

Do Migrants Differ in Knowledge Regarding Mosquito-Borne Diseases and Mosquitoes?

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Abstract

Introduction: Mosquito-borne diseases (MBDs) are one among the major public health problem in India. Surat city being endemic for MBDs and catering large proportion of migrants along with the non-migrants motivated us to conduct this research to study and compare the knowledge about MBDs and mosquitoes among migrants and non-migrants.

Methods: A community-based cross-sectional study conducted among migrant and non-migrant families of Surat city by employing a stratified sampling technique and using a pretested semi-structured questionnaire between July 2015 and October 2016.

Results: Equal number of migrant and non-migrant families were studied (200 each) of which majority of migrant families were from Uttar Pradesh and Bihar (46%) with lower middle socioeconomic class (38.5%) while the majority of non-migrants were from upper middle socioeconomic class (39%). The ability to name at least one MBD was less among migrants (67%) as compared to non-migrants (73.5%). Significantly higher number of non-migrants (52.5%) named dengue as MBD as compared to migrants (39.5%) ($P = 0.01$). Similarly, significant higher number of non-migrants (51.5%) mentioned fever with chills as the symptom of malaria as compared to migrants (41%) ($P = 0.04$). Around 48% non-migrants and 38% migrants knew that different types of mosquito exist. Around 62% non-migrants and 55% migrants knew that mosquito lay eggs and among them more than half replied water as the breeding place for mosquitoes. It was observed that breeding places in ($P = 0.04$) and around ($P = 0.03$) the houses of migrants were significantly higher as compared to non-migrants.

Conclusion: Study findings clearly shows that overall non-migrant respondents had higher knowledge about MBDs and mosquitoes in comparison to migrant respondents and thus emphasizes the need for generating the awareness regarding MBDs and mosquitoes especially in areas dominated by migrant population.

Key words: Knowledge, Migrants, Mosquito-borne diseases, Mosquitoes, Non-migrants

INTRODUCTION

Vector-borne diseases (VBDs) are an important group of infectious diseases. Over half of the world's population is at risk from VBDs. They account for 17% of the estimated global burden of all infectious diseases.^[1] Among VBDs, mosquito-borne diseases (MBDs) are an important public health problem in countries of South East Asia Region (SEAR) including India. Malaria,

Dengue, and Filariasis are the prevalent MBDs in India and are also responsible for considerable morbidity and mortality.^[2]

Migration plays a very important role in the spread of MBDs. Migrants may have a lot of difference in their housing conditions, environment, knowledge, and practices. As a result, their health status is also different. A study has also documented that these differences are seen even in health behavior.^[3]

Surat city being endemic for MBDs such as malaria, dengue, and filariasis due to its favorable climatic condition and also a city with highest migrant population provided us an excellent opportunity to study how migrants were different as compared to non-migrants in their knowledge regarding MBDs and mosquitoes.^[4,5]

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MATERIALS AND METHODS

This was a community-based cross-sectional study, conducted among migrant and non-migrant families between July 2015 and October 2016, in Godadara area of South-east zone of Surat city.

For the purpose of the study, we defined Migrant family as a family which has migrated to Surat (particularly in Godadara area) from any other city of Gujarat or India and has stayed for a period of <10 years and non-migrant family as a family which has been living in Surat (particularly in Godadara area) for 10 years or more. Near about 400 families were studied, out of which 200 were migratory and 200 were non-migratory families. Stratified sampling technique was employed. The whole study population was divided into migrant, and non-migrant population and the migrant population was divided into 5 strata based on their native place (4 states and 1 other districts of Gujarat). A total of 400 adult individuals (200 each from migrant and non-migrant families) were interviewed. A pre-tested semi-structured questionnaire was used to collect data which was entered into Microsoft Excel and analyzed using IBM SPSS v 19 software. The χ^2 -test was used for the group comparisons.

RESULTS

Sociodemographic information as depicted in Table 1 shows that majority of migrants belonged to Uttar Pradesh and Bihar and were in age group of 31–40 years. Most of the migrants studied up to secondary and non-migrants up to higher secondary school. Higher number of migrants belonged to lower middle class, and non-migrants belonged to upper middle class. Almost half of the non-migrants had outdoor sleeping habits [Table 1].

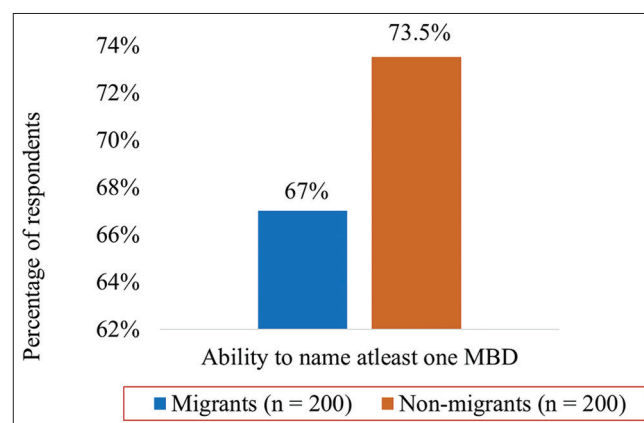
Ability to name at least one MBD was less among migrants 134 (67%) as compared to non-migrants 147 (73.5%) [Graph 1]. About 138 (69%) non-migrant and 125 (62.5%) migrant respondents named Malaria while significantly higher number of non-migrants 105 (52.5%) named dengue as MBD as compared to migrants 79 (39.5%) ($\chi^2 = 6.80$, $df = 1$, $P = 0.01$).

Significantly, higher number of migrants 56 (28%) mentioned fever ($\chi^2 = 4.51$, $df = 1$, $P = 0.03$) while significantly higher number of non-migrants 103 (51.5%) mentioned fever with chills as the symptom of malaria ($\chi^2 = 4.44$, $df = 1$, $P = 0.04$) [Graph 2].

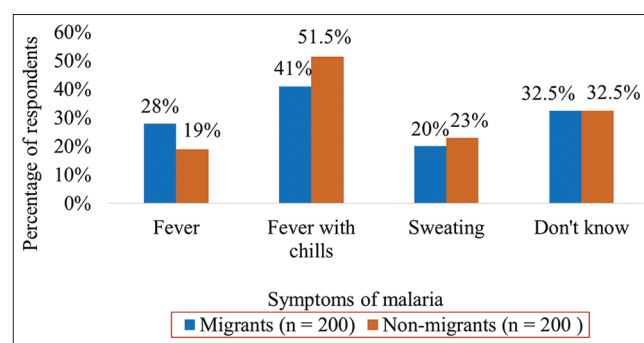
There was no significant difference in the knowledge about symptoms of dengue among migrants and non-migrants [Graph 3].

Around 76 (38%) migrants and 96 (48%) non-migrants knew that different types of mosquito exist. Among them, higher number of migrants knew the correct vector of malaria 34 (44.7%) and its biting time 35 (46.1%) [Graph 4].

Higher number of non-migrants 59 (61.5%) knew that aedes mosquito is the vector for dengue as compared to migrants 39 (51.3%); similarly the knowledge regarding



Graph 1: Ability to name at least one mosquito-borne disease

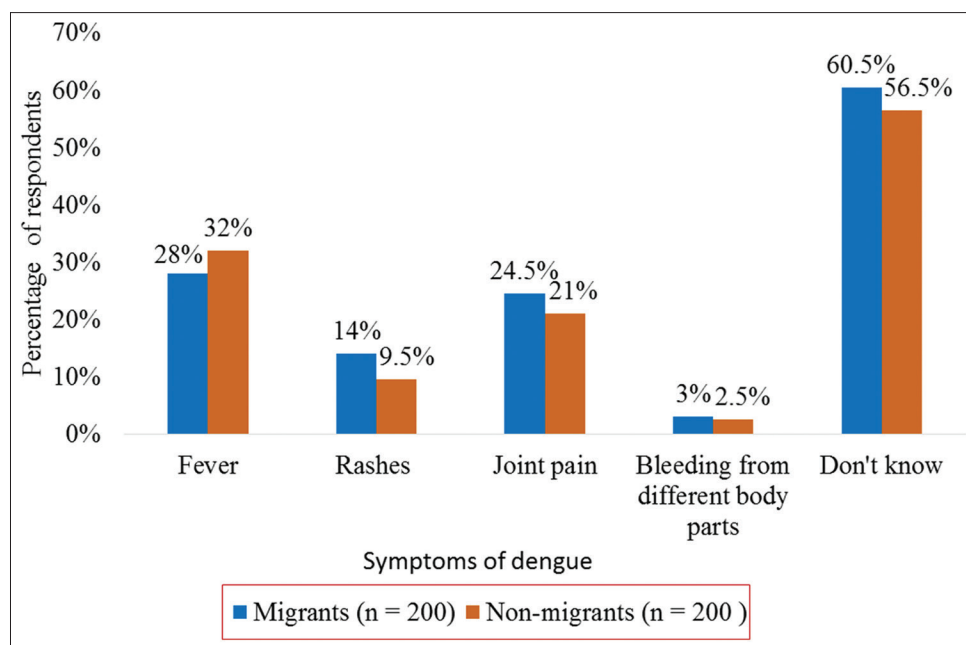


Graph 2: Knowledge about symptoms of malaria

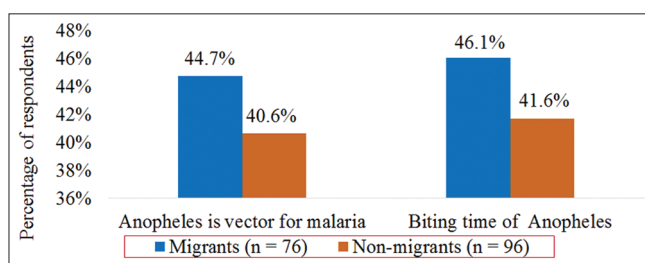
Table 1: Sociodemographic information

Variables	Migrants 200 (100%)	Non-migrants 200 (100%)
State	Uttar Pradesh and Bihar 92 (46%)	Surat 200 (100%)
Age group (in completed years)	31–40 years 81 (40.5%)	31–40 years 72 (36%)
Education*	Secondary 55 (27.5%)	Higher secondary 42 (21%)
Socioeconomic status**	Lower middle 77 (38.5%)	Upper middle 78 (39%)
Outdoor sleeping habits	79 (39.5%)	99 (49.5%)

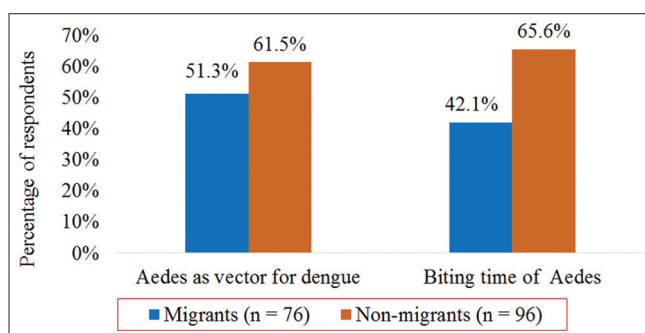
*Education - Secondary school: 9th and 10th standard, higher secondary school: 11th and 12th standard, **Socioeconomic status based on modified prasad's classification (February 2015 AICPI = 1171)



Graph 3: Knowledge about symptoms of dengue



Graph 4: Knowledge about malaria vector and its biting time



Graph 5: Knowledge about dengue vector and its biting time

correct biting time of the aedes mosquito was also more among non-migrants 63 (65.6%) as compared to migrants 32 (42.1%) [Graph 5]. Higher proportion of non-migrants knew that Culex is a vector for filariasis 26 (27.1%) and also knew its biting time 36 (37.5%) [Graph 6].

Around 110 (55%) migrants and 123 (61.5%) non-migrants knew that mosquito lay eggs. Among them, more than half replied water as breeding place (61 [55.5%] migrants and 64 [52%] non-migrants, respectively). Among them, a higher

proportion of migrants had knowledge about the breeding habit of Anopheles 33 (54%), and a higher proportion of non-migrants had knowledge about the breeding place of Aedes 35 (54.7%) and Culex 52 (81.3%) [Graph 7].

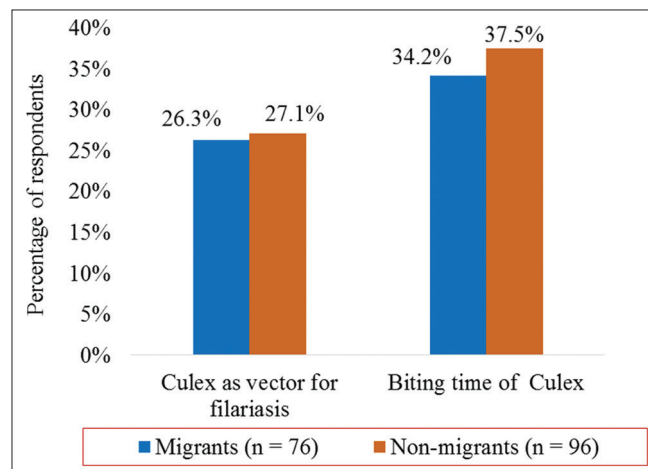
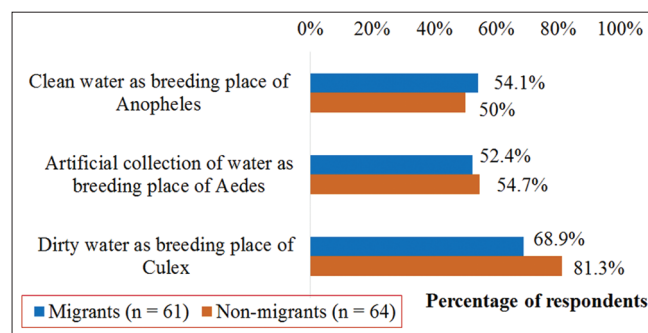
It was observed that breeding places in and around the houses of migrants were significantly higher as compared to non-migrants [Table 2].

DISCUSSION

The present community-based cross-sectional study was conducted to know the knowledge regarding MBDs and mosquitoes among migrants and non-migrants of Surat city. In the present study, the majority (46%) of migrants belonged to Uttar Pradesh and Bihar. Majority of migrants (40%) and non-migrants (36%) were in the age group of 31–40 years. These findings were similar to a study which was done in Delhi.^[6] Another study of Delhi conducted by Kohli *et al.* reported lesser proportion (28.6%) of participants between 30 and 39 years of age.^[7] Most of the migrants (27.5%) studied up to secondary and non-migrants (21%) up to higher secondary school. In a study conducted in Delhi, majority (24%) of the participants were illiterates.^[7] Another study conducted in Lhasa (Tibet) also reported that majority (34.9%) of the participants had completed their primary school education.^[8] Higher number of migrants (38.5%) belonged to lower middle class and non-migrants (39%) belonged to upper middle class. Higher number of non-migrants (49.5%) had outdoor sleeping habits as compared to migrants (39.5%).

Table 2: Observatory findings

Variables	Migrants 200 (100%)	Non-migrants 200 (100%)	χ^2 , P value (df = 1)
Breeding places of mosquitoes observed in the house	41 (20.5%)	26 (13%)	4.03, 0.04
Breeding places of mosquitoes observed around the house	39 (19.5%)	24 (12%)	4.23, 0.03
Adult mosquitoes seen in the house	23 (11.5%)	12 (6%)	3.78, 0.05

**Graph 6: Knowledge about filariasis vector and its biting time****Graph 7: Knowledge about breeding places of vectors**

In the present study more than two-third of the participants, i.e., 67% among migrants and 73.5% among non-migrants were able to name at least one MBD. More than three-fifth of the respondents named malaria while knowledge about dengue being a MBD was found to be significantly higher among non-migrants as compared to migrants ($P = 0.01$). These findings can be compared with another study conducted by Patel *et al.* in Rajkot where it was found that more than three-fifth (62%) of the participants had knowledge that malaria is transmitted by mosquitoes.^[9] The reason for higher awareness about malaria, dengue in the present study may be endemicity of the diseases in Surat and awareness campaigns conducted by Government and municipal authorities. Significantly, higher number of non-migrants was aware of “fever with chills/rigor” as compared to migrants ($P = 0.04$), while as a symptom of malaria “fever” was mentioned by significantly higher number (28%) of migrants as compared to non-

migrants (19%) ($P = 0.03$). As compared to the present study, higher awareness about the symptoms of malaria among the participants was seen in a study conducted in Ethiopia where fever and chills were most frequently mentioned symptoms reported by 94.4% and 93.3% of the participants, respectively.^[10] When asked about the symptoms of dengue, there was no significant difference in the knowledge among migrants and non-migrants.

Present study findings report that a higher proportion of participants knew that malaria and dengue are MBDs as compared to people having knowledge about symptoms of respective diseases. This could be because people are not fully aware about MBDs except that mosquito cause them.

The present study reports that a higher proportion of non-migrants (48%) knew that different types of mosquito exist as compared to migrants (38%). Among them higher number of migrants knew the correct vector of malaria (migrants [44.7%] and non-migrants [40.6%]) and its biting time (migrants [46.1%] and non-migrants [41.6%]), while higher proportion of non-migrants had knowledge that Aedes is vector for dengue (non-migrants [61.5%], and migrants [51.3%]) and also knew its biting time (non-migrants [65.6%] and migrants [42.1%]). Higher proportion of non-migrants knew that Culex is vector for filariasis (non-migrants [27.1%] and migrants [26.3%]) and also knew its biting time (non-migrants [37.5%] and migrants [34.2%]). Studies conducted in Ethiopia and Pakistan have reported a higher proportion of participants as compared to present study which mentioned mosquito bite as the cause of malaria and dengue, respectively, while a study from South India reported the lesser proportion of participants who mentioned mosquito bite as the cause of filariasis as compared to the present study.^[10-12] None of the other studies conducted explored the knowledge of mosquito type among study participants. The reasons for the majority of the participants being unaware of the existence of different types of mosquito could be either due to their educational background or lack of effective IEC programs regarding MBDs such as malaria, dengue, and filariasis.

In the present study, more than half of the migrants and non-migrants replied that mosquitoes lay eggs and among them more than half of the participants in each group mentioned water as the breeding place for mosquitoes.

Among them, a higher proportion of migrants had knowledge about the breeding habit of *Anopheles*, and a higher proportion of non-migrants had knowledge about the breeding place of *Aedes* and *Culex*.

The findings of the present study can be compared with another study conducted in Rajkot *et al.* where more than half (54.2%) of the participants mentioned drains or polluted water as the breeding places of mosquitoes.^[9] As per the findings of a study conducted in Ethiopia, stagnant water was identified by majority (91.6%).^[10] Study conducted by Ghosh *et al.* in West Bengal reported that two-third (66.67%) of the people identified polluted water of drains as a major source of mosquito breeding.^[13] Not all the participants knew about the egg-laying habits of mosquitoes and even among those who were aware, not all knew the breeding habits of mosquitoes. Knowledge about the breeding habits is important to prevent breeding places in and around the vicinity of the house and hence prevent MBDs. The present study findings highlight the fact that people are not fully aware of factors favorable for transmission of MBDs. This could lead to an increase in potential and active breeding sites in and around their surroundings.

Findings of the present study report that breeding place/s of the mosquitoes in and around the house were observed in the significantly higher proportion of migrant as compared to non-migrant families. Adult mosquitoes were seen in the houses of 11.5% migrants and 6% non-migrants. The present study findings can be compared with a study conducted in Delhi by Anand *et al.* which reports that on house visit, majority of the houses (56%) had potential mosquito breeding sites in and around the house, and adult mosquitoes were seen in nearly two-third (67%) of the houses of the participants.^[6] Breeding sites (active and/or potential) in and around the houses indicate a high risk of transmission of MBDs such as malaria, dengue, and filariasis.

CONCLUSION

This study reported that overall, non-migrant respondents had higher knowledge about MBDs and mosquitoes as compared to the migrant respondents. Only a few participants had correct knowledge about the type of water in which vector for malaria and dengue breed. Hence, the presence of breeding sites could be due to lack of knowledge of the breeding sites of mosquitoes or lack of transformation of knowledge into action.

Recommendations

The data generated by this study can serve as useful baseline information for future studies. Awareness programs should be targeted specifically toward migrants in their local language, especially in areas dominated by the migrant population as overall knowledge regarding MBDs and mosquitoes was found to be less in the migrant population. There is a need to intensify the awareness programs to educate the community about symptoms of MBDs so that they can identify the disease at an early stage and seek medical care.

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