the respondents, the health education regarding malaria prevention and transmission was given to every family member in the house irrespective of their knowledge regarding malaria.

**Statistical analysis**

The data was entered and tabulated in Microsoft Excel sheet and was analyzed using statistical software (SPSS trial version).

**RESULTS**

A total of 250 respondents were enrolled in the study, out of which 148 (59.2\%) and 102 (40.8\%) were male and female respectively. The maximum respondents were in the age group of 21-30 years (29.2\%) and educated till graduation (32.8\%) (Table 1).

Almost 98.4\% respondents heard of malaria disease and 14.8\% respondents had malaria in the past. Around 96\% respondents had knowledge that malaria is caused by mosquito bite and 94\% respondents knew that malaria can be prevented. Even, majority (72\%) of respondents knew that malaria can be fatal. Regarding the symptoms of malaria, 131 (52.4\%) respondents mentioned fever with chills and 29 (11.6\%) respondents don’t know about malarial symptoms. Majority (79.2\%) of respondents knew that the resting place for mosquito is stagnant water. The source of information regarding malaria was TV (45.6\%) followed by hospital (22.4\%) (Table 2).

| Characteristic | Frequency (%) |
|---------------|--------------|
| **Age (years)** |              |
| <20           | 27 (10.8\%)  |
| 21-30         | 73 (29.2\%)  |
| 31-40         | 47 (18.2\%)  |
| 41-50         | 53 (21.2\%)  |
| >50           | 50 (10.0\%)  |
| **Gender**    |              |
| Male          | 148 (59.2\%) |
| Female        | 102 (40.8\%) |
| **Religion**  |              |
| Hindu         | 206 (82.4\%) |
| Christian     | 27 (10.8\%)  |
| Muslim        | 17 (6.8\%)   |
| **Education** |              |
| Primary       | 11 (4.4\%)   |
| Upper Primary | 42 (16.8\%)  |
| Secondary     | 70 (28.0\%)  |
| Senior Secondary | 38 (15.2\%) |
| Diploma       | 6 (2.4\%)    |
| Graduate      | 82 (32.8\%)  |
| Post Graduate | 1 (0.4\%)    |
| **Diet**      |              |
| Vegetarian    | 44 (17.6\%)  |
| Mixed         | 206 (82.4\%) |
| **Socio economic status** | |
| Class 1       | 12 (4.8\%)   |
| Class 2       | 117 (46.8\%) |
| Class 3       | 72 (28.8\%)  |
| Class 4       | 5 (2.0\%)    |
| Class 5       | 44 (17.6\%)  |

Majority of respondents (80.4\%) considered that malaria is a serious health problem and almost 90.4\% respondents had positive attitude towards vector control measures. The attitude towards diagnosis and treatment of malaria was adequate among maximum respondents (Table 3).

Maximum (69.6\%) of the respondents were not using bed nets and 86.4\% respondent had a habit of cleaning their surrounding regularly. Majority of the respondents (65.2\%) were using mosquito replants like all out or coils followed by window mesh or nets (29.2\%) (Table 4).
DISCUSSION

The aim of the study was to assess the knowledge, attitude and practices of malaria transmission and prevention. KAP assessment is the initial as well as crucial steps of planning and implementation of health programme. It also helps to develop cost effective behavioural changes strategy in the community regarding malaria control. In this study, the knowledge about malaria was quite good. Majority of the study respondents heard of malaria and knew that malaria can be prevented, and it can become fatal, if untreated. The similar finding was found in the study done by Gupta RK et al.12

| Question                                                                 | Response                                                                 | Frequency (%) |
|--------------------------------------------------------------------------|--------------------------------------------------------------------------|---------------|
| Have you heard of malaria?                                               | Yes                                                                      | 246 (98.4%)   |
|                                                                          | No                                                                       | 4 (1.6%)      |
| Have you suffered from malaria?                                          | Yes                                                                      | 37 (14.8%)    |
|                                                                          | No                                                                       | 213 (85.2%)   |
| Is malaria caused by mosquito bite?                                      | Yes                                                                      | 240 (96%)     |
|                                                                          | No                                                                       | 10 (4%)       |
| Malaria can be prevented?                                                | Yes                                                                      | 235 (94%)     |
|                                                                          | No                                                                       | 15 (6%)       |
| Can malaria cause death?                                                 | Yes                                                                      | 180 (72%)     |
|                                                                          | No                                                                       | 70 (28%)      |
| Have you seen any health workers spraying around your house?             | Yes                                                                      | 159 (63.6%)   |
|                                                                          | No                                                                       | 91 (36.4%)    |
| Malaria symptoms                                                          | Fever with chills                                                        | 131 (52.4%)   |
|                                                                          | Body pains                                                              | 5 (2%)        |
|                                                                          | Fever with sweats                                                        | 3 (1.2%)      |
|                                                                          | Fever with chills and loss of appetite                                   | 15 (6%)       |
|                                                                          | Fever with chills, loss of appetite and body pain                        | 12 (4.8%)     |
|                                                                          | Fever with chills and body pain                                          | 27 (10.8%)    |
|                                                                          | Fever with chills, sweats and body pain                                  | 13 (5.2%)     |
|                                                                          | Don’t know                                                              | 29 (11.6%)    |
| Do you know when mosquito bites?                                         | Day                                                                      | 52 (20.8%)    |
|                                                                          | Night                                                                    | 126 (50.4%)   |
|                                                                          | Day and night                                                           | 6 (2.4%)      |
|                                                                          | Anytime                                                                 | 42 (16.8%)    |
|                                                                          | Don’t know                                                              | 24 (9.6%)     |
|                                                                          | Stagnant water                                                          | 198 (79.2%)   |
|                                                                          | Bushes/grass                                                            | 23 (9.2%)     |
|                                                                          | Stagnant water and bushes/grass                                         | 13 (5.2%)     |
|                                                                          | Don’t know                                                              | 16 (6.4%)     |
| Resting places of mosquitoes?                                            | Rainy                                                                    | 202 (80.8%)   |
|                                                                          | Winter                                                                   | 2 (0.8%)      |
|                                                                          | Summer                                                                  | 12 (4.8%)     |
|                                                                          | Anytime                                                                 | 32 (12.8%)    |
| Transmission season of malaria?                                          | Environmental management                                                | 169 (67.6%)   |
|                                                                          | Environmental management and insecticide treated bed nets               | 26 (10.4%)    |
|                                                                          | Insecticide treated bed nets                                            | 21 (8.4%)     |
|                                                                          | Don’t know                                                              | 25 (10%)      |
| Prevention of malaria                                                    | TV                                                                       | 114 (45.6%)   |
|                                                                          | Friends/ neighbors                                                      | 26 (10.4%)    |
|                                                                          | Newspaper                                                               | 17 (6.8%)     |
|                                                                          | Hospital                                                                 | 56 (22.4%)    |
| Source of information about malaria                                      | Health workers                                                          | 30 (12%)      |

Table 2: Knowledge regarding malaria among study population.
**Table 3: Attitude regarding malaria treatment among study population.**

| Questions                                      | Response | Frequency (%) |
|------------------------------------------------|----------|---------------|
| Is malaria one of the serious health problems? | Yes      | 201 (80.4%)   |
|                                                | No       | 49 (19.6%)    |
| Is your attitude towards vector control positive? | Yes      | 226 (90.4%)   |
|                                                | No       | 24 (9.6%)     |
| Do you allow health workers to take blood samples? | Yes      | 172 (68.8%)   |
|                                                | No       | 78 (31.2%)    |
| Your first action if your family member has fever? | Consult a doctor | 198 (79.2%) |
|                                                | Traditional healer | 8 (3.2%)    |
|                                                | Home treatment | 39 (15.6%)    |
|                                                | Do nothing | 8 (3.2%)      |
| Deciding factor in seeking treatment when child/family member has fever? | Condition of the child/family member | 211 (84.4%) |
|                                                | Time availability | 19 (7.6%)  |
|                                                | Cost involved | 14 (5.6%)     |
| Treatment for malaria?                         | Chloroquine | 26 (10.4%)   |
|                                                | Paracetamol | 32 (12.8%)    |
|                                                | Chloroquine and paracetamol | 8 (3.2%)   |
|                                                | Don’t know | 184 (73.6%)   |

**Table 4: Practices regarding malaria prevention and treatment among study population.**

| Questions                                      | Response | Frequency (%) |
|------------------------------------------------|----------|---------------|
| Do you use bed nets?                           | Yes      | 76 (30.4%)    |
|                                                | No       | 174 (69.6%)   |
| Do you keep the malaria infected person separate? | Yes      | 82 (32.8%)    |
|                                                | No       | 168 (67.2%)   |
| Any dietary restrictions to a person who has malaria? | Yes      | 118 (47.2%)   |
|                                                | No       | 132 (52.4%)   |
| Do you regularly clean your surroundings?      | Yes      | 216 (86.4%)   |
|                                                | No       | 34 (13.6%)    |
| Which of these mosquito control methods do you follow? | Biological | 31 (12.4%) |
|                                                | Window Mesh/ bed nets | 73 (29.2%) |
|                                                | DDT spray | 16 (6.4%)    |
|                                                | Coils/All out | 163 (65.2%) |
|                                                | Other methods* | 43 (17.2%) |

* dry leaves smoke/prevent collection of water/odomos cream/wearing full sleeve shirt

Almost 96% respondents had knowledge that mosquito bite is the cause for malaria and this finding was similar to the study done by Madne G et al, in rural Pune.13 Almost half of the study respondents (52.4%) had good knowledge about malaria symptoms and this finding was comparable with Gupta RK et al, and Joshi AB et al, studies.12,14

Majority of respondents considered malaria as a serious health problem and their attitudes towards vector control measures were positive in almost all respondents. Similar results were observed by Gupta RK et al.12 Regarding biting habit of mosquito, maximum respondents (50.4%) responded night time followed by day time (20.8%). Similar result was observed by De M.15 Television was the main source of knowledge about malaria in this study and similar finding was observed by De M et al, and Sharma A et al.15,16 Maximum respondents s had an attitude of consulting doctor for fever in any of the family members. The result was similar and comparable to Gupta RK et al, study and Singh R et al, study.12,17 Personal protection has very important role in prevention of malaria, but in this study only 30.4% respondents were using bed nets for the prevention of malaria and 86.4% respondents had a practices of cleaning surrounding for the prevention of mosquito bite. Similar finding was observed by Kumar KR et al, in rural Karnataka.18 The reason for not using bed nets may be cost of nets and use of mosquito repellents. Mosquito repellent coil or liquid vaporizer (65.2%) was most commonly used to prevent mosquito bite in this study and this was consistent with the finding of De M et al, and Sharma A et al.15,16 Overall, majority of the respondents had good knowledge
of malaria disease as well good practices of personal protective measures.

CONCLUSION

The study revealed that the respondents were familiar with the malaria symptoms, mode of transmission and vector control measures. They considered malaria as a serious health problem and their attitude towards treatment was prompt. IEC activities should be done to increase awareness and to promote malaria prevention in terms of bed nets use.

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REFERENCES

1. Operational Manual for Implementation of Malaria Programme 2009. Available at: http://nvbdcp.gov.in/Doc/malaria-operational-manual-2009.pdf. Accessed 3 October 2018.
2. WHO. World malaria report 2017. Geneva: World Health Organization. Available at: http://www.who.int/malaria/publications/world-malaria-report-2017/en/. Accessed on 3 October 2018.
3. Kumar A, Valecha N, Jain T, Dash AP. Burden of malaria in India: retrospective and prospective view. Am J Trop Med Hyg. 2007;77:69-78.
4. National vector borne disease control programme (NVBDCP). Malaria situation in India. Available at: http://www.nvbdcp.gov.in/Doc/malaria-situation.pdf. Accessed 5 October 2018.
5. Shivakumar Rajesh B, Kumar A, Achari M, Deepa S, Vyas N. Malarial trend in Dakshina Kannada, Karnataka: an epidemiological assessment from 2004 to 2013. Indian J Health Sci Biomed Res (KLEU). 2004;2015(8):91-4.
6. Malaria in Karnataka. Available at: https://www.malariasite.com/malaria-in-karnataka/. Accessed 16 October 2018.
7. Ministry of Health and Family Welfare, Government of India. Directorate General of Health Services, National Vector Borne Disease Control Programme. 2005. Available at: http://www.nvbdcp.gov.in. Accessed 16 October 2018.
8. Adera TD. Beliefs and traditional treatment of malaria in Kishe settlement area, southwest Ethiopia. Ethiopian Med J. 2003 Jan;41(1):25-34.
9. Ahorlu CK, Dunyo SK, Afari EA, Koram KA, Nkrumah FK. Malaria-related beliefs and behaviour in Southern Ghana: Implications for treatment, prevention and control. Trop Med Int Health. 1997 May;2(5):488-99.
10. Tyagi P, Roy A, Malhotra MS. Knowledge, awareness and practices towards malaria in communities of rural, semi-rural and bordering areas of east Delhi (India). J Vector Borne Dis. 2005 Mar;42(1):30-5.
11. Deressa W, Ali A, Enqoselassie F. Knowledge, attitude and practice about malaria, the mosquito and antimalarial drugs in a rural community. Ethiopian J Health Develop. 2003;17(2):99-104.
12. Gupta RK, Raina SK, Shora TN, Jan R, Sharma R, Hussain S. A household survey to assess community knowledge, attitude and practices on malaria in a rural population of Northern India. Journal of family medicine and primary care. 2016 Jan;5(1):101-7.
13. Madne G, Jindal A, Patel B, Sharma R, Kant R. Knowledge and practices concerning malaria in rural community of Pune district. Med J Dr. DY Patil Univ. 2014 Jul 1;7(4):450-3.
14. Joshi AB, Banjara MR. Malaria related knowledge, practices and behaviour of people in Nepal. J Vector Borne Dis. 2008 Mar 1;45(1):44-50.
15. De M, Mukherjee D, Paul S, Biswas R, Halder A. A study on knowledge and practices regarding malaria among adult urban population of Siliguri. J Dental Med Sci. 2015;14(9):33-6.
16. Sharma A, Gupta V, Khandelwal A. The knowledge, attitude and practices regarding commonly occurring mosquito borne diseases among people in catering area of urban health and training centre. Int J Comm Med Public Health. 2017 Jul 22;4(8):2864-9.
17. Singh R, Musa J, Singh S, Ebere UV. Knowledge, attitude and practices on malaria among the rural communities in Aliero, Northern Nigeria. J Fam Med Primary Care. 2014 Jan;3(1):39-44.
18. Kumar KR, Gururaj G. Community perception regarding mosquito-borne diseases in Karnataka State, India. Dengue Bull.2006;30:270-7. Available at: http://www.who.int/iris/handle/10665/170256. Accessed 15 November 2018.

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