

ORIGINAL ARTICLE

Assessment of Knowledge, Attitude and Practices of Malaria among mothers of patients from 5 to 15 years of age in the District Bahawalnagar, PakistanMUHAMMAD REHAN¹, SANA SADDIQUE¹, SALEEM AHMAD², SHUMAILA NARGUS¹, RUHAMAH YOUSAF¹¹University Institute of Public Health, University of Lahore, Pakistan²Department of Community Medicine, University college of Medicine and dentistry, University of Lahore, PakistanCorresponding author: Shumaila Nargus, Email: dr_shumailanargus@yahoo.com, Cell: +923311450183**ABSTRACT****Background:** Malaria continues to be a serious global public health and development issue. Plasmodium falciparum, the most lethal type of the malaria parasite, is responsible for the great majority of malaria-related death and morbidity in children.**Aim:** To ascertain malaria knowledge, attitudes, and practices among mothers of patients aged 5 to 15 in the district of Bahawalgar, Pakistan.**Methods:****Study Design:** Cross sectional Descriptive study.**Settings:** The study was done at District health quarter hospital Bahawalnagar.**Duration of Study:** The duration of study was 9 months from October to June. A questionnaire was used to collect the data from mothers of patients visiting medical OPD. Data was analyzed with SPSS version 25.**Results:** Findings of the study showed that a total of 241 malaria infected children were studied, to observe their plasmodium prevalence and their parental KAP of malaria. Most common age group of children was 13-15 years among 56.0%. Female's children were commonest as 63.9%. Most of parents 46.1% were found with intermediate education. P-vivax was P-vivax was mostly seen among 66.4% children followed by p-falciparum 17.4%, p-malariae 3.3% and Plasmodium Vivax + falciparum 12.9%. The prevalence of plasmodiums was insignificantly related to demographic characteristics, with p-values that were relatively low.**Conclusion:** The study concluded that plasmodium vivax was the most prevalent malarial parasite. Parents had partial knowledge regarding malaria and its treatment. Parents had good attitude and agreed to participation in its prevention.**Keywords:** Malaria, parents, knowledge, practice, children's mothers**INTRODUCTION**

The underdeveloped world is struggling with morbidity and mortality significantly, due to malaria.¹ It is a life threatening disease, transmitted in human by the sting of Anopheles (a female mosquito)²⁻³. The rainy season (November -April) highly favors the transmission of malaria⁴. In Afghanistan and Iran border 37% death occur by malaria⁵. Children below five years of age and pregnant females are most commonly affected by malaria, due to malaria globally 306 thousand children aged<5 years died and in African region approximately two third of deaths occurred⁶. According to WHO in children 9 out of 10 deaths caused by malaria in Africa region³.

In Kenya malarial infection is the major cause of mortality and morbidity⁷ where out of 34 million individuals 25 million are projected to be at malarial risk, which is >70% individuals at risk⁸. To overcome malaria rate by introducing media and BCC, there are well established and validated strategies that improve the likelihood for a successful outcome in malaria-related programmes⁹. Malaria continues to have a terrible effect on people's health and livelihoods all over the world despite being preventable and treatable. According to the most recent world malaria report, there were 409,000 fatalities and 229 million cases of malaria worldwide in 2019¹⁰.

Mordecai EA et al in 2015, around 214 million cases and 438000 deaths were subjected to malaria. Morbidity and mortality rate so much control in 2015¹¹. Zgambo M et al stated that globally, disease rate of malaria decrease by 37% from 2000 to 2015, global mortality decreased by 60% but, still most of world population is at a high risk of malaria¹². Further similar study done in Nigeria Uzochukwu V et al¹³.

Another study done in Pakistan which also showed that male were more affected than female, male were predominant victim of malaria were also reported in Gadap region Pakistan¹⁴. S. C. Uzochukwu, E. O et al stated that more than 42% of the

respondents were unaware of malaria.¹⁵ There have been numerous reports from various regions of Ethiopia about the knowledge, attitudes, and practises surrounding malaria and its control. The report came to the conclusion that malaria control measures have not been effective and that there are still misconceptions regarding the origin and spread of the disease.¹⁶ Agnandji ST et al increased medical technologies have resulted in deeper comprehension of the significance of MA as a significant risk of extreme malaria, regardless of the fact that clinical associations (deep breathing) have been known for decades¹⁷.

One of the main causes of hospitalization and fatalities in the nation, malaria is still a major public health issue.¹⁸⁻¹⁹ Various reports on the knowledge of malaria in various regions of Africa and around the world indicate that a knowledge gap about the condition of the malaria disease may prevent people from actively participating in the control programs²⁰. To build collaboration between public activities, primary healthcare physician, and nongovernmental/governmental malaria coordinated a control initiative in Bahawalnagar District, it is important to decide the malaria associated KAP of the population and their regulation.

This study will provide fresh knowledge regarding prevalence of most common malarial parasites and knowledge, attitude and practices of parents/attendants of malaria patients 5 to 15 years of age in district Bahawalnagar including malarial parasite association with different demographic variables. Strategies can be developed after this study of knowledge, attitude and practices of parents/attendants of malaria to prevent the malarial morbidity and mortality linked to most common malarial parasite.

The objectives of study were to determine the prevalence of malaria and assess knowledge, attitude and practices of parents/attendants of malaria patients 5 to 15 years of age in district Bahawalnagar.

Hypothesis: Plasmodium vivax is the most prevalent malarial parasite and there is a partial parental knowledge regarding malaria and its treatment.

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METHODS

This cross sectional descriptive study was conducted at DHQ, Hospital, Bahawalnagar. The duration of study was 9 months after approval of synopsis. 241 subjects were taken using 6% prevalence of complicated malaria by using standard formula. Sampling Technique: used was non probability convenient sampling technique.

Where:

Level of confidence that is 95%
 Confidence interval is 5%
 Whereas,
 P is proportion of patients with uncomplicated malaria is 6%

Therefore, the sample size was:

$(1.96)^2 \times 0.06 (1-0.06)$
 $(0.03)^2$
 241 respondents will be approached for the study.

Inclusion Criteria:

- Age between 5- 15 years
- Mothers of Both gender
- Permanent Resident of Bahawalnagar.
- Patients having the history of intermittent fever with shivering.

Exclusion Criteria: Patients with impairments that prevent them from communicating, people who are gravely ill or mentally ill, and people who refuse to give consent or assent were excluded from the study.

Data Collection: The study was carried out in Medicine OPD of DHQ hospital Bahawalnagar. Permission has been taken from Medical Superintendent of hospital; Total 241 male and female patients were examined during the 9th month of study period. The consent of study subjects were taken from their mothers / guardians.

All the information regarding variable of study like age, gender, education was obtained through a questionnaires consist of close ended question.

In order to gather information on sociodemographic characteristics, knowledge and attitudes of the study participants about malaria, symptoms, preventive measures, and practises, a standard KAP modified and adapted questionnaire from similar previous studies was filled from the mothers of patients visiting to medical OPD with symptoms and a Malaria Parasite slide positive had a history of fever for three to five days with shivering, nausea and vomiting, excessive sweating, and chills.

Data was analyzed with SPSS version 25. Categorical data was computed as frequency and percentage. Chi-square test was applied and a p-value <0.05 was taken as significant.

RESULTS

In this study total 241 malarial infected children were studied, to observe their plasmodium prevalence and their parental KAP of malaria.

Table 1: Children according to age groups (n=241)

Age group	Frequency	Percent
5-8 years	11	4.6%
9-12 years	95	39.4%
13-15 years	135	56.0%
Total	241	100.0%

Most common age group of children was 13-15 years among 56.0% children followed by 9-12 years 39.4% and 5-8 years 4.6% (Table 1).

Table 2: Children according to age gender (n=241)

Gender	Frequency	Percentage
Female	87	36.1%
Male	154	63.9%
Total	241	100.0%

Female's children were commonest as 63.9% and males were 36.1%.

Table 3: Parental educational status (n=241)

Mother education	Frequency	Percentage
Illiterate	49	20.3%
Matriculation	81	33.6%
Intermediate	111	46.1%
Total	241	100.0%

Most of parents 46.1% were found with intermediate education, 33.6% were matric passed and 20.3% were illiterate.

Table 4: Number of the children at home (n=241)

No of children	Frequency	Percent
1-3	81	68.5%
4-6	52	29.4%
>6	5	2.1%
Total	241	100.0%

According to the number of children at home 1-3 were 68.55, 4-6 were 29.4% and >6 were only 2.1%.

Table 5: Prevalence of malarial parasite (n=241).

Mother education	Frequency	Percentage
Plasmodium vivax	160	66.4%
Plasmodium falciparum	42	17.4%
Plasmodium malariae	8	3.3%
Plasmodium Vivax + falciparum	31	12.9%
Total	241	100.0%

According to the prevalence of malarial plasmodium, P-vivax was mostly seen among 66.45 children, p-falciparum was seen in 17.4% patients, p-malariae was found 3.3% and Plasmodium Vivax + falciparum was found 12.9%.

Table 6: Parental knowledge regarding malaria (n=241)

knowledge regarding malaria		Frequency	Percent
What is malaria	Bacteria	64	26.6%
	Virus	38	15.8%
	Protozoa	37	15.4%
	None	102	42.3%
	Total	241	100.0%
How does spread	Mosquito	141	83.8%
	Fly	24	5.0%
	Don't know	76	11.5%
	Total	241	100.0%
Do you know resting	Dark place	19	7.9%
	Dirty area	92	38.2%
	On edge of pound	51	21.2%
	Cattle shed	54	22.4%
	Don't know	25	10.4%
	Total	241	100.0%
How malaria can prevent	Environment management	30	12.4%
	Insecticide treated bed net	67	27.8%
	Indoor residual spray	40	16.6%
	Prophylaxis	41	17.0%
	Don't know	63	26.1%
Total	241	100.0%	

According to the knowledge regarding malaria, 26.6% were known that is a bacteria, 15.8% answered it is a virus, 14.4% replied it a protozoa, while 42.3% were lack of knowledge. 83.8% had correct knowledge as malaria caused by mosquito, 5.0% known that it may cause by flies and 11.5% did not know. Regarding resting of mosquito most of the parents answered that it rest on dark places, dirty areas and on edge of the pound, while 10.4% did not knowledge. According to the prevention 27.8% agreed with Insecticide treated bed net, 16.6% agreed with indoor spray, 12.4%-17.0% parents were in favor of environmental management and prophylaxis, while 26.1% did not knowledge.

Table 7: Parental attitude regarding malaria prevention (n=241)

Attitude regarding malaria prevention	Frequency	Percent	
Is malaria serious health issue	Yes	166	68.9%
	No	75	31.1%
	Total	241	100.0%
Would you see bed net	Yes	84	34.9%
	No	157	65.1%
	Total	241	100.0%
Your first action if your child	Consult a doctor	101	41.9%
	Home internet	75	31.1%
	Do nothing	65	27.0%
	Total	241	100.0%
	Yes	125	51.9%
Have you participated	No	116	48.1%
	Total	241	100.0%
	Chloroquine	53	22.0%
Best treatment for vivax mal	Paracetamol	84	34.8%
	Don't know	104	43.2%
	Total	241	100.0%

According to parental attitude 68.9% were said that this is a serious health issue and 31.1% were taking it lightly. On bed net question 34.9% parents agreed. On first action question most of the parents answered they will prefer the doctor. 51.1% parents were agreed to participate in malaria prevention. According to the treatment most of the parents were unknown, 22% answered chloroquine and 34.8% had knowledge of paracetamol.

According to the parental preventive practice most of the parents directly comes to the government and private doctor, while 16.2% came after self-medication. According to the protective measures mostly they were using mosquitoes repellents, followed by use of mosquitoes nets, close windows and door, wear long sleeves shirt and burn cow dung. According to the preventive

measures 32.4% insecticide spraying, 26.1% avoiding stagnant water collection, 14.1% wearing full sleeves shirts and 27.0% using proper hygiene and continuous education. 45.2% using protective cloths.

Table 8: Parental practice regarding malaria prevention (n=241)

Practice regarding malaria prevention	Frequency	Percent	
Whom you do contact	At home with self-treatment	39	16.2%
	Doctor at govt Hospital	152	63.1%
	Private doctor	50	20.7%
	Total	241	100.0%
	Use of mosquitoes nets	25	10.4%
Which protective measures	Mosquitoes repellents	73	30.3%
	Close windows and door	30	12.4%
	Burn cow dung	45	18.7%
	Wear long sleeves shirt	68	28.2%
	Total	241	100.0%
Which preventive measures	Avoid stagnant water collection	63	26.1%
	Insecticide spraying	76	32.4%
	Wear full sleeves shirts	34	14.1%
	Proper hygiene and continuous education	65	27.0%
	Not any	4	4.0%
What is time you seeking	Total	241	100.0%
	During day time	117	48.5%
	Total	241	100.0%
Do you wear protective cloth	Yes	109	45.2%
	No	132	54.8%
	Total	241	100.0%

Table 9: Prevalence of malarial plasmodium according to demographic variables (n=241)

Variables	Malarial parasite				Total	p-value
	Vivax	Falciparum	Malariae	vivax+ falciparum		
Parental education						
Illiterate	33	9	1	6	49	0.876
Matriculation	56	13	4	8	81	
Intermediate	71	20	3	17	111	
Total	160	42	8	31	241	
Gender						
Male	60	18	3	6	87	0.192
Female	100	24	5	25	154	
Total	160	42	8	31	241	
Age groups						
5-8 years	8	3	0	0	11	0.587
9-12 years	64	14	2	15	95	
13-15 years	88	25	6	16	135	
Total	160	42	8	31	241	

Prevalence of plasmodium's were insignificantly associated to demographic variables p-values were quite insignificant.

DISCUSSION

Malaria-infected children were evaluated in this study to determine their plasmodium prevalence as well as their parents' malaria knowledge, attitude, and preventative practices. The most prevalent age group of children was 13-15 years among 56%, followed by 9-12 years 39.4% and 5-8 years 4.6%, with females outnumbering men by 63.9% to 36.1%. In comparison to our findings, Hussain K et al²¹ found that male children were 65.21% (150/230), or two times more likely to be impacted than female children (34.78% (80/230)). The prevalence was 7.41% (n=89/1200) in preschool-aged children aged 1-5 years, 7.11% (n=75/1054) in school-aged children aged 6-10 years, 6.78% (n=46/678) in children aged 11-15 years, and 6.66% (n=20/300) in children aged >15 years.

A research conducted in Ha-Lambani, 22 Limpopo Province, South Africa, backs this up. Female participants were found to be more educated about malaria (69.8%) than their male counterparts (57.3%) in this study, indicating a need for male malaria

awareness creation. The finding 23 that reported a statistically significant association between practise level and gender of participants, in which a higher proportion (45%) of female participants had good malaria practise than males (28.1%); on the other hand, a significantly higher percentage (71.9%) of male participants had poor malaria practise than female participants (55%).

Pakistan, a similar greater frequency in the school age range (5-10 years) was observed²⁴. This might be due to children of this age group's increased mobility and outside activities, which increases their chances of being bitten by a mosquito and contracting malaria.

In this study, 66.45 children tested positive for P-vivax, 17.4% tested positive for P-falciparum, 3.3% tested positive for P-malariae, and 12.9% tested positive for Plasmodium Vivax + falciparum. In comparison to our findings, Khattak AA et al²⁵ found that Plasmodium infections in Pakistan are mostly caused by P. vivax, but P. falciparum and mixed species infections are also common.

In our survey, 26.6% of people knew malaria is caused by bacteria, 15.8% thought it was caused by a virus, 14.4% thought it was caused by a protozoa, and 42.3% had no idea. Malaria is

caused by mosquitos in 83.8% of cases, flies in 5.0% of cases, and flies in 11.5% of cases. Most parents stated that mosquitos rest in dark spots, dusty regions, and on the edge of the pound, while 10.4% had no idea. According to preventive, 27.8% of parents agreed with insecticide-treated bed nets, 16.6% agreed with indoor spray, 12.4%-17% agreed with environmental management and prophylaxis, and 26.1% did not know.

Sheraz jamal k et al 26 found similar results in their study. They discovered that whereas just 20% were aware of prevention and 20% were aware of the usage of nets, more than 80% were unaware of chemoprophylaxis. In this study²⁷ the probabilities of malaria infection were 26.93 and 13.09 times greater in individuals with poor knowledge and practise, respectively, than in individuals with strong knowledge and practise. A research conducted in south-central Ethiopia yielded similar results.

Participants aged 15-24 and 25-34 years old had the best knowledge. This could be because women in impoverished countries primarily care for their family members. In contrast, our findings contradict those of Ethiopian research²⁸. The findings of this study contrast the findings of studies conducted in Cabo Verde²⁹ and Myanmar³⁰, which demonstrated an increase in the scores of good knowledge and good practise towards malaria as the study participants' ages increased.

In our survey, we discovered that 68.9% of people believe this is a major health concern, while 31.1% believe it is not. On the topic of bed nets, 34.9% of parents agreed. On the first action question, the majority of parents said they would rather go to the doctor. Parents agreed to engage in malaria prevention in 51.1% of cases. According to the same survey, more than 33% of students believed that houseflies were involved in malaria.³¹ Both the general people and healthcare professionals were found to have a lack of general knowledge and understanding of the disease, its transmission, and control and prevention measures. There were still some misunderstandings concerning the mode of transmission of malaria.

In our investigation, we noticed that the majority of parents go immediately to the government or private doctor, while 16.2% go after self-medication. According to the precautionary measures, they predominantly used insect repellents, followed by mosquito nets, closing windows and doors, wearing long sleeves and shirts, and burning cow dung. Preventive strategies included 32.4% pesticide spraying, 26.1% preventing stagnant water accumulation, 14.1% wearing full-sleeved shirts, and 27% practising appropriate hygiene and education. 45.2% use protective clothing.

According to certain research, individuals utilised repellent coils, suitable clothes that covered the entire body, spray, and the removal of stagnant water from the surroundings as preventive measures³²⁻³³.

CONCLUSION

It was concluded that plasmodium vivax was the most prevalent malarial parasite. Female children mostly infected. Parents had partial knowledge regarding malaria and its treatment. Fortunately they have good attitude and agreed to participation in its prevention.

Commendations: There is a need of parental education regarding proper assessment, detecting, recording of fever and safe practicing of fever management at home. Preventive strategies and awareness program should be developed and continued all over the country with help of local population to prevent the morbidity and mortality caused by malaria.

Limitations: This was a single center and small sample size study. Many parents/guardians were not ready to consent for their children to participate into the study despite the fact that their children were ready to assent.

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