

## Knowledge, Attitude and Practice (KAP) About Malaria Among Inhabitants of a Slum Area of Karachi

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### Abstract

**Objective:** To assess the KAP regarding malaria among inhabitants of slum area of Karachi.

**Methods:** A community based comparative cross sectional study was conducted in a slum area of Karachi i.e. Arafat town, for a period of seven months from Oct 2011 to April 2012. Total 151 inhabitants of Arafat Town were included and interviewed by trained Lady Health Worker using structured questionnaire, comprising of three components i.e. KAP about malaria. Individuals who scored more than 70% were labeled as having satisfactory KAP. Proportions of score regarding KAP were compared with one another and also with demographic variables by using chi-square test.

**Results:** Most of the participants were married female, having mean age of  $33.87 \pm 7.5$  years. Large proportion (97%) of sample had satisfactory attitude as compared to knowledge (50%) and practice (59%). Difference in knowledge and practice was found to be significant ( $p=0.040$ ).

**Conclusion:** Inhabitants of Arafat Town, had positive attitude towards prevention of malaria, but their levels of knowledge and practice were found to be low, may be due to low literacy rate or poor socio-economic condition or both. Prompt interventions are required to enhance their knowledge and practice and thus ultimately would reduce the burden of malaria.

**Keywords:** Knowledge, attitude, practice, malaria, Karachi. (AASH & KMDC 18(2):79;2013).

### Introduction

Malaria is one of the most widespread, potentially fatal infectious diseases<sup>1</sup>. It is a tropical disease caused by protozoan parasites of the genus *Plasmodium*<sup>1,2</sup>. It is the major cause of morbidity and mortality in tropical and subtropical regions of the world<sup>3</sup>. An estimated 300-500 million clinical cases of malaria occur each year globally<sup>1,4</sup>. Approximately half of the world's population is at risk of malaria<sup>5</sup>.

According to world malaria report 2011, there were an estimated 216 million cases of malaria and 655,000 malaria deaths occur worldwide in 2010<sup>6</sup>. Approximately 15% of the population of Pakistan

live in the region of high transmission ( $\geq 1$  case/ 1000 population) while 84 % in the area of low transmission (0-1 case/ 1000 population)<sup>6</sup>.

At least 39 districts, mainly from the two southern provinces of Sindh & Baluchistan, have been classified as high risk<sup>7</sup>.

The control programs still face many challenges include low coverage by long-lasting insecticidal nets or indoor residual spraying, weak malaria surveillance system and insufficient well trained human resources limited implementation of the updated malaria treatment policy for artemisinin-based combination therapies<sup>8</sup>. Malaria can decrease gross domestic product by as much as 1.3% in countries with high disease rates<sup>5</sup>.

Many of the human behaviors (poverty, population mobility, agricultural and industrial development) favor malaria transmission stem from broad social, cultural and economic forces. In addition to these

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broad social forces, malaria transmission and control are invariably affected by local beliefs, attitudes and practices. Careful involvement of community members can overcome some of these potential problems and thus can greatly increase the realization and sustainability of malaria elimination programs<sup>1,9</sup>. Community knowledge and practice had been proven to play important role for the implementation of effective and sustainable interventions against malaria<sup>10,11</sup>. Many studies were done to assess the knowledge, attitude and practice (KAP) of communities towards malaria worldwide, mainly in Africa, indicate that malaria is perceived as a serious problem<sup>12</sup>. Knowledge about malaria in African population was calculated to be high (ranges from 80 - 93%)<sup>3,13</sup> while it was found to be inadequate and needed to be improve in Malaysia and Iran<sup>2,14</sup>. In semi urban population of Rawalpindi, 72% of the community members found to have adequate knowledge regarding malaria<sup>15</sup>. Despite high level of knowledge about mosquito as causative agent of malaria, only 44% of the rural population of Tigray was practicing the preventive measure against malaria preferably bed nets<sup>16</sup>.

We have gone through several international and local studies regarding assessment of KAP about malaria of different population, no study as such reported the overall knowledge and practice, and rather proportions of each variable separately had been calculated.

Despite the steps taken by health system authorities against malaria, its epidemics still reported in our region. Since malaria is a disease which can effectively be prevented if all personal and community preventive measures are taken in time. This study gathered information about what people think and how they respond against malaria, as the assessment of community knowledge and practice is a basic steps towards malaria control program. It would be helpful in future counseling and health education in order to have an effective control of malaria. The objective of this study was to assess the knowledge, attitude and practice (KAP) regarding malaria among inhabitants of a slum area of Karachi.

## Subjects and Methods

It is a community based comparative cross sectional study conducted in a squatter settlement, Arafat Town having a population of 20000, situated in North Nazimabad district of Karachi<sup>17</sup> and served by primary health care centre associated with a medical college for last one decade. Duration of the study was seven months from October 2011 to April 2012. Total 151 inhabitants of Arafat Town were included by convenient sampling in the study, as calculated by using one sample size equation of WHO sample size software<sup>18</sup>.

All the adult community members (aged > 18 years) depending on availability at the time of interview of either sex and living in Arafat Town for last 3 years or more, were included in this study and the community members who refused to participate in the study or found to be associated with health system were excluded from the sample.

The Ethical Review Board of KM&DC approved the study. Informed written consent was also taken from each participant and the purpose of study was explained.

The data was collected by the structured questionnaire having demographic profile, KAP components, correct answer of each question was given one mark; score regarding knowledge, attitude and practice component aggregated separately and then their proportions were calculated. Individuals who scored 70% or < 70% were labeled as "satisfactory" or "unsatisfactory" respectively.

The questionnaire was administered in urdu (local language of Pakistan) by departmental lady health worker who had been trained specially for that purpose. Standardized pattern of inquiry was devised in order to minimize interviewer bias.

All the data was entered in SPSS version 16.0. Descriptive statistics for continuous data (age); mean and standard deviation were calculated, and all the remaining categorical data summarized in the form of frequencies and proportions.

Proportions of each outcome variables (knowledge, attitude & practice) were compared with demographic variables and also with one another by applying chi-square test to see the association between them. Fisher Exact test was used to compare the variable of attitude with others because chi-square was found to be inapplicable due to inappropriate cell count.  $P < 0.05$  was considered as significant.

## Results

The mean age of participants was  $33.87 \pm 7.5$  years, mostly married (94%) & house wives (72%). Among the respondents, female were twice as male. Regarding their educational status 41.7% had no education. Most of study participants i.e. 59% belonged to low socioeconomic group as they had monthly income less than 5000.

About 60% gave a positive past history of malaria. Doctors were found to be the most common source of information (91%) regarding knowledge about malaria and only 7% of the participants got information through electronic media.

While assessing the knowledge component, most of our study participants i.e. 65.6% thought that malaria cures in weeks. About 6.6 % had knowledge that malaria occur during monsoon season while 50% opine that most of the malaria cases occur in summer. Almost all of the participants i.e. 97% correctly relate the malaria with mosquito bite and mentioned that mosquitoes grow in stagnant water and bite mainly during night time. About 13% and 25% of respondents thought that malaria mainly affects women and children respectively. On asking about the sign & symptoms of malaria, all of the participants recognized fever while shivering and headache were mentioned by 99% and 97% of respondents respectively.

When we aggregated the score of correct answer, it was found that only half of the participants had satisfactory knowledge (scored  $\geq 70\%$ ) regarding occurrence, transmission, sign/symptoms, diagnosis and preventive measures against malaria.

Knowledge about the treatment was insufficient, not a single participant was able to name any one of antimalarial drug.

Despite the low frequency of participants about knowledge, almost all of the inhabitants (97%) showed satisfactory attitude towards malaria.

While assessing the practice regarding malaria, it was found that use of lab test for the diagnosis was limited and door & windows of no house was found to be screened with nets. Overall 59% of participants scored  $> 70\%$  regarding practice of preventive measures for malaria.

Proportion of participants who had satisfactory Knowledge and practice were compared with various demographic variables as shown in table 1 and 2 respectively. It was noticed that knowledge was significantly associated with level of education ( $p=0.007$ ) and socioeconomic condition ( $p=0.030$ ). Statistically significant difference was found between knowledge & practice as shown in table 3. Various variables were compared by using chi square test and malaria was found to be more common among male ( $p=0.005$ ). We found that the knowledge about the diagnosis ( $p=0.005$ ) and time to cure ( $p=0.008$ ) were high among the participants who had an episode of malaria previously.

Participants who had knowledge about preventive measures for malaria were using anti mosquito spray effectively ( $p=0.001$ ) and those who had knowledge about season of malaria were taking preventive measures in right time ( $p=0.001$ ).

## Discussion

Our study population was found to be similar to the population of the study in rural Tigray, Ethiopia with respect to age, distribution of gender and marital status<sup>16</sup>. Relationship of knowledge with stratified age groups and gender was not found to be statistically significant in the study in contrast to the study of Tanzania because of the difference in gender distribution of two studies<sup>19</sup>.

More than two fifth of participants were found to be uneducated and only 16% completed primary

school, similar to the study conducted in Eastern India<sup>15</sup>. Level of knowledge was increasing with increased level of education ( $p=0.007$ ), thus highlighting the importance of education to create awareness about health. There was no statistically significant difference found in our study between the literacy rate and practice against malaria as found in the study of Iran ( $p<0.05$ )<sup>14</sup>.

Knowledge regarding malaria was found to be significantly higher ( $p=0.03$ ) among middle socio-economic group, probably due to the fact that this group is more conscious about its health status because of the high proportion of educated respondents in this group. Frequency of malaria i.e. 59% in our study participants was close to the finding of studies conducted in Ethiopia,<sup>13</sup> and Indonesia<sup>20</sup>.

Most of them (91%) got knowledge about malaria from doctors and only 7% from electronic media. Our finding is inconsistent with a study of Calabar<sup>21</sup>. Even though exclusive health channels have been introduced in our society but their role is marginal in promoting awareness on malaria. No study in the area has yet been carried out to identify an effective media to disseminate the public message for provision of knowledge about malaria.

Most respondents (65.6%) gave opinion that malaria takes weeks to cure, in Java 87% of cases were found to be cured within three days of start of medication<sup>20</sup>. Difference may be due to consultation with doctors after the development of complications, due to which more time is required to resolve the problems. Delay in consultation may be due to lack of awareness or difficulty in approach to a health service.

Only 6.6% of our study participants had correctly identified monsoon as the peak season of malaria occurrence while half of the respondents, though less than that found in the study of Rawalpindi, misinterpreted that malaria usually occurs in summer season<sup>15</sup>. This high proportion of finding may be due to fact that most of the respondents were illiterate & were unable to differentiate between the season of monsoon and summer.

Majority of our study participants (97%) recognized mosquito as vector of malaria almost similar with the finding of study in Swaziland, Nigeria and Tanzania<sup>19,22</sup>. It was found to be higher than in Rawalpindi & Ethiopia<sup>15,16</sup>, may be because rural sample of above mentioned studies generally considered having less knowledge than urban dwellers.

Level of knowledge regarding breeding place for mosquito in our study was far above the knowledge of study participants in Iran, Tanzania, Southern & central Ethiopia<sup>14,13,21,10</sup>. The difference in the knowledge may be due to the fact that our study was conducted just after the epidemic of Dengue fever and there were plenty of public announcements and banners displayed at various places about the causes and preventive measures against it.

Knowledge about the time of mosquito bite was higher (97%) than in respondents of Central & Southern Ethiopia<sup>10,13</sup>, attributed to high educational status.

One quarter of respondents thought that malaria occur most frequently in female while only 13% had idea that children are also at high risk for malaria lower than the population of Ethiopia, may be due to the fact that activities of malaria control program in Ethiopia might have enhanced their level of knowledge<sup>10</sup>.

Respondents of our study had excellent knowledge about sign & symptoms of malaria. All of them mentioned that there is fever in malaria, 99% & 97% stated that shivering and headache also occur in malaria respectively, consistent with the study of Iran & Indonesia<sup>14,20</sup>.

About 87% of the participants claimed that they knew preventive measures against malaria and 99% agreed with the usefulness of preventive measure. Finding is little higher than the study carried out in Swaziland & Ethiopia<sup>3,13</sup>. Because in our study setup, primary health care centre is functional for last ten years and may be effective in promoting primary preventive measures. Furthermore our study population was usually taking preventive

measures themselves, while in Swaziland, most of the people are dependents on interventions by the Malaria Control Program for protection against malaria<sup>3</sup>.

One of the cheapest methods to get rid of mosquitoes is coil. While assessing the attitude, it was found that most of the people (96%) would prefer coil and IRS, while 90% would like to use door nets and bed nets as well. Study of Paulander and Iran showed the same result<sup>16,14</sup>. Proportion to consult allopathic doctors and willingness to get more information about malaria (99%) was similar in our study as in Rawalpindi<sup>15</sup>.

About 97% of the respondents were practicing more than one method of prevention. It was found that 85% were using bed nets. Use of IRS was found to be very close to the result of Nigeria<sup>19</sup>. Use of anti mosquito spray was found to be significantly higher as compared to several other measures among those who claimed to have knowledge about preventive measures against malaria (p= 0.001). It may be either due to its easier use or the

**Table 1. Association between knowledge of malaria with demographic variables in a slum community of Karachi (n = 151)**

Variables	Knowledge		p value
	Satisfactory (score 70%)	Unsatisfactory (score < 70%)	
<b>Age in years</b>			
35	48	44	0.572 <sup>#</sup>
> 35	28	31	
<b>Gender</b>			
Male	24	17	0.218 <sup>#</sup>
Female	52	58	
<b>Education</b>			
Uneducated	30	33	0.007 <sup>***</sup>
<primary	11	14	
Primary	14	23	
Metric	16	02	
>metric	05	03	
<b>Socioeconomic condition</b>			
Low			0.030 <sup>**</sup>
Middle	37	52	
High	33	18	
	06	05	

#chi square value; \*\* p<0.01 considered as highly significant

**Table 2. Comparison of practice regarding malaria with age, gender, education, socio economic condition and attitude in a slum community of Karachi (n = 151)**

Variables	Practice		p value
	Satisfactory (score 70%)	Unsatisfactory (score < 70%)	
<b>Age in years</b>			
21-35	49	43	0.076 <sup>#</sup>
36-51	40	19	
<b>Gender</b>			
Male	28	13	0.154 <sup>#</sup>
Female	61	49	
<b>Education</b>			
None	12	24	0.661 <sup>#</sup>
< primary	22	13	
Primary	10	15	
Metric	06	08	
>metric		02	
<b>Socioeconomic condition</b>			
Low	51	38	0.874 <sup>#</sup>
Medium	31	20	
High	07	04	
<b>Attitude</b>			
Satisfactory	87	60	0.713 <sup>^</sup>
Unsatisfactory	02	02	

#chi square test, ^ Fisher Exact test

**Table 3. Comparison of knowledge with attitude and practice regarding malaria in a slum community of Karachi (n = 151)**

Variables	Knowledge		p value
	Satisfactory (score 70%)	Unsatisfactory (score < 70%)	
<b>Attitude</b>			
Satisfactory	75	72	0.306 <sup>^</sup>
Unsatisfactory	01	03	
<b>Practice</b>			
Satisfactory	51	38	0.040 <sup>**</sup>
unsatisfactory	25	37	

<sup>^</sup> Fisher Exact test applied; <sup>#</sup> Chi-square applied; \* p<0.05 considered as significant

low price of certain anti mosquito spray. We could not ask about the type of spray used.

Regarding practice, not a single house was found with screening in doors and windows, because most of our study population was on rent and they would be reluctant to spend money on house. Frequency of those who used anti mosquito mat was more than double in Rawalpindi than our study<sup>15</sup>. It may be due to the ignorant behavior and lack of knowledge about available preventive measures. Surprisingly, the proportion of participants with satisfactory practice were found to be higher and statistically significant ( $p=0.040$ ) than those with satisfactory knowledge. It may be because of the fact that just before and during the period of data collection, there was an epidemic of dengue fever in Pakistan and mortality due to that was reporting very high, which made the people more conscious about the practice of preventive measures and their health. We did not specifically ask that whether they were taking measure against dengue or malaria.

Proportion of participants was found to have higher attitudes than their knowledge and practice towards preventive measures against malaria but the difference was proven to be statistically insignificant. Reasons of limited practice of prevention may include lack of education or low socio economic condition.

It was found that 60% had malaria and 62% took anti malarial treatment at least once in their lifetime and all of them reported to complete the course as prescribed, finding was slightly lower in a study conducted in Java<sup>20</sup>. Though 99% of the respondents had knowledge about blood test for malaria, only 9.9% had actually been gone through the blood test for malaria. It may be attributed to negligence behavior of health providers in order to update them regarding diagnosis and treatment of malaria according to WHO Guidelines.

Over all in our study it was found that 50% of respondents had satisfactory knowledge, much lower than in the respondents of a study conducted in Rawalpindi<sup>15</sup>. It may be due to the difference in cri-

teria used to assess the level of knowledge in the studies.

The limitations of this study include lack of probability sampling due to improper and over congested housing scheme of Arafat town may affect the generalization of our results. Close ended questions in the Performa may be a source of bias. An ideal design would be focal group discussion. The study was conducted during and just after the period of epidemics of dengue; this may mislead the conclusion about the knowledge and awareness of the participants. Comparison of overall knowledge with attitude and practice was not found in any study which limits the generalization of results. Therefore further studies with this pattern are recommended in future. The participants recognized malaria as a preventable disease even then its frequency was found to be high directing towards the need of prompt interventions to upgrade the knowledge and enhance practice of community members regarding effective preventive measures against malaria by using clinical vignettes or other educational strategies. By means of these methods burden of malaria can be reduced from this community.

## Conclusion

This study revealed that the people of a slum area in Karachi had positive attitude as compared to their knowledge and practice towards preventive measure of malaria. Low literacy rate and poor socioeconomic condition may contribute to the lack of knowledge and practice.

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