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SOCIO-ECONOMIC DETERMINANTS FOR MALARIA TRANSMISSION IN RURAL AREA OF CHHATTISGARH

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ABSTRACT

Malaria is a major global public health issue, with India responsible for 61% of malaria cases and 41% of malaria-related deaths in Southeast Asia. The country's population is in regions with a high malaria risk, with northeast, central, and eastern regions having the highest malaria load. The prevalence of malaria is attributed to socio-economic conditions, limited information, and perceptions of the disease. Factors such as ethnic groupings, parental education, personal preventative measures, and family living conditions also contribute to the risk of malaria transmission. A study was conducted to identify risk factors contributing to malaria susceptibility in villages in RHTC Seepat, CIMS, Bilaspur. The study found that a total of 2856 individuals were included in the study.

The study surveyed 510 participants, mainly male, aged 31-50, Hindu, and belonging to nuclear families. They had varying socio-economic and environmental profiles, with most living in kachacha houses and having pets. The participants were also aware of malaria, its transmission, and perceptions on malaria prevention. The study found that most participants were unaware of malaria transmission and did not take preventive measures.

The study found that all participants were aware of malaria, with 83.7% knowing symptoms and transmission. However, 82.9% were not aware of ITN. No significant association was found between cast and family nature, but a significant association was found between household take preventive measures and malaria occurrence.

A study found a significant association between factors such as ventilation, mosquito breeding place, sleeping habits, and pet animal co-residing in house premises and malaria occurrence. The majority of participants were male and from socioeconomically disadvantaged backgrounds. Factors such as caste, sleeping habits, mosquito breeding sites, inadequate drainage, inappropriate waste disposal, and insufficient lighting in residential buildings were

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found to contribute to malaria prevalence. Community-based interventions can effectively prevent malaria transmission.

Keywords - malaria, frequency, cluster, prevalence, association, aware.

INTRODUCTION

Malaria is a significant global public health issue and stands as a prominent contributor to both illness and death rates in developing nations [1]. India is responsible for 61% of malaria cases and 41% of malaria-related deaths in nations within the Southeast Asia Region (SEAR) [2]. The prevalence of malaria within the nation is sufficiently extensive, with approximately 95% of the country's populace residing in regions where the danger of contracting malaria is present. The regions of northeast, central, and eastern India are responsible for the highest malaria load within the country [3]. In India, six states, namely Odessa, Jharkhand, Chhattisgarh, Madhya Pradesh (MP), West Bengal, and the states in North East, account for two-thirds of all reported malaria cases [4]. Chhattisgarh is a state with a high prevalence of malaria, accounting for 12% of malaria cases in the country. Additionally, it has the greatest proportion of malaria-related deaths, amounting to 17% of the total fatalities in the nation [5]. Tribal settlements exhibit the highest prevalence of malaria within the state. Additionally, the region exhibits economic underdevelopment, characterized by a challenging topography, limited communication infrastructure, and insufficient healthcare facilities [6].

The prevalence of malaria in the region can be attributed to a combination of factors, including unfavourable socio-economic conditions, limited information, and perceptions regarding malaria, as well as the effectiveness of anti-malarial measures. Several socio-demographic characteristics, including ethnic groupings, parental education levels and occupations, utilization of personal preventative measures, and family living conditions, play a significant role in the risk of malaria transmission and epidemics. The understanding of malaria and the promotion of socio-economic development are crucial elements in the implementation of suitable intervention measures. The primary approaches employed in India to combat malaria include personal protective measures, such as the use of insecticide-treated bed nets (ITNs), as well as the administration of efficient anti-malarial treatments. These tactics are outlined on the official website of the National Vector Borne Disease Control Programme (NVBDCP) in India (http://www.nvbdcp.gov.in/).

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The present study was designed to identify the risk factors that contribute to the susceptibility to malaria in villages under RHTC Seepat, CIMS, Bilaspur (C.G.). These risk factors encompass a range of variables, such as the level of knowledge regarding malaria transmission and prevention, the demographic characteristics of different population groups, and the socio-economic status of the individuals.

OBJECTIVES

1. To find out magnitude of fever and malaria cases in study area.

2. To study socio-economic determinants of malaria transmission in the study area.

3. To find out association between socio-economic factors and transmission of malaria in the study area.

MATERIAL & METHODS:

The present study was a descriptive cross-sectional study that was carried out at the field practice area of RHTC Seepat, CIMS, Bilaspur (C.G.). The researchers employed a multistage sampling strategy. The initial phase of the study employed a Probability Proportional to Size (PPS) sampling method, utilizing the 2011 population census as the sampling frame. The total population of the Rural Health Training Centre (RHTC) in Seepat is 41,133 individuals. The cluster interval was calculated by dividing 41,133 by 30, resulting in a value of 1371.A total of 30 clusters were selected using a cluster spacing of 30. The clusters were present in a total of 16 communities.

In the second step, a total of 17 households were picked at random within each cluster. Therefore, a total of 510 households were chosen for the study, distributed over 30 clusters located in 16 different villages. Out of the 510 households, a total population of 2856 individuals were encompassed. A pre-designed and pre-tested questionnaire was produced, and the direct personal interview method was employed.

INCLUSION CRITERIA:

Head of the family or if HOF not available than any family member more than 18-year age.

Head of the family who are willing and give their consent to participate in the study.

EXCLUSION CRITERIA:

Member below 18year of age group.

FIGURE NO. 1- Fever with chills cases at households' level of in the last one year.

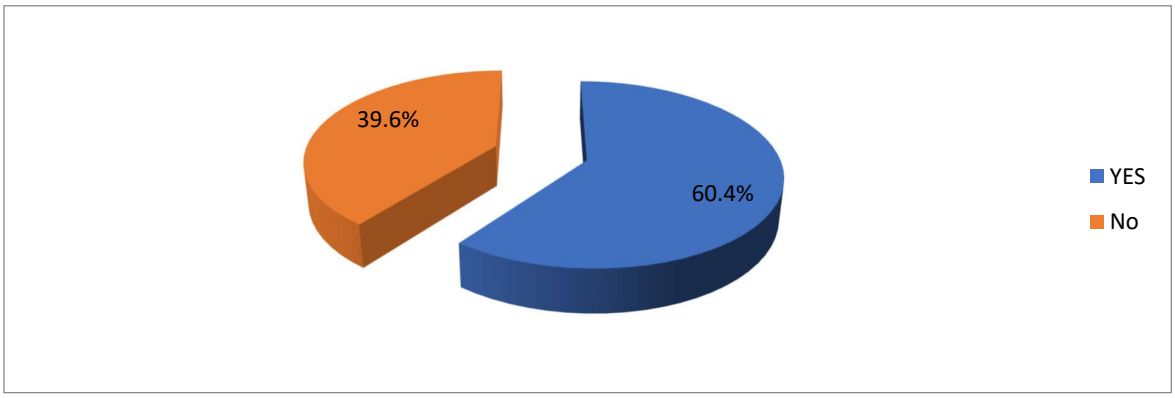
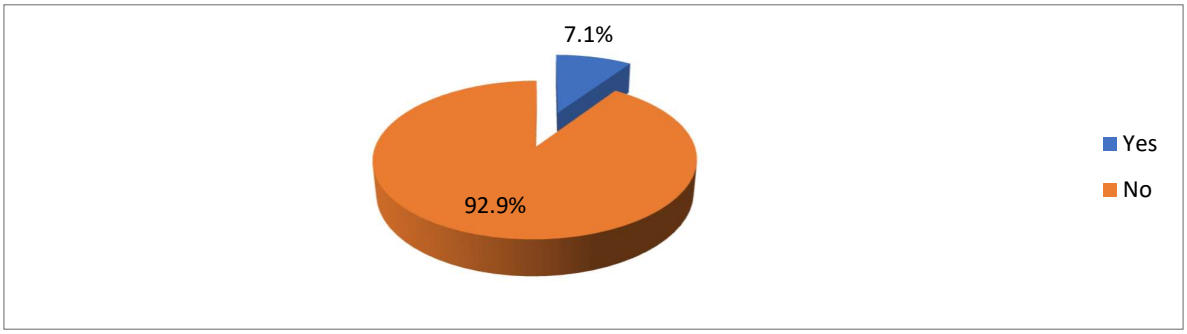


FIGURE NO. 2- : History of Malaria in last one year at household level.



OBSERVATIONS AND RESULTS

TABLE No.1 SOCIO-DEMOGRAPHIC PROFILE OF STUDY PARTCIPANT

AGE(YR)	Frequency	Percentage (%)
18-30	148	29.0
31-40	140	27.5
41-50	128	25.1
51-60	55	10.8
More than 60	39	7.6

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Total	510	100
SEX	**Frequency**	**Percentage (%)**
Male	345	67.6
Female	165	32.4
Total	510	100
RELIGION	**Frequency**	**Percentage (%)**
Hindu	502	98.4
Muslims	7	1.4
other	1	0.2
Total	510	100
NATURE OF FAMILY	**Frequency**	**Percentage (%)**
Nuclear	312	61.2
Joint	198	38.8
Total	510	100
TOTAL FAMILY MEMBER	**Frequency**	**Percentage (%)**
1-4	149	29.2
5-9	334	65.5
10 and above	27	5.3
Total	510	100

Table-1 shows 67.6% of our study participants were male and half of participants (52.6%) were 31-50 year. Most of the study participants were Hindu (98.4%). More than half of the household having 5-9 family member and (61.2%) belong to nuclear family.

TABLE NO.2 SOCIO-ECONOMIC AND ENVIRONMENTAL PROFILE OF STUDY PARTICIPANT

EDUCATION	Frequency	Percentage (%)
Illiterate	126	24.7
Primary school	96	18.8
Middle School	104	20.4
High school	86	16.9
Higher Sec. and above	98	19.2
Total	510	100
OCCUPATION	**Frequency**	**Percentage (%)**
No work	137	26.9
Cultivation	169	33.1
Labour	103	20.2
Business/Shopkeeper	61	12.0
Service	40	7.8
Total	510	100
SES	**Frequency**	**Percentage (%)**
Upper High	6	1.2
High	13	2.6
Upper middle	67	13.1
Lower middle	202	39.6
Poor	220	43.1
Total	510	100
TYPE OF HOUSE	**Frequency**	**Percentage (%)**
Kachacha	214	42.0
Semipacca	174	34.1
Pacca	122	23.9
Total	510	100
MOSQUITO BREEDING PLACE	**Frequency**	**Percentage (%)**
Yes	381	74.7
No	129	25.3
Total	510	100

PET ANIMAL CO-RESIDE IN HOUSE PREMISES	Frequency	Percentage (%)
Yes	244	47.8
No	266	52.2
Total	510	100

Table-2 shows that half of the participants were farmer belong to poor (43.1%) and lower middle-class family (39.6%). Most of the study population living in kachacha houses (42.0%), two third household having mosquito breeding place. In 47.8% household having pet animal co-reside in the house premises.

TABLE NO 3. MALARIA EPIDEMIOLOGY RELATED CHARACTERISTICS OF STUDY PARTICIPANT

KNOW/AWARE ABOUT MALARIA	Frequency	Percentage (%)
YES	485	95.1
NO	25	4.9
TOTAL	510	100
AWARE OF SYMPTOMS OF MALARIA	**Frequency**	**Percentage (%)**
YES	427	83.7
NO	83	16.3
TOTAL	510	100
KNOW HOW MALARIA TRANSMITTED	**Frequency**	**Percentage (%)**
YES	435	85.3
NO	75	14.7
TOTAL	510	100
PERCEPTION ON MALARIA PREVENTION	**Frequency**	**Percentage (%)**
CAN BE PREVENTED	305	59.8
CAN NOT BE PREVENTED	31	6.1

CAN NOT SAY	174	34.1
TOTAL	510	100
TAKE ANY PREVENTIVE MEASURES	**Frequency**	**Percentage (%)**
YES	394	77.3
NO	116	22.7
TOTAL	510	100
AWARE ABOUT ITN	**Frequency**	**Percentage (%)**
YES	87	17.1
NO	423	82.9
TOTAL	510	100
IEC ACTIVITIES	**Frequency**	**Percentage (%)**
YES	42	8.2
NO	204	40.0
CAN NOT SAY	264	51.8
TOTAL	510	100

Table-3 shows that all the participants were aware about malaria, (83.7.%) were know about symptoms of malaria, (85.3%) know how malaria transmitted. (82.9%) participant was not aware about ITN.

TABLE 4. ASSOCIATION BETWEEN SOCIO-ECONOMIC PROFILE OF STUDY PARTICIPANTS IN RELATION TO MALARIA (N=230)

SOCIO-ECONOMIC PROFILE OF STUDY PARTICIPANT	**MALARIA**			**Chi-square value (X^2)**	**P-value**	**Significance Level**
CAST	**YES**	**NO**	**TOTAL**			

GENERAL	1(4.35%)	22(95.65%)	23(100.00%)	10.549	0.014	P<0.05
OBC	16(12.50%)	112(87.50%)	128(100.00%)			
SC	9(16.98%)	44(83.02%)	53(100.00)			
ST	9(34.62%)	17(65.38%)	26(100.00%)			
TOTAL	35(15.22%)	195(84.78%)	230(100.00%)			
NATURE OF FAMILY	**YES**	**NO**	**TOTAL**			
NUCLEAR	25(14.37%)	149(85.63%)	174(100.00%)	0.607	0.738	p>0.05
JOINT	9(18.75%)	39(81.25%)	48(100.00%)			
THREE GENERATION	1(12.50%)	7(87.50%)	8(100.00%)			
TOTAL	35(15.22%)	195(84.78%)	230(100.00%)			
TAKE PREVENTIVE MEASURE	**YES**	**NO**	**TOTAL**			
YES	34(18.38%)	151(81.62%)	185(100.00%)	6.1242	0.001	P<0.05
NO	1(2.22%)	44(97.78%)	45(100.00%)			
TOTAL	35(15.22%)	195(84.78%)	230(100.00%)			

This table-4 shows that no significant association was found between cast and nature of family with occurrence of malaria. Significant ($p<0.05$) association was found between household take any preventive measures to avoid mosquito bite at night and occurrence of malaria.

TABLE 5. ASSOCIATION BETWEEN HOUSING CHARACTERISTIC OF STUDY PARTICIPANT IN RELATION TO MALARIA (N=510)

HOUSING CHARECTERSTIC	MALARIA			Chi-square value (X^2)	p-value	Significance Level
TYPE OF HOUSE	**YES**	**NO**	**TOTAL**			
Kaccha	23(23.96 %)	73(76.04 %)	96(100.00 %)	11.180	0.0036	p>0.05
Semi pacca	10(11.76 %)	75(88.24 %)	85(100.00 %)			
Pacca	2(4.08%)	47(95.92 %)	49(100.00)			
TOTAL	35(15.22 %)	195(84.78 %)	230(100.00 %)			
VENTILATION	**YES**	**NO**	**TOTAL**			
Adequate	4(6.35%)	59(93.65 %)	63(100.00 %)	4.384	0.0082	P>0.05
Inadequate	31(18.56 %)	136(81.44 %)	167(100.00 %)			
Total	35(15.22 %)	195(84.78 %)	230(100.00 %)			
LIGHTING	**YES**	**NO**	**TOTAL**			
Adequate	5(7.81%)	59(92.19 %)	64(100.00 %)			P<0.05

Inadequate	30(18.07 %)	136(81.93 %)	166(100.00 %)	3.0154	0.0241	
Total	35(15.22 %)	195(84.78 %)	230(100.00 %)			
MOSQUITO BREEDING PLACE	**YES**	**NO**	**TOTAL**			
YES	34(19.54 %)	141(80.46 %)	175(100.00 %)	8.740	0.0002	P<0.05
NO	1(1.82%)	54(98.18 %)	55(100.00 %)			
Total	35(15.28 %)	194(84.72 %)	230(100.00 %)			
SLEEPING HABIT	**YES**	**NO**	**TOTAL**			
OUTSIDE	18(27.27 %)	48(72.73 %)	66(100.00 %)	9.1573	0.001	P<0.05
INSIDE	17(10.37 %)	147(89.63 %)	164(100.00 %)			
TOTAL	35(15.22 %)	195(84.78 %)	230(100.00 %)			
PET ANIMAL CO- RESIDE IN HOUSE PREMISES	**YES**	**NO**	**TOTAL**			
YES	29(19.08 %)	123(80.92 %)	152(100.00 %)	4.3353	0.010	P<0.05
NO	6(7.69%)	72(92.31 %)	78(100.00 %)			
Total	35(15.22 %)	195(84.78 %)	230(100.00 %)			

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This table-5 Significant association($p<0.05$) was found between ventilation, mosquito breeding place of houses, sleeping habit, pet animal co-resides in house premises and malaria occurrence. No significant association was found with type of house.

RESULTS

Of the 510 household heads who participated in the interview, 67.60% (345 out of 510) were identified as male. Approximately 60.4% (309 out of 510) of the participants reported a previous occurrence of fever, whereas 7.1% (36 out of 510) had a history of malaria within the past year. The majority of our study participants are individuals engaged in agricultural activities and are affiliated with socioeconomically disadvantaged backgrounds, with 43.1% classified as poor and 39.6% falling under the lower middle-class category. The research area exhibited a statistically significant association ($p<0.05$) between the occurrence of malaria and many factors, including caste, sleeping habits, mosquito breeding sites such as water collection areas, pits, inadequate drainage, inappropriate waste disposal, and insufficient lighting in residential buildings.

Moreover, it is worth noting that households employ preventive measures such as the use of mosquito nets to mitigate the risk of mosquito bites during the night. This practice has been found to have a significant association ($p<0.05$) with the prevalence of malaria.

CONCLUSIONS AND RECOMMENDATIONS

The present study demonstrates that community-based interventions aimed at enhancing the standard of living and promoting health awareness regarding malaria can effectively contribute to the prevention of malaria in the study region, hence reducing the risk of malaria transmission.

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