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SOCIAL, DEMOGRAPHIC FACTORS AND SMEAR POSITIVE MALARIA FREQUENCY: A CROSS-SECTIONAL RESEARCH STUDY AT TERTIARY HEALTHCARE CENTRE

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Abstract:

Objective: *The principal objective of the research was the determination of the smear positive malaria frequency and patient's socio-demographic factors who visited Civil Hospital, Khairpur (Microscopy Department)*

Methods: *This research was cross-sectional by design and it was held in the time span of four months starting from June-September, 2016. The assessment tool was a designed questionnaire for the attainment of the research objectives in the said time period and setting of the Khairpur Hospital. Research included a total of 138 cases who were prescribed by the physicians Malaria Parasite (MP) Test, we included these patients in the research through sampling consecutive method and also interviewed all the patients about their social and demographic features. SPSS-21 was used for the data entry and analysis of the research outcomes.*

Results: *In the total research sample (138) male to female ratio was respectively 55.5% male and remaining female. It shows the dominance of the male. Maximum numbers of patients were in the age group of forty years and the range of the age was in the limit of 25 – 40 years having 25 as the lowest and 40 as the highest limit of the age. Positive result of MP test was noticed in 6.5% patients with the repeated identification of Plasmodium Vivax (PV).*

Conclusion: *We conclude that Malaria is an endemic in the specified areas of District, Khairpur and Plasmodium Vivax is considered as the common most species which affects the participants who visited hospital's Microscopy Centre for the verification of MP test. There is a dire requirement of awareness about the health issues and participation of the society for the eradication of the Malaria from the communities of Khairpur.*

Keywords: *Malaria Frequency, Endemic, Microscopy, Insecticide Treated Nets and Roll Back Malaria.*

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INTRODUCTION:

Pakistan faces the endemic malaria in general and in rainy season specifically. Back in 2001 Pakistan became an active member of the WHO anti malaria Roll Back Malaria program, it also founded Microscopy centers and related facilities. Like other countries of the world, Pakistan is no exception to malaria. Children are in the range of malaria and it is counted amongst top three deadliest diseases causing one million deaths every year as it is estimated that 350 million became the victims of this disease over the world [1]. Women are badly affected due to this disease specially in the pregnancy [3]. Malaria has been eliminated from the world but Pakistan is still in the dangerous zone for the elimination of this disease. However, Kyrgyzstan and Argentina commenced the certification of the elimination of malaria in the guidelines of WHO [4]. In our region Saudi Arab and Iran has been qualified for the malaria elimination but Pakistan is still in the watch list [2]. It is reported that the incidence has dropped by thirty percent in the time span of thirteen years from 2000 – 2013 with a reduced mortality rate of forty-seven percent [6]. Pakistan documented 130,000 cases of malaria (2012), according to the WHO estimates worldwide occurrence of malaria is 350 million and 1.6 million occur only in Pakistan [7]. The causes behind malaria spread are irrigation networks, growth in the population and unusual urbanization. Malaria control activities are active in Pakistan since 1950 [8]. Most repeated species of malaria in Pakistan are Falciparum and Vivax (WHO, 2014); Furthermore, many areas are still considered as hyperendemic and majority of the children and women are under constant threat [1]. A research study of same nature was held in Sindh and it was observed that there is nine percent prevalence of smear positive malaria [9]. Recently, it is targeted in number of countries to be malaria free but in the case of Pakistan serious initiatives are necessary for the complete eradication of malaria for the achievement of the MDG 6 objectives [10].

As a result of malaria control program collapse back in 1969 it increased and again started in the assistance of WHO in 1998 and fifty percent of the malaria incidence was controlled till 2010. Malaria committee and leaders of the world launched malaria free campaign from 2008 – 2015. Global Malaria Action Plan (GMAP) became popular for the treatment of this endemic and effective roadmaps were drawn for the eradication of this disease. Pakistan developed tertiary healthcare microscopy centers and became an active member of GMAP in 2001 [2]. Another reason in the rural areas for the vector transmission is flawed planning of the irrigation system and the growth of agriculture also encourages the growth of mosquitos where municipal corporation is less active, mosquitos breed and grow in these areas.

Our research investigates the malaria magnitude for the species of Plasmodium that is affecting the target area of the research. Hence, in the setting of urban and rural societies such as Khairpur District the major issue is the healthcare at tertiary level in concern to the malaria spread. As we know no research work has been completed focusing the issue under discussion in this area. Our research will gather information on the sound basis of evidence which will help in the regulatory and policy making level and also assist in the ultimate achievement of the Malaria Roll Back goals for the reduction of ninety percent mortality rate. Malaria free Pakistan is the target till 2030. Our research also aims at the frequency determination of smear positive malaria in the patients visiting tertiary healthcare facility of the Khairpur District.

MATERIAL AND METHODS:

We conducted a cross sectional research starting from June-September, 2016 in the Microscopy centers of Civil Hospital Khairpur through consecutive sampling method. On daily basis thirty patients were treated in the hospital, patients were prescribed MP test and they were also referred to the specialist's doctors, ethical committee permission and participants consent was secured before the commencement of the research and also explained the process and objective of the research to the participants. Sample size was 138 calculated through WHO sample size calculator including the malaria prevalence as ten percent, ninety-five percent confidence, error margin as five percent. Patients having chronic illness such as HIV, Tuberculosis or related immune disease were not made a part of the research. We used a pre-designed questionnaire secured from the Demographic Survey held in 2013 in Pakistan [11]. All the patients diagnosed positive Parasite test with staining of Geimsa followed by test of thin peripheral film were categorized as Plasmodium species. SPSS-21 was used for data entry and analysis, quantitative data such as mean and SD were also calculated and data was presented categorically in percentage and frequency.

RESULTS:

In the total sample of the research male to female ratio was respectively 55.5% males and females were 44.5 % having mean age as (26.78 ± 16.26) years. Number of patients were below forty years and remaining (29.7%) in the range of 26 – 40 years. Less

than fifteen years population were 27% and they were accompanied by guardian or parents. Literate ratio was 54.3% and fifty percent were residing near District Khairpur. In the ninety-nine patients the age factor above fifteen years patients 72 were married (27.2%). An earning of ten thousand rupees were observed in fifty-one percent patients and above twenty-thousand income was reported by the 18 patients. In terms of drinking water, the source of water was bore water and un-boiled water respectively in 80% and 97% of the total participants and shown in Table-I.

In the total population of the research, smear positive and negative was observed respectively in 9 patients (6.5%) and 93% patients as shown in Table-II. In the positive cases 7 were Plasmodium Vivax (77.7%) and 2 Plasmodium Falciparum (22.2%). There was no identification of the other related species such as Plasmodium (Ovalle or Malerie) through any test or examination of peripheral blood film as shown in Table-III.

DISCUSSION:

Most common incidence in our research was observed for Plasmodium Vivax which immensely affected the patients. Numerous research studies also report that in the age of five year the common element of malaria is present which is also found in our research and a Kenyan research also observed the same findings as malaria incidence was observed in 49% of the children in the age group of five years [12]. A Tanzanian research found the complex association of malaria intensity, exposure, clinical features, age, malaria fatality and immunity in the children of five years age [13]. Due to the protective scarcity children were under threat of the anopheles mosquito specially when playing in the open. Any country has a direct relation of literacy and malaria interdependence. In the developed nations the malaria is less reported in comparison to the less educated countries [14]. The factors influential behind this fact are the awareness, education and preventive practice against malaria.

Literacy rate was around fifty percent in our research, in order to take required results educating people is mandatory about the malaria and its related preventive measures. A Nepalian research also supports the argument of literacy in the control of disease, as awareness molds the behavior of the population [15], same has been reported in the Indonesian research [16]; as it observed comprehension gap between literate and illiterate participants about malaria and healthcare practice and seeking process. In the perspective of a Kenyan study the incidence of malaria was high in the less privileged, poor and illiterate population. Furthermore, the greater amount of risk is posed to the children and women specially in the pregnant ladies over the world [18]. The burden of disease is fatal for the neonate and mothers [4].

Table 1: Sociodemographic characteristics of the study Participants N=138

Characteristics (N=138)		Frequency	Percentage
Age in years	< 5 years	15	10.9
	5 - 15 years	24	17.4
	16 - 25 years	30	21.7
	26 - 40 years	41	29.7
	> 40 years	28	20.3
Gender	Male	77	55.7
	Female	61	44.3
Marital status of adult population (n=99)	Single	27	22.72
	Married	72	72.28
Educational status	Illiterate	75	54.3
	Primary	33	23.9
	Intermediate	17	12.3
	Graduation/post-graduation	13	9.5
Total household income in Rupees	< 10,000	71	51.4
	10,000 - 20,000	49	35.5
	21,000 - 35,000	18	13.1
Area of residence	Khairpur city	61	44.2
	Luqman	7	5.1
	Rural area	61	44.2
	Outside Khairpur	9	6.5
Source of drinking water	Bore	113	81.9
	Water supply	22	16.1
	Unsafe open water	3	1.5
Type of water	Boiled	3	2.2
	Un-boiled	135	97.8

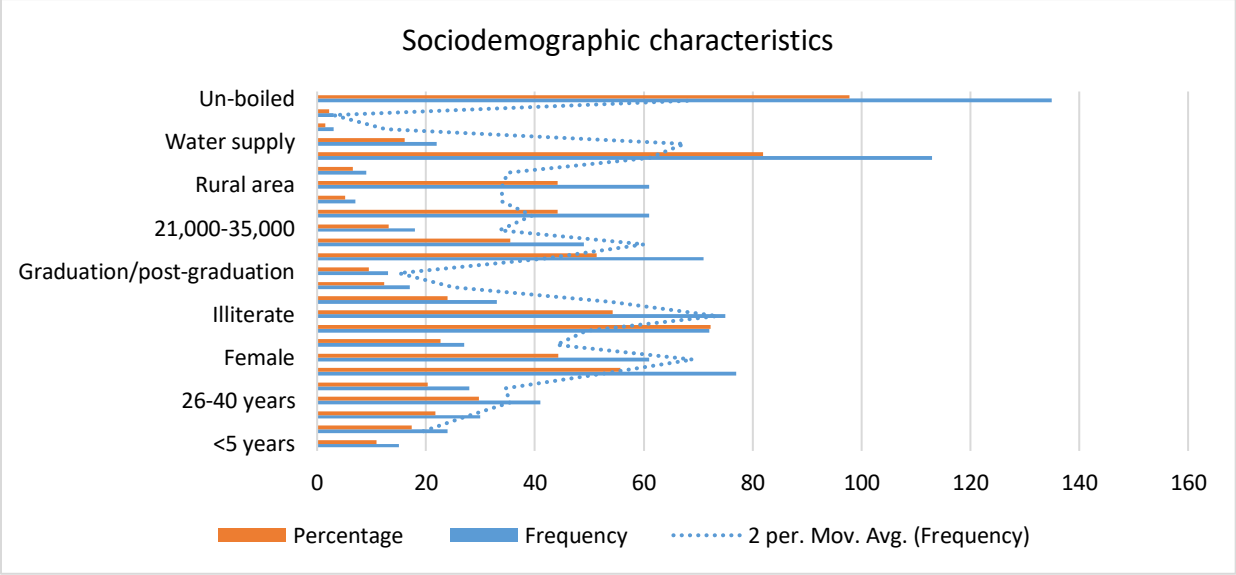


Table 2. Frequency of Smear Positive Malaria among study participants N=138

Malaria test Result (N=138)	Frequency	Percentage
Smear Positive	9	6.5
Smear Negative	129	93.5

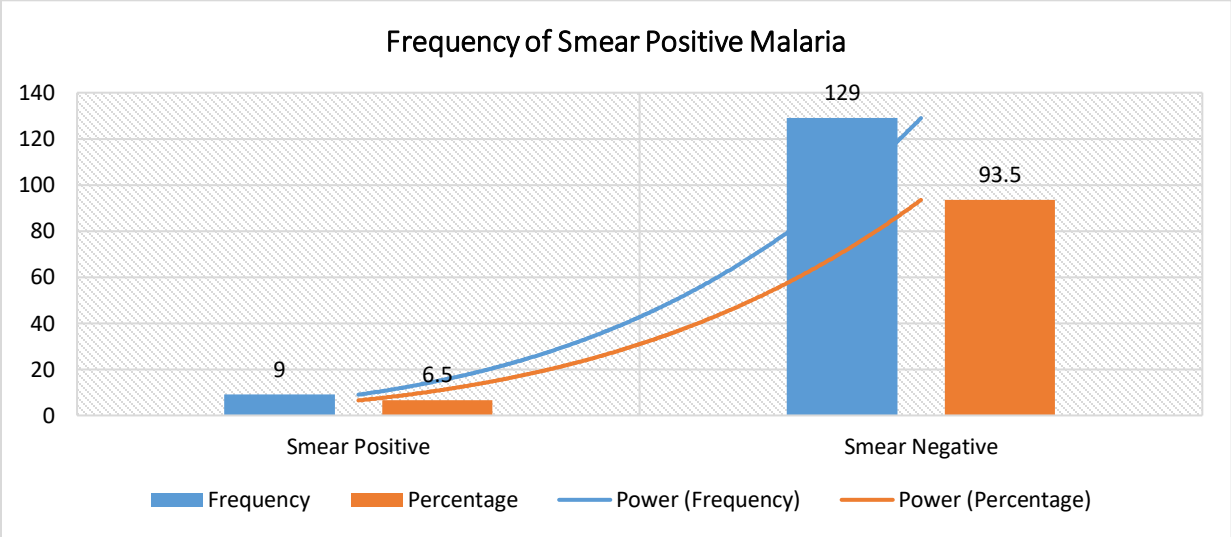
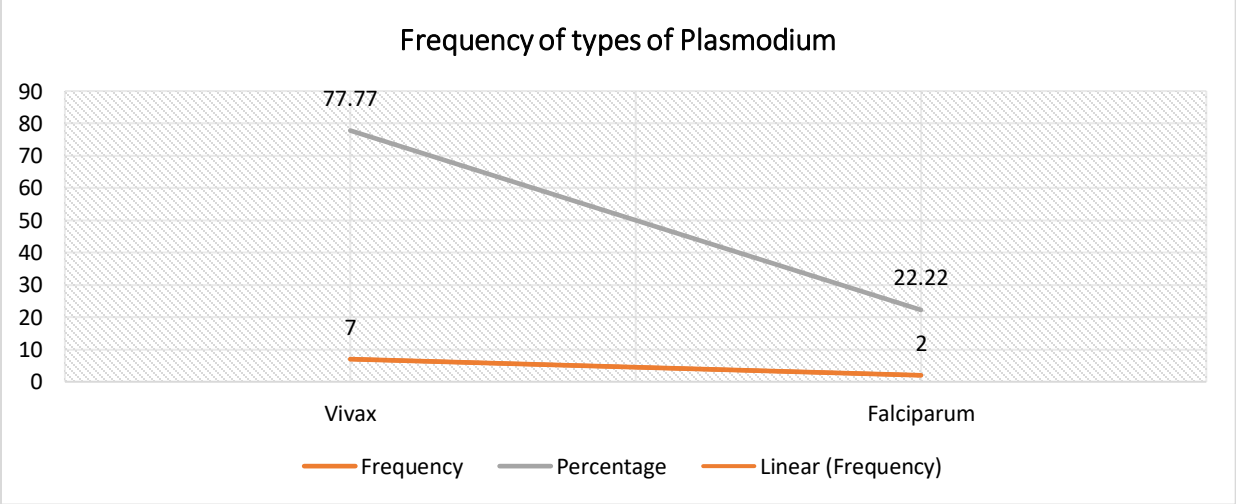


Table 3. Frequency of types of Plasmodium specie among smear positive Patients (n=9)

Type of Plasmodium Specie (N=9)	Frequency	Percentage
Vivax	7	77.77
Falciparum	2	22.22



There is a common believe about the malaria that it has a direct relation with the poverty [19], which links it with the social and economic condition of the patient. These features include an access to medical facility, drug quality and diagnosis facility [20]. Our research found that majority were in the shade of low economic status as shown in Table-I, in terms of their monthly income. The residential environment also depends upon the financial condition of the community and it affects the overall health and lifestyle. Malaria affected the less privileged and outskirts of any city or residential area. However, a research held in Sudan blames less the socio-economic inequalities in spread of malaria. Our research found common species as Plasmodium Vivax among the two-identified species including Falciparum and Plasmodium Vivax, which is also observed in a research held in the interior Sindh and Hyderabad [22 – 23]. On the other hand, Falciparum is reported common in the research studies held in the EMRO region, Tanzania and Africa [24 – 27].

In the limitations of the research its design was a limitation as it was unable to build any temporary association and research was single centered and limited to the tertiary level of healthcare. The generalization of the research cannot be made for the overall population of the District Khairpur. We recommend that the adoption of Roll Back Malaria is to be activated at every healthcare center and more research studies should be carried out to study the eradication of Malaria.

CONCLUSION:

We conclude that Malaria is an endemic in the specified areas of District, Khairpur and Plasmodium Vivax is considered as the common most species which affects the participants who visited hospital's Microscopy Centre for the verification of MP test. There is a dire requirement of awareness about the health issues and participation of the society for the eradication of the Malaria from the communities of Khairpur.

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