

# Cross-Sectional Analysis of Malaria Awareness and Practices Among Rural Communities in South Goa

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**Abstract** — *Vector-borne diseases (VBDs) represent a substantial burden globally as well as in India. Frequent outbreaks of malaria occur in rural areas. Implementation of preventive and control strategies largely depends on the knowledge and behavior of the community towards the disease. Hence the present study was conducted on 140 participants in a rural area of Goa to assess the knowledge and behavioral practices regarding malaria. A cross sectional study among residents more than 18 years of age was conducted for a period of two months. Almost all i.e. 93.5% participants had heard about malaria, 85.5% knew that it is preventable and majority knew that it is transmitted only via mosquito bite. Around 51.2% of the participants thought mosquitoes spreading malaria breed in dirty water. Out of total 89.3% of the participants used some form of personal protective measure to avoid mosquito bite. Government sector was preferred for health care by 46.4% of the participants in case of fever while 10% did not want to take any form of treatment. Hence providing periodic health education is essential for raising awareness, achieving behavioral change and improving the health care seeking behavior.*

**Key words:** *Malaria, Rural, Knowledge, Health Care Seeking Behavior, Health Education.*

## I. INTRODUCTION

World Health Organisation defines vector-borne diseases (VBDs) as human illnesses which are caused by parasites, viruses and bacteria that are transmitted by mosquitoes, sand flies, triatomine bugs, blackflies, ticks, tsetse flies, mites, snails and lice. Globally, these diseases contributes to 17% of infectious diseases burden and are endemic in more than 100 countries affecting more than half of the world population.<sup>1</sup> Almost 70% of these countries are low and middle income including India resulting not only in loss of productivity, but also demand higher costs for health care and eventually pose a burden on public health services.<sup>2</sup>

Globally the most widely known VBD causing more than 400 thousand deaths annually is malaria<sup>1</sup>. This disease transmitted via the bite of infective female anopheles mosquito & caused by a protozoa named “plasmodium” and if it's left untreated may result in severe complications and death. The two most common species of plasmodium reported from India are Vivax and Falciparum.<sup>3</sup> Studies done in India have shown that almost 90% of deaths due to malaria occur in rural areas.<sup>4</sup>

India is facing a recent upsurge in the number of cases of this disease as compared to previous years, in total almost 1.09 million cases were reported in 2016 compared to 0.88 million in 2013. About 95% of the country's population resides in malaria endemic areas and 80% of cases reported are from population residing in tribal, hilly, difficult and inaccessible areas.<sup>5</sup>

Typical manifestations of this disease are intermittent paroxysmal fever with chills, headache, vomiting and other flu like symptoms, sometimes central nervous system may be involved in cases of falciparum cerebral malaria. Malaria is a disease of concern in the state of Goa as well. The state reported 742 cases of malaria in the year 2016 with 130 cases of falciparum malaria.<sup>5</sup>

The incidence of this disease can be reduced by effective vector control interventions and ensuring its implementation. National Vector Borne Disease Control Programme strategizes for the prevention and control of this disease is there but lack of community participation due to inadequate awareness, knowledge and unfocussed behavior towards this disease further worsens the situation. Collem is a beautiful village located in South East Goa along the foot hills of Western Ghats with greenery and rainfall, favours the growth of vectors for this disease. So for effective vector control and prevention against this disease, it is of vital importance to assess the knowledge and behavior of the community regarding the disease. So it was a felt need to conduct this present study.

## II. METHODOLOGY

The present cross-sectional descriptive study was conducted to assess the knowledge and behavioral practices regarding malaria among 140 participants aged more than 18 years residing in the rural area of Collem, Goa using simple random sampling method. Necessary permissions were taken and ethical clearance was obtained from the institutional ethics committee of Goa Medical College, Bambolim Goa.

Data were collected as per self-designed pretested structured questionnaire after taking informed consent. It took a period of two months from April to May, 2016 to cover up interrogation with selected 10 participants.

The collected data were analysed using SPSS version 22 and percentages were drawn.

## III. RESULTS

Out of the total 140 study participants, 78 (55.7%) were males and 62 (44.3%) were females. Majority i.e. 77 (55%) participants were belonging to the age group of 31-45 years, 34 (24.3%) belonged to 19-30 years age group, 17 (12.1%) were from 46-60 years age group while least was geriatric population over 60 years (8.6%).

**Knowledge:** Amongst 140 study participants, around 131 (93.5%) participants had heard about malaria. Out of these, 112 (85.5%) knew that it can be prevented. Majority (59.6%) of the participants knew that malaria if not treated early can be fatal leading to death. The most common source of information regarding this disease was doctors i.e. 42.8%. Around 116 (88.5%) participants said that malaria is transmitted only by mosquito bite. (Table 1)

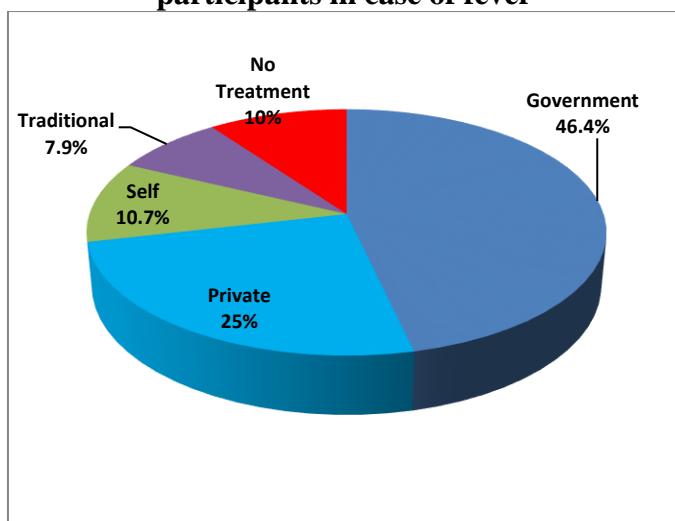
When asked about the time of mosquito bite, 17 (12.9%) said that mosquitoes transmitting malaria are day biters while majority i.e. 101 (77.14%) said that they are night biters whereas remaining (9.96%) did not know the exact time when mosquitoes transmitting malaria bites. When questioned regarding the breeding habits of mosquito causing malaria, majority i.e. 67 (51.2%) of the participants said that mosquitoes transmitting malaria breeds in dirty polluted water while 29 (22.14%) participants were aware that malaria mosquitoes breed in clean water. (Table 1).

**Table 1**  
**Awareness regarding malaria, its transmission, prevention & consequences in study population**

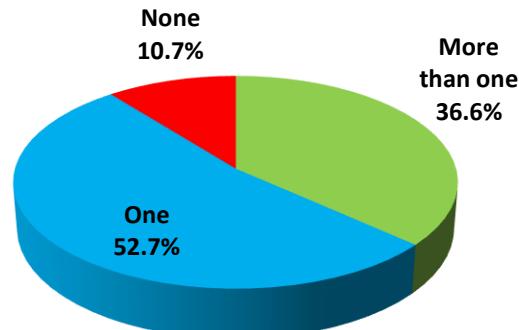
Awareness Questions	Answers	Number (N=140)	Percentage
Heard about malaria	Yes	131	93.5
	No	9	6.5
Can malaria be prevented	Yes	112	85.5
	No	7	5.3
	Do not know	12	9.2
Can malaria cause death	Yes	78	59.6
	No	24	18.3
	Do not know	29	22.1
Source of information	Doctor	56	42.8
	Family/relatives/friends	7	5.4
	Health workers	16	12.2
	Media	10	7.6
	More than one source	42	32
Transmission of malaria	Only mosquito bite	116	88.5
	Other sources	6	4.6
	More than one source	9	6.9
Time of mosquito bite	Day	17	13
	Night	101	77.1
	Don't know	13	9.9
Breeding of malaria mosquitoes	Clean water	29	22.1
	Dirty polluted water	67	51.2
	Both	21	16
	Don't know	14	10.7

**Behaviour and practices:** With regards to the health seeking behavior of the participants in case of fever an overwhelming (81.4%) number of study participants delayed reporting to health care facility for more than 24 hours while remaining only 18.6% reported within 24 hours. For treatment 46.4% participants preferred government sector, 25% seek private sector, 10.7% tried self medication, 7.9% opted for traditional healers while remaining 14 (10%) did not take any remedies in case of fever. (Figure 1)

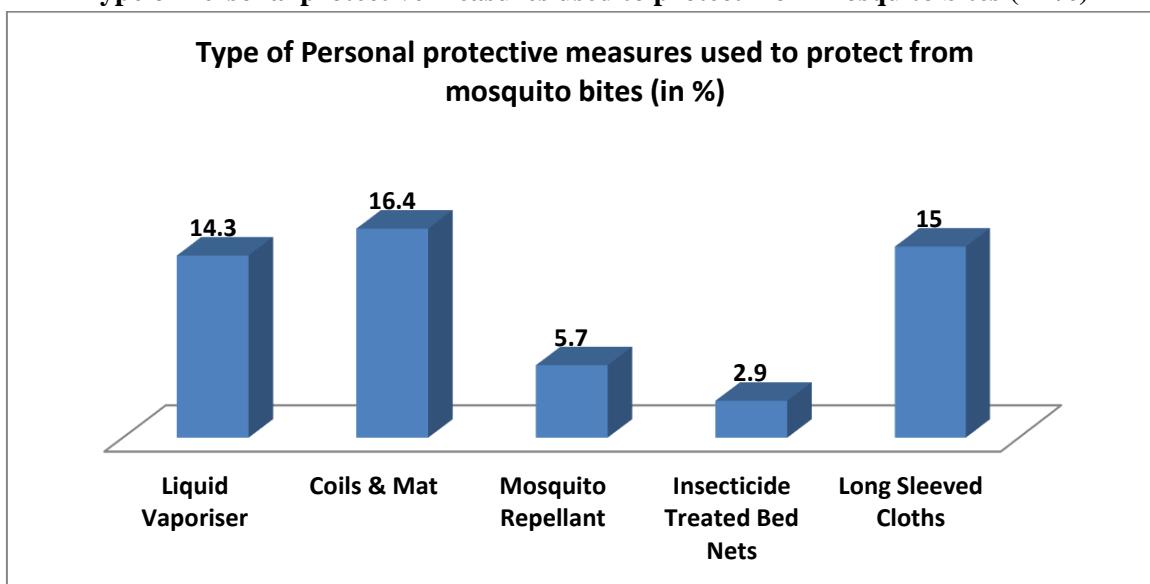
**Figure 1**  
**Health care seeking behavior of the study participants in case of fever**



**Figure 2**  
**Number of Personal protective measures from mosquitoes bite used**



**Figure 3**  
**Type of Personal protective measures used to protect from mosquito bites (in %)**



So as far as the use of personal protective measures from mosquitoes was considered, one third of the study participants (33.6%) used more than one measure, 14.3% used only liquid vaporisers, 16.4% burnt coils and mats, 5.7% of the participants applied mosquito repellent creams locally, while insecticide treated bed nets were used by 2.9% of the participants. Around 15 (10.7%) participants did not use any measure to avoid mosquito bites and were at risk of exposure. (Figure 2)

When asked whether insecticide spraying was done in or around the house of the participants in the past 12 months, almost 98 (70%) participants had got their house or surrounding sprayed with insecticide which according to vast majority (93.6%) was responsibility of the Government. (Table 2)

**Table 2**  
**Awareness Regarding Insecticide spraying done in or around the house of the study participants**

Awareness Regarding Insecticide Spraying	Response	Number(N=140)	% (100)
Insecticide spraying done in or around the house in the past 12 months	Yes	98	70
	No	31	22.1
	Don't know	11	7.9
Responsibility of spraying	Self	2	1.4
	Nobody	0	0
	Government	131	93.6
	Don't know	7	5

#### IV. DISCUSSION

Assessment of knowledge, awareness and behavioral practices regarding any disease is of pivotal importance for planning and implementation of varied public health interventions. This is of superior value in case of diseases like malaria where participation of community is the key. It will further help in research related activities and hence in changing the behaviours of the community.

In the present study majority of the participants belonged to the age group of 31 to 45 years with higher number of male participants compared to female participants.

Out of the total 140 participants interviewed, 93.5% had heard about malaria with the doctor being the commonest source of information. 59.6% knew that it can lead to death if not treated in time while 85.5% knew that it is a preventable disease. Mahesh V et al in Kolar India observed comparable findings wherein 78.2% of the participants knew about malaria and largely through doctors, 53.5% considering it a fatal disease with 92% opining it to be a preventable disease.<sup>6</sup> Our study showed that majority (88.5%) of the participants knew the correct means of malaria transmission i.e. through mosquito bites, with 77.1% opining that malaria transmitting mosquitoes bite mostly in the night time. A study done in Ethiopia by Andargie Abate et al found similar results.<sup>7</sup> Only 22.1% of the participants knew correctly that mosquitoes transmitting malaria breed in clean water while majority i.e. 51.2% felt they breed in dirty polluted water. A study done by Singh RK et al in Jharkhand reported similar results with regards to mosquito breeding.<sup>8</sup>

Health care seeking behaviour of the participants in the present study was poor with majority (81.4%) taking more than 24 hours to report any medical facility in case of fever and almost 10% of the participants not taking any treatment. Rajiv Kumar Gupta et al in their study observed that 56.08% of the participants would seek medical help within 24 hours which is dissimilar to our study findings probably because of varied socioeconomic factors and cultural beliefs.<sup>9</sup> In our study, government sector was preferred over private sector and traditional healers which was similar to the results of the study done by Rajiv Kumar Gupta et al<sup>9</sup>. However almost 10.7% of the participants practiced self medication in the present study while in a study done by K. Ravi Kumar and G. Gururaj in rural Kolar and urban Bangalore observed 18.11% of rural participants self medicating.<sup>10</sup>

Altogether 89.3% of the participants used some form of personal protective measure to avoid mosquito bite while 10.7% did not use anything. Of these 33.6% used multiple personal protective measures whereas only 2.9% used insecticide treated bed nets while sleeping. In the study done by K. Ravi Kumar and G. Gururaj, 83.8% of the rural participants used personal protective measures of which 19.4% used multiple measures while 14.4% used bed nets whereas 16.2% did not use any protective measure.<sup>10</sup>

Higher percentage (70%) of the study participants reported insecticidal spraying/fogging in and around their houses during the past 12 months, with majority believing it to be a government responsibility. Study done in Ethiopia by Andargie Abate et al observed almost 78.9% of the participants using insecticide spraying as a mosquito preventive measure.<sup>7</sup>

## **V. CONCLUSION**

In view of the above findings it can be concluded that although majority of the study participants were aware of malaria as a disease, knowledge regarding the vector breeding was inadequate due to which implementation of varied preventive measures is hampered. Most participants used some form of personal protective measure but health care seeking behavior was poor as majority were delayed to seek medical care while some preferred self medication and some taking no form of treatment. Hence providing regular and periodic health education is vital for raising awareness, achieving behavioral change and improving the health care seeking behavior.

## **CONFLICT OF INTEREST**

None declared till now.

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