

Awareness and Practices Regarding Malaria amongst Construction Workers in Goa: Mixed Methods Approach.

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Abstract: Background: Malaria in Goa is showing a decreasing trend. Most of the malaria cases are found in areas around construction projects. Hence it is important to understand the Knowledge, attitude and practices amongst construction workers about malaria; in order to achieve elimination. **Aims and Objectives:** To study the knowledge, attitude and practices amongst construction workers regarding the prevention, spread and control of malaria and to assess the status of health cards amongst these construction workers. **Materials and Methods:** The demographic and the knowledge, attitude and practice towards malaria was assessed using a prestructured questionnaire made from previous studies. Focus group discussions and open ended interviews were also conducted. **Results:** The knowledge, attitude and practices among the construction workers is good, but needs improvement. Few myths and misconceptions still exist. Health cards are being maintained in most of the construction firms. **Conclusions:** The state of Goa is slowly moving towards malaria elimination, however special attention should be given to the high risk populations like construction workers. There is a need to strengthen the BCC activities pertaining to malaria in the state in order to achieve Elimination.

Keywords: Malaria, Goa, Construction Workers, Health Cards.

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I. Introduction

Globally, according to the WHO malaria report 2016, an estimated 3.3 billion people in 97 countries and territories are at risk of being infected with Malaria and developing disease and 1.2 billion are at high risk (>1 in 1000 chance of getting Malaria in a year).

Out of the four species of plasmodium, P. falciparum and P. Vivax pose the greatest public health challenge. The incidence of Pf is increasing throughout the world and also accounts for most deaths from Malaria. Pv can develop in Anopheles mosquito vector at lower temperatures and can survive higher altitudes and in cooler climates and thus Pv was the predominant form of Malaria found in India⁽¹⁾. However this trend is fast changing with incidence of falciparum malaria being on a rise

According to the Directorate Health services report, Goa, the trend of malaria in the state of Goa is negative with the number of cases rapidly declining with 732 cases of malaria being reported in the year 2016, however 82% of these cases were from areas with construction projects and only 18% were from non-project areas.

We conducted the study with the following aims and objectives:

- To study the knowledge, attitude and practices amongst construction workers regarding the prevention, spread and control of malaria.
- To assess the status of health cards amongst these construction workers.
- To make recommendations based on the study.

II. Materials and Methods

Five construction sites in peri-urban and rural areas of Goa were selected. The duration of the study was 3 months. Ethical clearance was obtained from the Institution Ethics Committee. Permission was taken from the builder's and informed consent was taken from all the participants.

All construction workers were approached from 5 randomly selected construction sites. The workers were mostly migrants hailing from the 14 different states of India predominantly Karnataka, Maharashtra, Bihar, UP, West Bengal etc. along with a few natives from the state of Goa.

200 construction workers speaking English, Hindi, Konkani and Bangla were included in the study, 8 workers were excluded due to language constraints and 5 workers did not give consent to participate in the study.

Strict confidentiality was maintained

Methodology

The study had a mixed methods approach with a quantitative and a qualitative component.

The qualitative component included semi structured questionnaires prepared from previous studies. ,translated into vernacular languages, it was pretested and administered. The questionnaire was standardized for the population of Goa with additional questions added to assess the awareness regarding the health card status, dry days etc.

Dry day is a practice where one day of a week is selected as dry day and all containers used for storing water at the construction sites are emptied and cleaned.

The questionnaire consisted of fifty questions assessing the awareness `knowledge regarding Malaria broadly under the following subtopics.

- 1) Basic Knowledge about Malaria.
- 2) Knowledge about personal protective measures.
- 3) Sources of information about Malaria.
- 4) Treatment seeking behaviour amongst the subjects
- 5) Attitudes and beliefs surrounding Malaria.
- 6) Health card status

Analysis: The results were analyzed using Microsoft Excel spreadsheet.

The qualitative aspect of the study involved conducting two focus group discussions at two different construction sites. The participants for FGD’s included 10 male construction workerschosen randomly from each construction site. All workers were migrant labourers.A protocol was prepared for the FGD, all the discussion was recorded. FGD’s lasted for 30 to 40 minutes.

The findings of the focus group discussion were translated, coded and analyzed.

III. Results

The study was conducted in 5 construction sites. 2 sites were in rural areas, 1 was in peri-urban area and 2 sites were close to beaches.

Out of the total of 200 construction workers approached 164 (82%) were male whereas the remaining 36 (18%) were females. This was representative of the total worker population at the construction sites.

One Hundred and Seventy Eight (89%) construction workers were migrant laborers coming to Goa from states like Karnataka 23 (13.5%), Uttar Pradesh 40(20%), Bihar 32 (16%), Maharashtra 17 (8.5%), Odisha 8 (4%), Madhya Pradesh 4 (2%), Rajasthan 4 (2%), Chhattisgarh 12 (6%), Jharkhand 14 (7%), West Bengal 18 (9%), Andhra Pradesh 7 (3.5%), Telangana 4 (2%), Tamil Nadu 12 (6%), Kerala 10 (5%), Madhya Pradesh 2 (1%) to work on short term basis mainly at construction sites. Twenty Two (11%) workers were natives of state of Goa.

Sociodemographic characteristics Table I:

Socioeconomic Class as per BG Prasad socioeconomic scale	
Socioeconomic Class	Number of workers
Lower Class	130
Upper Lower Class	52
Lower Middle Class	18
Age Groups in years	Number of workers
20-30	48
30-40	46
40-50	66
50-60	40

Literacy Levels	Number of workers
Illiterate	70
Primary	120
Secondary	10
Higher Secondary	0

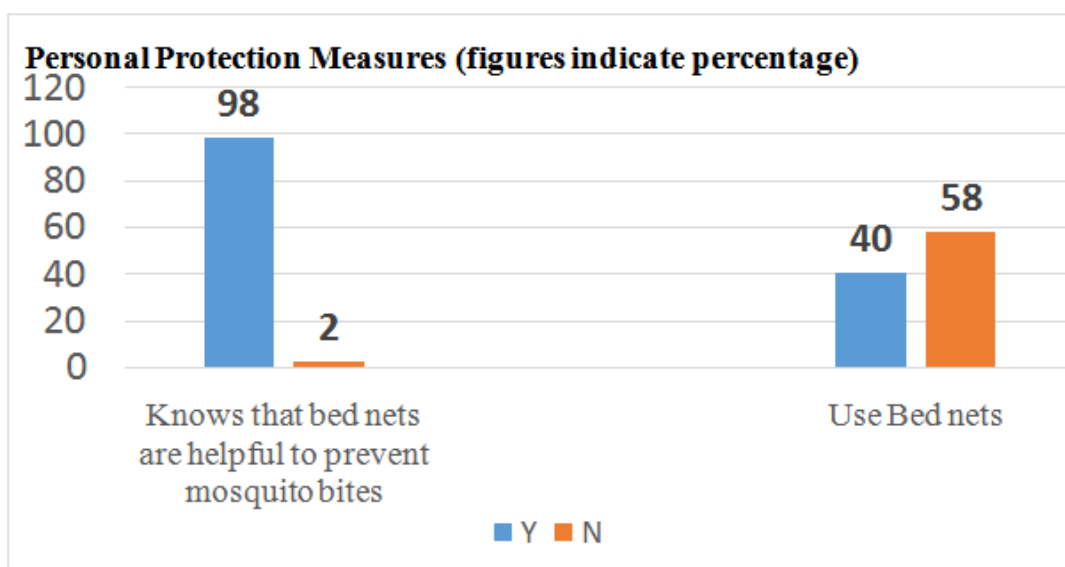
Table II knowledge about malaria

Basic Knowledge about Malaria	Number of workers (Positive response)	Percentage %
1) Have you heard about Malaria?	168	84
2) Do you know the vector and mode of spread of Malaria?	144	72
3) Do you know the signs and symptoms of malaria?	136	68
4) Are you aware of mosquito breeding sites?	100	50
5) Are you aware that construction sites are breeding grounds for mosquitoes?	106	53

6) Do you think that malaria is a life threatening disease?	148	74
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Table III: Practices for personal protection

Personal protective measures	Number of workers	Percentage %
1) Bed nets	80	40
2) Mosquito repellent coils	152	76
3) Mosquito repellent lotion	4	2
4) Indian Lilac (neem) leaves	8	4
5) Gauze wire nets	12	6
6) Do nothing	4	2



It was noted that many workers used more than one personal protective measure against mosquitoes.

All workers said that they owned a bed net at home, however only 80 (40%) said that they used bed nets for personal protection.

When questions were asked regarding delay in seeking treatment after developing symptoms like fever with chills, 164 (82%) of the workers said that they seek medical attention within the first 24 hours. However 32 (16%) of workers said they wait for 1-2 days before seeking medical care whereas 4(2%) of workers said they wait for more than 2 days before seeking medical care.

Out of the 200 workers 64 (32%) gave a history of either them or some family member suffering from Malaria. The knowledge and treatment seeking behavior was found to be better among these workers as compared to others.

When asked about who they approach in case of developing symptoms, 184(92%) of workers said they approach a Health Centre, Clinic or a community health worker for treatment whereas 16 (8%) workers said they approach Traditional medicine practitioners for treatment.

When questions were asked regarding the sources of information regarding malaria, 100 (50%) workers said they received information about malaria from Doctors/Health Workers, 20(10%) of workers said they received information from schools, 66 (33%) said TV, Radio, Newspapers was their source of information whereas 54 (27%) said they received information about malaria from family members and neighbours.

180 (90%) of the workers said they would prefer to get more information about the disease from Health Centres, whereas 20 (10%) said they would like to get more information from traditional medical practitioners.

When enquired about which aspect of the disease they would like to get more information about, 12(6%) of the workers said they have all the information they needed, 12(6%) workers said they needed more information about the signs and symptoms of the disease, 24(12%) wanted more information about prevention and control of the disease whereas 24(12%) said they wanted to know more about the treatment of the disease.

A majority 128(64%) said that their knowledge was lacking and needed information in all the aspects of the disease.

Misconceptions regarding malaria

Ten (5%) of the workers believed that malaria could spread through contact with the affected individual's and thus close contact should be avoided with the affected. A majority 142 (71%) of workers knew that malaria can't spread through contact whereas 44 (22%) of workers didn't have any opinion regarding this. One hundred and sixty (80%) of people were aware that anybody irrespective of the age or gender can get malaria. Eight (4%) of workers believed that malaria only affects certain group of individuals (eg: pregnant ladies) whereas 28 (14%) of workers didn't have any opinion regarding this.

Additional questions were asked to assess the awareness regarding the necessity of complete treatment of malaria and awareness regarding the expiry date of medications. The results were as follows
 One Hundred and Fifty Two (76%) workers said that it was dangerous if Malaria treatment once started was left incomplete whereas 16 (8%) workers said it was okay to stop treatment once symptoms relieved, 32 (16%) workers didn't have any opinion on this matter.
 Seventy Six (38%) workers were aware about the importance of expiry date mentioned on the packets whereas 4 (2%) workers said it wasn't important to check expiry dates on before buying medications. A large number i.e. 120 (60%) workers were unaware about the existence of expiry dates or its importance.

Finally questions were asked about the Goa Government strategy to provide health cards to all the migrant laborers and regularly update them following checkup.

Results are show in table VII

Question	Yes	No	Don't know
Have a health card?	150	24	26
Was blood test done on arrival?	160	28	12
Were you detected positive?	20	52	28
Received adequate treatment on detection?	20	0	0
Followup done?	0	150	50

It was noted that the contractor generally kept all the health cards in his possession and the workers were thus unaware about its status.

Focus Group Discussion

FGD were conducted at 2 construction sites in a peri-urban area in Goa with 10 construction workers each. All the construction workers included were males from various age groups.

The aim was to further explore the findings from the quantitative data.

The discussion topics included the knowledge about malaria, its transmission, breeding sites and prevention practices.

Majority had basic knowledge about malaria. However, there exists some misconceptions:-

Malaria can spread through touch, clothing's and sharing toilets.

Some believed that breeding site for mosquito was moist soil.

Some believed that Fever with chills was a form of punishment by God for those who commit sins, and nothing can be done about it.

Some believed that only pregnant women could be infected with malaria.

Other findings include

The practice of releasing guppy fish in the curing tanks was an age old practice, however they did not know the reason for the same.

The workers knew that their blood was withdrawn at the time of their entry in Goa, and regularly was done so. However they did not have any idea as to why this was done.

Managers told that they themselves keep the health cards, and do not distribute the cards to the individual, as they tend to lose/tear the card.

Certain firms have distributed free bed nets. However, not many workers use it. They find it uncomfortable to use bed nets in the warm humid weather of Goa.

Many use these freely distributed bed-nets as pillows.

Dry days are observed regularly in June-September, though erratically.

After a construction site is closed down, the follow up activity to remove potential sources of vector breeding is neglected.

Some excerpts from the FGD's are mentioned below:

‘Malaria spares no-one’ – 34 year old construction worker from Jharkhand.

‘Fever with chills was a form of punishment by God for those who commit sins, and nothing can be done about it.’ – 40 year old construction worker from West Bengal

‘When we entered Goa, within a week we had to undergo some procedure. They took out some blood. They said they will give us some card.’- 22 year old construction worker from Bihar

‘There are so many mosquitos where we reside. It is a big problem especially at night!’ – 28 year old construction worker from Odisha

IV. Discussion

Various studies have been conducted in India and abroad to assess the knowledge, attitude and prevention practices amongst construction workers regarding malaria^{2,3,4}. It is important to acknowledge them as a population at risk. Interventions can be planned only after knowing the present status of knowledge and awareness of these workers about malaria, and the cultural practices prevalent there. One of the findings in the study is that 178 (89%) of the workers are migrant labourers coming to the state of Goa for short periods of time. This can be relevant in two ways

- 1) People coming from low risk areas to Goa are more susceptible to Malaria due to absence of natural immunity in them.
- 2) People coming from various states having high incidence of Malaria may be carriers of the disease i.e. they carry the parasite in their body without any possible signs and symptoms of the disease. Such people act as a reservoir of infection for the general population and also due to the absence of signs and symptoms are more likely to be undiagnosed. This is known as **Silent Malaria**⁵.

In this study it was found that most of the workers had basic awareness about Malaria however, 32 (16%) of the worker population were unaware of the disease Malaria. Generally this group included people aged 20-30 years and were illiterate. Older people and those having at least primary education were better aware about Malaria. This was because old people have seen a case of Malaria among friends or family or heard about it from family members or co-workers. Also older people had been coming to work in the state of Goa repeatedly for many years and attended various health talks by Health Workers in the past. According to a study conducted by Mahesh.V. et al, Malaria preventive measures are related to knowledge and beliefs of people. The poor and vulnerable populations are disproportionately affected by malaria and the severe consequences of malaria are borne more by the poorest. The study was conducted in a rural setting. The findings showed that doctors played a pivotal role in disseminating knowledge regarding malaria, and also incorporate Behavioral Change Communication amongst them. The study showed that 78% of the sample size was aware of various attributes of the disease.⁶

The workers were aware about the vector of Malaria and its mode of transmission. However there were certain misconceptions noted among a few workers for e.g.

- 1) Malaria can spread through touch, clothing's and sharing toilets.
- 2) Some believed that breeding site for mosquito was moist soil and garbage.
- 3) Some believed that Fever with chills was a form of punishment by God for those who commit sins, and nothing can be done about it.
- 4) Some believed that only pregnant women and children could be infected with malaria.

Lack of knowledge about breeding sites results in ignorance and plays a major role in breeding of the vector and propagation of the disease⁶.

Bed nets were the most common personal protective measures (92%) this may be due to the fact that insecticide lined bed nets (ILRS) are provided free under the NVBDCP. However when asked if the bed nets were treated with insecticide they were unaware about it. Also questions were asked on whether they maintain the bed nets i.e. close any opening in the bed nets, all workers agreed to maintain their bed nets and repair any damage. Regular appropriate use of bed nets is the single safest and most effective means of prevention of Malaria and thus its use has to be promoted. Reasons for noncompliance to usage of bed nets was found to be due to warm humid weather in goa. Similar studies conducted in other areas showed that the compliance to the use of bed nets was below par, despite good preexisting knowledge about malaria and its prevention⁷⁻⁸. This is an important finding as it implies that we need to supplement the use of bed nets with other prevention practices like mosquito coils, etc.

While assessing the source of knowledge among workers a 32 (16%) workers said they never received any talk on the topic of Malaria. This was seen mainly among those who were young i.e. belonged to the group of 20-30 years and had come to Goa just a few months back. One Hundred and Twenty Eight (64%) workers said that they had received health talks on Malaria upon their stay in the state in the past. As Behavioral Change

Communication is very important as far as malaria programmes are concerned, we need to strengthen good communication amongst health personnel and the construction workers.

In a similar study done in Ethiopia in central Africa, it was found that the knowledge about malaria amongst construction workers was poor, and they seldom practiced any preventive measures. This makes them more vulnerable to suffer from malaria. Behavioral Change Communication can help increasing the knowledge and prevention practices amongst the population.⁹

It was found that 150 (75%) workers had health card made, and 24 (12%) workers didn't have a health card and 26 (13%) workers were unaware about their health card status. Of the 24 (12%) workers who didn't possess a health card it was found that almost all of them had recently arrived from their native places and were in Goa for less than a month. Blood tests were done on 160 (80%) of the workers and those who were tested positive received prompt and adequate treatment. It was found that 150 (75%) workers said there was no follow-up done after the initial test for Malaria whereas the remaining were unaware about the whole process. Regular follow-up is essential to diagnose the cases early as Malaria spreads rapidly among the worker population due overcrowding and lack of sanitation at their place of residence.

One of the important finding of the FGD was that all the health cards were kept with the contractor and the workers were unaware about their existence. Health cards have also been instrumental in identifying cases of silent Malaria as 20 (10%) of the workers had been diagnosed positive for Malaria on testing blood for health cards and those found positive were treated adequately. Maintenance of health cards might have been a contributory factor in decrease in the trends of Malaria seen in recent years.

Goa is showing a decreasing trend in the number of malaria cases over the past few years. Goa in Elimination Stage:

- API State Level 0.43
- API District Level < 1 (Both District)
- API PHC/UHC/ CHC Level > 1 at 5 centres
- API Sub centre Level > 1 at 14 sub centres

Goa could be the first state to achieve malaria elimination. Thus, it is important to identify the vulnerable areas and accordingly take necessary actions to control malaria in these states. Over 80% of the malaria cases come from areas in and around construction areas. Hence these areas need greater attention.

V. Conclusions and Recommendations

The state of Goa is slowly moving towards malaria elimination, however special attention should be given to the high risk populations like construction workers.

Even though the basic knowledge about malaria exists among construction workers there are some serious misconception among the population. Greater efforts are needed to clear these misconceptions.

There is an urgent need of intensifying and streamlining of ongoing **malaria BCC activities** for construction site workers in Goa, India in order to improve the use of protection measures among the worker population.

Rather than distributing free bed nets, **fumigating** the area/ distribution of mosquito coils is likely to be more effective, especially in summers.

Health cards should be maintained better. Also, there should be regular follow-ups and the card should be updated regularly.

Common practices, like keeping **guppy fish** in the curing tank, covering the curing tan with nets, should be inculcated.

Involvement of the employers and contractors is a must if success has to be achieved in controlling malaria prevalent at the construction sites

Regular/ weekly anti larval measures should be carried out at the construction sites.

Special efforts have to be taken to prevent water stagnation and vector breeding at construction sites with special attention given to closed down and abandoned sites.

Early diagnosis and prompt treatment of the affected workers is also of utmost importance.

These aspects need to be looked upon if Goa has to achieve the goal of Malaria Elimination.

References

- [1] Kumar A, Chery L, Biswas C, Dubhashi N, Dutta P, Dua VK, Kacchap M, Kakati S, Khandeparkar A, Kour D, Mahajan SN, Maji A, Majumder P, Mohanta J, Mohapatra PK, Narayanasamy K, Roy K, Shastri J, Valecha N, Vikash R, Wani R, White J, Rathod PK: **Malaria in South Asia: prevalence and control.** *Acta Trop* 2012, **121**:246-255.
- [2] 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;42:30-5.
- [3] Keating J, Eisele TP, BeNET A, Johnson D, McIntyre K. A description of malaria-related knowledge, perceptions, and practices in the Artibonite Valley of Haiti: implications for malaria control. *Am J Trop Med Hyg.* 2008;78:262-9.
- [4] Simsek Z, Kurcer MA. Malaria: knowledge and behaviour in an endemic rural area of Turkey. *Public Health.* 2005;119:202-8.

- [5] A Lindblade, Kim & Steinhardt, Laura & Samuels, Aaron & Patrick Kachur, S & Slutsker, Laurence. (2013). The silent threat: Asymptomatic parasitemia and malaria transmission. Expert review of anti-infective therapy. 11. 623-39. 10.1586/eri.13.45.
- [6] Mahesh.V, Muninarayana.C, Anil.N.S, Ravishankar.S, Prabhudeva M.C, Sunil B.N. **Knowledge, Attitude, Practices about Malaria in a Rural Endemic Area of Kolar, India.** *IJHSR*. 2014; 4(3): 9-15
- [7] Shivalli S, Pai S, Akshaya KM, D'Souza N. Construction site workers' malaria knowledge and treatment-seeking pattern in a highly endemic urban area of India. *Malar J*. 2016;15:168. Published 2016 Mar 16. doi:10.1186/s12936-016-1229-2
- [8] 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;42:30–35.
- [9] Sabin LL, Rizal A, Brooks MI, Singh MP, Tuchman J, Wylie BJ, Joyce KM, Yeboah-Antwi K, Singh N, Hamer DH: **Attitudes, knowledge, and practices regarding malaria prevention and treatment among pregnant women in Eastern Africa** .*Am J Trop Med Hyg* 2010, **82**:1010-1016.

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