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Knowledge on Malaria among tribal population in East Godavari District, Andhra Pradesh

K.Sowmyasudha[1], K.V.Adinatesh[2], G.Sravana Kumar[3], Penupothu Sree Nagamani[4], G.Krishnababu[5]*

ABSTRACT

Introduction

Malaria is one of the world's important parasitic diseases. Malaria deaths reached 445 000 in 2016, a similar number (446 000) to 2015. During 2017 India contributes to 633481 malaria cases and 103 deaths due to malaria. In Andhrapradesh among five Endemic Districts East Godavari is one. We made an attempt to report tribal awareness towards malaria in this district.

Aim

To assess the Knowledge on Malaria among tribal population

Objectives

1. To assess the knowledge of the tribal people towards malaria disease.
2. To compare the knowledge of tribal people in different P.H.C area.

Materials & Methods

Using a systematic random method a total of 1136 participants were interviewed from four tribal P.H.C areas of East Godavari District. Semi-structured questionnaires which consist questions regarding knowledge on malaria were used as a tool to interview them. Data were entered into excel sheets and analysed by using SPSS 17.

Results

In this study all of the respondents heard about the disease Called malaria. In total 39.8% mentioned ghost while strolling in the forest, 28.83% mentioned evil eye and 32.51% mentioned black magic voodoo as the causes for malaria. Majority opined it as a communicable disease.98.59% of the study respondents believe that a smear for malaria is required for diagnosis.55.01% of the study respondents took treatment from both traditional healer and MPW-M.36% of the study populations have given multiple answers for the source of mosquito breeding places.62.84% of the study participants sleep inside mosquito net both inside and outside of the house.100% of the respondent had mosquito bites during work in the fields. None of them were using any of the personal protective measures during their work in the forest. 96.7%said they cover themselves with blanket during sleep in the forest.95% of the study respondents seem to have rain water collections.36.44% of the study respondents have identified fire and smoke to prevent man-mosquito contact. None of their houses had screen for doors and windows.61.61% of the study respondents have said they have no knowledge on personal protection methods.

Conclusion

To come to a conclusion our tribal participants have average knowledge on cause diagnosis & treatment of malaria, poor knowledge in personal protective measures and average knowledge in the aspects of disease prevention.

Keywords: Malaria, Mosquitoes, Knowledge, DDT, IRS, LLINs, ITNs

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INTRODUCTION

Malaria is a life-threatening disease caused by parasites that are transmitted to people through the bites of infected female Anopheles mosquitoes. In 2016, there were an estimated 216 million cases of malaria in 91 countries, an increase of 5 million cases over 2015. Malaria deaths reached 445 000 in 2016, a similar number (446 000) to 2015.The WHO African Region carries a disproportionately high share of the global malaria burden. In 2016, the region was home to 90% of malaria cases and 91% of malaria deaths. Most malaria cases and deaths occur in sub-Saharan Africa. However, the WHO regions of South-East Asia, Eastern Mediterranean, Western Pacific, and the Americas are also at risk. In 2016, 91 countries and areas had ongoing malaria transmission. The WHO African Region continues to carry a disproportionately high share of the global malaria burden. Some 15 countries – all in sub-Saharan Africa, except India – accounted for 80% of the global malaria burden[1]. During 2017 India contributes to 6,33,481 malaria cases and 103 deaths due to malaria[2].Tribal population in India is mostly residing in areas which are remote and difficult to reach due to typical geographical situations usually due to forest, hills, valleys and perennial streams[3,4]. The presence of various malaria parasites and vector species, climatic diversity favouring growth and proliferation of the parasite and vector as well as a highly susceptible human population have resulted in high malaria transmission in tribal areas[3,5].In Andhrapradesh, East Godavari district was included under World Bank assisted National Vector Borne disease support project. Majority of the tribal population was also residing in East Godavari District contributing malaria cases. About 2.5 lakh people are living in malaria endemic areas of East Godavari District. It contributes to 2414 cases during 2010. Malaria is highly endemic in tribal population with an API > 5. Vectors flourish amidst the greatest poverty, poor services and low health status. Little is known about community beliefs and behaviors particularly in tribal people. So, there is a need to know the existing knowledge regarding malaria. Hence the present study was undertaken as an attempt to know their knowledge in the tribal areas of East Godavari District.

Aim

To assess the Knowledge on Malaria among tribal population.

Objectives-

1. To assess the knowledge of the tribal people towards malaria disease.
2. To compare the knowledge of tribal people in different P.H.C area.

Methodology

A cross sectional study was done in Tribal areas of East Godavari District for a period of one year during 2013 Sample size was calculated as 1136 by using the following formula $n= 4pq/d^2$ (P=28%, Sharma et al[6]) By using a Multistage random sampling method Four P.H.Cs were selected in four directions of tribal areas and the sample was distributed equally in all the PHCs then four sub centres & four villages were selected. In the study villages study subjects were identified by using a simple random method. After obtaining institutional ethical committee clearance and consent from the participants Data was collected by using a pre-tested, semi-structured questionnaire consisting of both open ended and closed ended questions covering knowledge in the aspects of causation, identification, mode of transmission, mosquito breeding habits, prevention and control. All the data were entered into excel sheet and analysed by using SPSS software.

Results

knowledge on malaria causation-

in this study all of the respondents know (heard) about the disease Called malaria. 81.33% of the respondents in Duppulapalem P.H.C believed that the cause of malaria is mosquito bites as compared to 35.21% in Zaddangi P.H.C. 27.46% of the respondents in Zaddangi P.H.C believe it is due to storage of drinking water as compared to 4.22% in Duppulapalem.28.52% of the respondents in Zaddangi believe that it is of superstition as compared 5.99% in Narasapuram P.H.C. Chi square=263.73, d.f=18, p<0.001 **(table-1).**

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Table-1: P.H.C wise distribution of study respondent's knowledge on malaria causation

Malaria causation	P.H.C's				Total
	Narasapuram	Zaddangi	Duppulapalem	Devipatnam	
Mosquito bite	227 (79.92%)	100 (35.21%)	231 (81.33%)	195 (68.66%)	753 (66.28%)
Stagnant water	8 (2.81%)	22 (7.74%)	0	14 (4.29%)	44 (3.87%)
Drinking Water	13 (4.57%)	78 (27.46%)	12 (4.22%)	37 (13.02%)	140 (12.32%)
Environment	7 (2.46%)	3 (1.05%)	0	2 (0.7%)	12 (1.05%)
Superstition	17 (5.98%)	81 (28.52%)	30 (10.56%)	35 (12.32%)	163 (14.34%)
Any combination of above two	12 (4.22%)	0	11 (3.87%)	1 (0.35%)	24 (2.11%)
Total	284 (25%)	284 (25%)	284 (25%)	284 (25%)	1136 (100%)

Suggesting that there is a big gap in the knowledge levels of the study respondents in relation to cause of malaria which needs to be addressed. Does this gap reflect in the API in Zaddangi as compared to other P.H.C's? In total 39.8% mentioned ghost while strolling in the forest, 28.83% mentioned evil eye and 32.51% mentioned black magic voodoo as the causes for malaria **(fig-1).**

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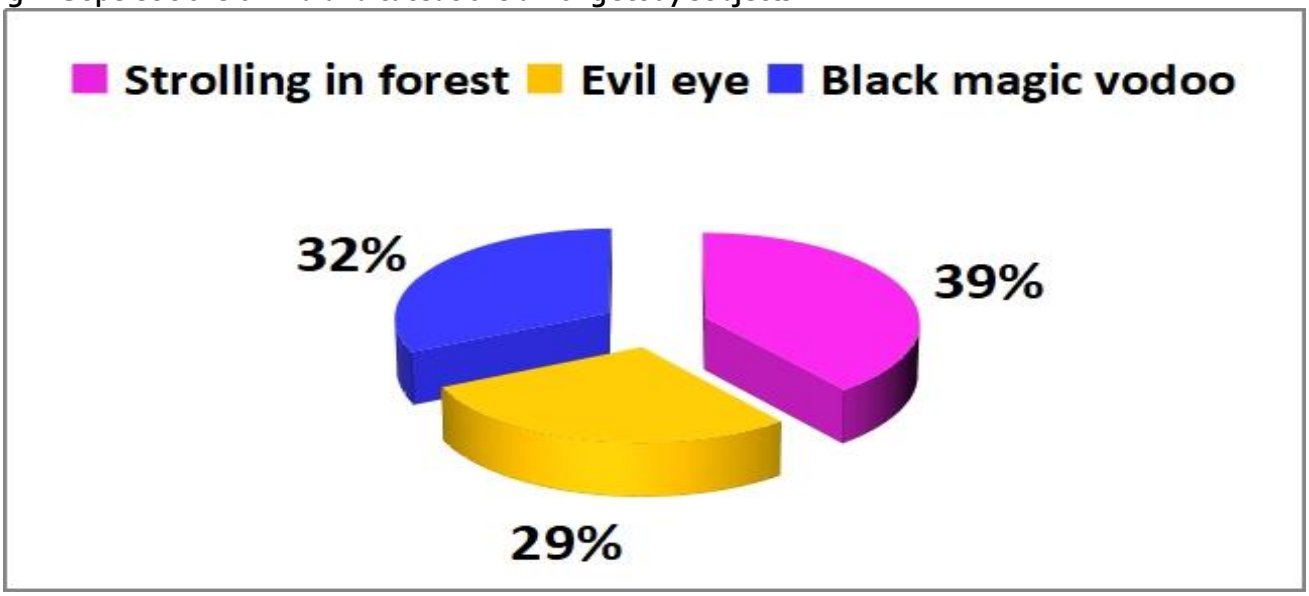
Fig-1: Superstitions on malaria causations among study subjects



80.54% of the study respondents said anyone can get malaria as compared to 19.54% who said with mosquito bite as correct answer.100% of the study subjects in all the 4 P.H.C's believed that pre-school children, school children and pregnant women were at risk of acquiring malaria.96.9% of the study respondents believed that malaria was contagious. 7.74% of the study participants in Zaddangi P.H.C did not believe that it was contagious.

Knowledge on Transmission-

Majority 97.93% of males and 96.16% of females opined it as a communicable disease. Zaddangi P.H.C. believed that malaria was contagious by using same utensils in 30.53%. Followed by mosquito bite 27.86%, through drinking water 19.84%.by air, air and water and through changes in environment-21.74%. Similar nature of contagiousness of malaria is seen in Narasapuram P.H.C 26.06%. Use of same utensils and spread through drinking water seen to be major modes of malaria transmission other than mosquito bite in the remaining 2 P.H.C's(other than Zaddangi and Narasapuram).100% of the study respondents give history of having had malaria in last one year before the study and similarly history of malarial attacks in their family were also present in the last one year prior to the study.

Knowledge on Diagnosis-

98.59% of the study respondents believe that a smear for malaria is required for diagnosis. 4.57% of study respondents in Zaddangi P.H.C and 1.05% from Devipatnam P.H.C believe that smear for malaria is not required.69.45% of the study respondents believed at health worker male was responsible for confirmation of malaria as compared to 30.45% who said that health worker female was responsible. In Zaddangi P.H.C 78.52% believed that health worker female was responsible for confirmation of malaria as compared to 21.47% who said that health worker male was responsible. In the remaining 3 P.H.C's majority of the study subjects said that was health worker male responsible for confirmation of malaria as it is a correct answer. (76.4% to 98.23%).

Knowledge on Treatment-

55.01% of the study respondents took treatment from both traditional healer and health worker male as compared to 38.9% from health worker female alone,3.6% from Traditional healer alone, 1.56% from health worker male alone and <1% from medical officer. Only 4.57% of the study respondents from Zaddangi P.H.C took treatment from TH and health worker male as compared to 95.4% taking treatment from health worker female alone which is quite surprising compared to their knowledge levels on causation and transmission. 83.45% of the study respondents in Duppulapalem and 74.7% of study respondents of Narasapuram take treatment from both health worker male and TH. As compared to 15.49% and 9.5% from health worker female. This again is surprising given their knowledge levels on malaria causation, transmission, diagnosis and treatment. Suggesting that having knowledge need

not necessarily reflect on practices. 86.97% of the study participants believed that the duration of treatment for malaria was 3-5 days as compared to 11.09% said that the duration was related to relief from symptoms and 1.49% who believed on the advice of traditional healer. 18.66% of the study respondents from Devipatnam P.H.C believed that the duration of treatment is linked to relief from symptoms as compared to 5.28% in Duppulapalem and 10.56% in Zaddangi. 4.22% of study population in Narasapuram P.H.C believed on the advice of TH as compared to 1.05% in Zaddangi P.H.C. Chi square=45.792, d.f=9, p<0.001 **(table-2).**

Table-2: P.H.C wise distribution of knowledge on the Duration of treatment for malaria

Duration of treatment for malaria	**P.H.C's**				**Total**
	Narasapuram	Zaddangi	Duppulapalem	Devipatnam	
Full course.(3-5 days)	244 (85.91%)	251 (88.38%)	260 (91.54%)	224 (78.87%)	988 (86.97%)
Till symptoms are relieved.	28 (9.85%)	30 (10.56%)	15 (5.28%)	53 (18.66%)	126 (11.09%)
As advised by the T.H	12 (4.22%)	3 (1.05%)	9 (3.16%)	7 (2.46%)	17 (1.49%)
Total	284 (25%)	284 (25%)	284 (25%)	284 (25%)	1136 (100%)

Knowledge on Mosquito breeding places-

36% of the study populations have given multiple answers for the source of mosquito breeding places as compared to 21.3% who said mosquito breeds in stagnant/drain water. Followed by 14.78% who said that mosquitoes breed among bushes and another 14.87% who said that they breed in forest and hilly areas. In Duppulapalem P.H.C only 15.14% have given multiple answers for mosquito breeding sources as compared to 60.91% in Zaddangi. 35.21% believe that mosquitoes breed only in stagnant/drain water in Duppulapalem P.H.C as compared to 14.78% in Zaddangi P.H.C. 21.47% in Duppulapalem P.H.C believe that forest as source of mosquito breeding as compared to 1.4% in Narasapuram. Chi square= 346.302,d.f=15, p<0.001 **(table-3).**

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Table-3: P.H.C wise distribution of study respondent's knowledge on mosquito breeding places

Mosquito breeding places	P.H.C's				Total
	Narasapuram	Zaddangi	Duppulapalem	Devipatnam	
Stagnant water/drainage	46 (16.19%)	42 (14.78%)	100 (35.21%)	54 (19.01%)	242 (21.3%)
Bushes	28 (9.85%)	33 (11.61%)	72 (25.35%)	35 (12.32%)	168 (14.78%)
Forest	4 (1.4%)	31 (10.91%)	61 (21.47%)	50 (17.6%)	146 (12.85%)
Hills	2 (0.7%)	0	0	0	2 (0.17%)
Forest and hill	97 (34.15%)	5 (1.76%0	8 (2.81%)	59 (20.77%)	169 (14.87%)
More than one answer	107 (37.67%)	173 (60.91%)	43 (15.14%)	86 (30.28%)	409 (36%)
Total	284 (25%)	284 (25%)	284 (25%)	284 (25%)	1136 (100%)

Knowledge on Mosquito biting time-

The biting time of mosquito in general is 5pm-10pm. They start biting by late evening and the peak of biting activity is at midnight and early hours in the morning.59.15% of the study respondents have said that mosquitoes bite during night as compared to 38.29% who said that they bite either at dawn or dusk. 2.5% said that mosquitoes bite only day time. 27.46% of study respondents from Zaddangi said that mosquitoes bite either at dawn or dusk. 55.98% of study respondents in Narasapuram P.H.C's, 40.49% of study respondents in Narasapuram P.H.C believe that the mosquitoes bite only during night as compared to 70.42% from Duppulapalem P.H.C. Chi square-76.202,d.f-6,p=0.001**(fig-2).**

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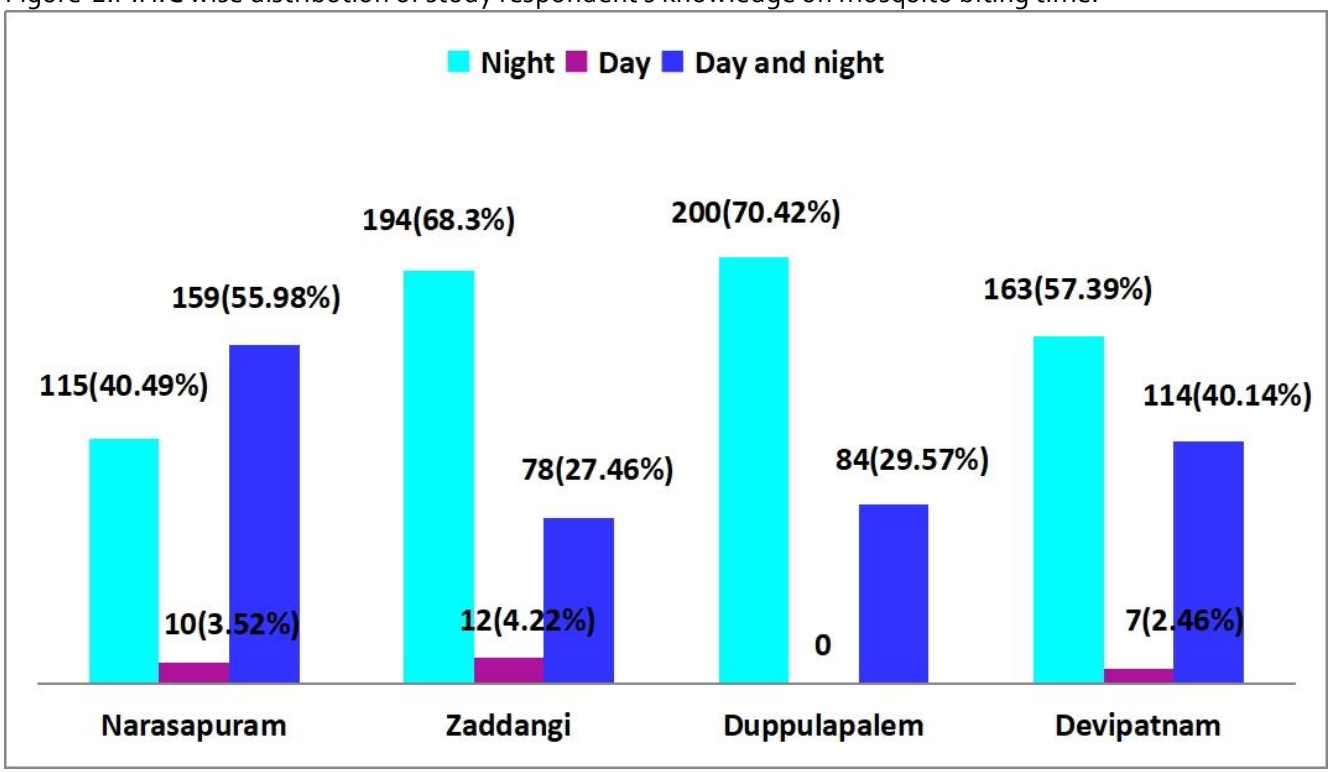
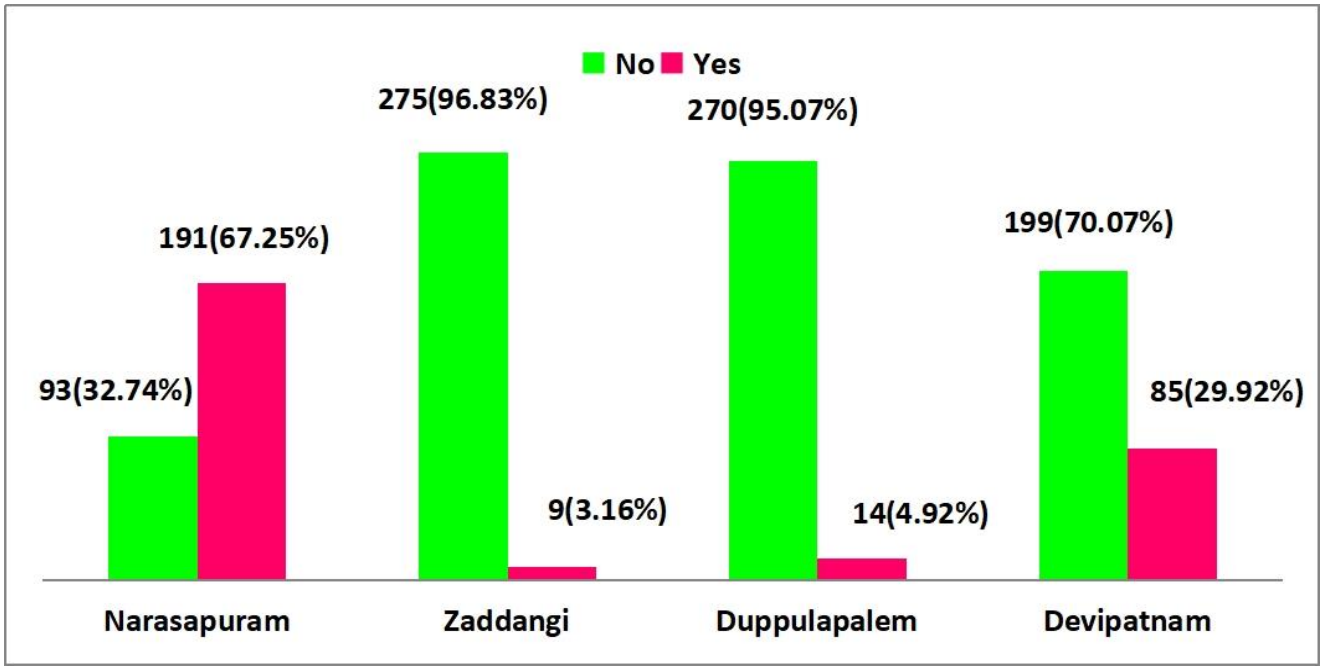
Figure-2:P.H.C wise distribution of study respondent's knowledge on mosquito biting time:



73.67% of the study respondents have said that all mosquitoes are not the same as compared to 26.32% said that they are the same.67.26% of the study respondents from Narasapuram P.H.C said that the mosquitoes are the same as compared to 3.16% of the study participants from Zaddangi. Chi square-392.784,d.f-3,p<0.001**(fig-3).**

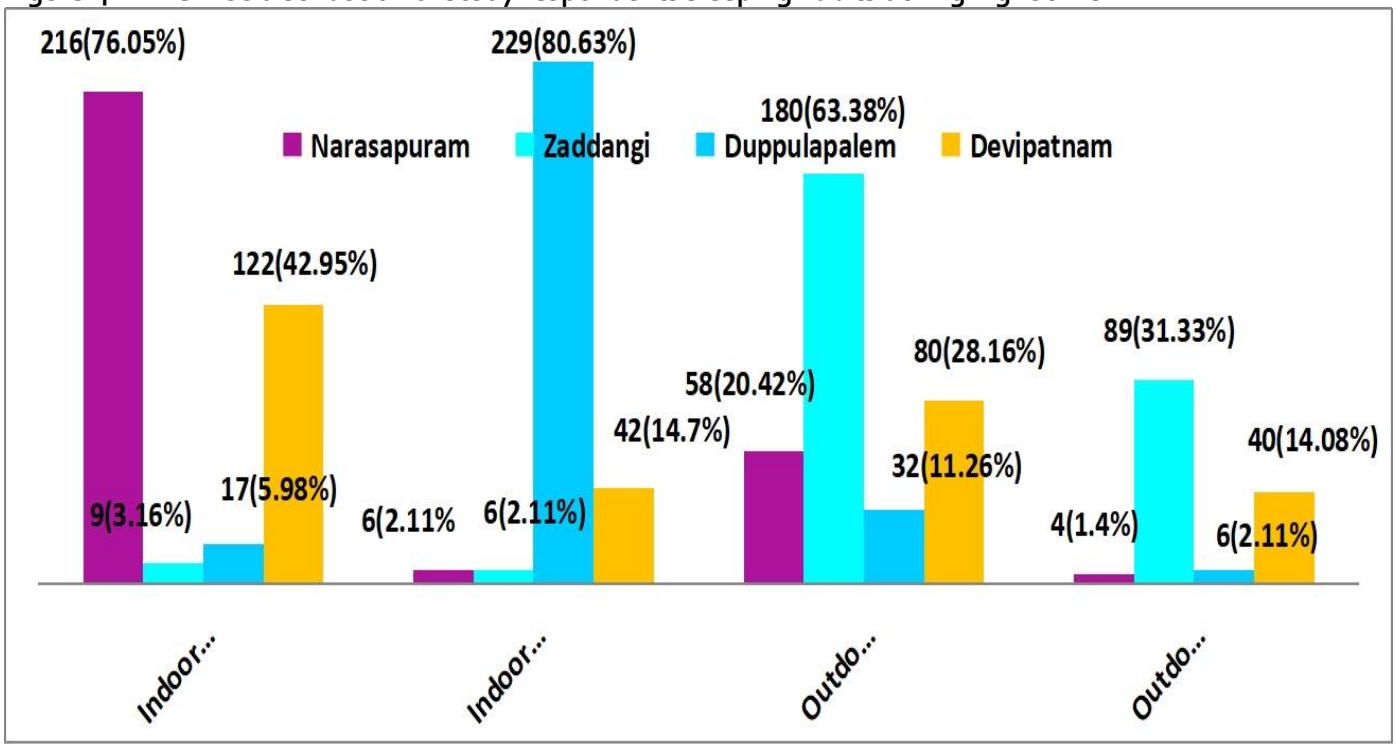
Figure-3:P.H.C wise distribution of study respondent's knowledge on species of mosquitoes



Knowledge on usage of personal protective measures-

62.84% of the study participants sleep inside mosquito net both inside and outside of the house as compared to 37.16% who sleep inside the net. 76.05% of the study respondents in Narasapuram P.H.C sleep inside mosquito net as compared to 3.16% in Zaddangi P.H.C. 80.63% of the study respondents sleep inside the house without the mosquito net as compared to 2.16% in Narasapuram and Zaddangi PHC's. 63.39% of the study respondents in Zaddangi P.H.C sleep outside the house and inside the mosquito net. As compared to 11.28% in Duppulapalem P.H.C. 31.33% of the study respondents sleep outdoor without a mosquito net as compared to 1.4% in Narasapuram P.H.C. Chi square=1080.555,d.f=9, p<0.00. 35.73% of the total study respondents were sleeping outside their house without mosquito net. As compared to 29.22%of those who sleeps inside the mosquito net. Overall, 42.16% of the study population seems to be sleeping inside mosquito net whether it is tied inside or outside mosquito net. 92% of the population in Zaddangi P.H.C. is sleeping outside the house and net as compared to 1.4% in Narasapuram P.H.C. the usage of the mosquito net seems to be highest in Narasapuram PHC. Both inside and outside accounts for 95% as compared to 7.09% in Zaddangi P.H.C. 68.3% of the study respondents in Duppulapalem sleep inside the house without mosquito net as compared to 12% who sleep inside the mosquito net. Chi square=1108.347,d.f=9, p<0.0**01(fig-4).**

Figure-4:P.H.C wise distribution of study respondents sleeping habits during night time



Knowledge on malaria-personal protective measures against mosquito bite at work-

100% of the respondent had mosquito bites during their work in the fields. None of them were using any of the personal protective measures during their work in the forest. They do not have any traditional means of protecting themselves against mosquito bites during work. Nor are they aware of the protection offered by clothing their whole bodies. (Wearing cloths to cover the entire body will not permit them to work in the fields or forest). Majority 96.7%said they cover themselves with blanket during sleep in the forest as compared to a few 3.25% who do not cover them self's during their stay in the forest. Chi square-28.915, d.f-3, p<0.001.Among study respondents 90.16% of respondents store water with lid as compared to 9.84% stores water without lid coverage. Chi square-51.433,d.f-6,p<0.001.Pits with water collections are those which contain water from regular use usually seen in and around bore wells. Whereas rain water collections are those collections of water seen scattered across and around the village.

Small water pits can breed mosquitoes. More than 95% of the study respondents seem to have rain water collections and collection of water in small pits. 100% of rain water collections present in Zaddangi and Duppulapalem P.H.C's. Pit water collections are seen in 100% of the study respondents in Duppulapalem P.H.C. 5.72% of the study households do not seem to have water containing pits as compared to 2.37% without rain water collection.

36.44% of the study respondents have identified fire and smoke to prevent man-mosquito contact as compared to 35.47% of those who identified net and 23.32% who said net and spray. Only 4.75% have identified spray to prevent man mosquito contact. 95.07% in Zaddangi P.H.C are using fire and smoke to prevent man mosquito contact as compared to 9.15% in Narasapuram P.H.C. 90.84% in Narasapuram P.H.C identified net to prevent man mosquito contact as compared to 3.16% in Zaddangi P.H.C. 16.9% of the study respondents in Devipatnam have identified spray to prevent man mosquito contact. None of them had mentioned about personal protective measures. Chi square=1417.393,d.f=9,p<0.00**1(table-4).** 97.35% of the study population seems to use fire and smoke to prevent mosquitoes from entering their house in the evenings. None of their houses had screen for doors and windows.

Table- 4: P.H.C wise distribution of study respondent's knowledge on prevention of man-mosquito contact

Prevention of man mosquito contact	P.H.C'S				Total
	Narasapuram	Zaddangi	Duppulapalem	Devipatnam	
Net	258 (90.84%)	9 (3.16%)	14 (4.92%)	122 (42.95%)	403 (35.47%)
Spray	0	0	6 (2.11%)	48 (16.9%)	54 (4.75%)
Net and spray	0	5 (1.76%)	225 (79.22%)	35 (12.32%)	265 (23.32%)
Fire and smoke	26 (9.15%)	270 (95.07%)	39 (13.73%)	79 (27.81%)	414 (36.44%)
Total	284 (25%)	284 (25%)	284 (25%)	284 (25%)	1136 (100%)

61.61% of the study respondents have said they have no knowledge of personal protection methods as compared to 38.28% have knowledge about personal protective methods. 95.42% in Zaddangi P.H.C seem to have knowledge on personal protective measures as compared to nil in Narasapuram P.H.C and 17.25% in Duppulapalem P.H.C. Devipatnam P.H.C seems to have 40.85% of the respondents who have knowledge on personal protective measures and 59.15% who do not seem to have knowledge on personal protective measures. Chi square=621.956, d.f=3, p<0.00**1 (table-5).**

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Table- 5: P.H.C wise distribution of study respondent's knowledge on personal protective measures

Are you aware of personal protective measures	P.H.C's				Total
	Narasapuram	Zaddangi	Duppulapalem	Devipatnam	
Yes	0	271 (95.42%)	49 (17.25%)	116 (40.84%)	436 (38.38%)
No	284 (100%)	13 (4.57%)	235 (82.74%)	168 (59.15%)	700 (61.61%)
Total	284 (25%)	284 (25%)	284 (25%)	284 (25%)	1136 (100%)

DISCUSSIONS

In our study all of the respondents heard about the disease malaria. As far the cause is concerned 39.8% mentioned ghost while strolling in the forest, 28.83% mentioned evil eye and 32.51% mentioned black magic voodoo as the causes for malaria. 19.54% of the participants said mosquito bite as cause of malaria.Adedoten et al in their study Reported Mosquito bite was the cause of malaria in 93.2% showing better results than our study[7]. We reported misconceptions as 39.8% mentioned ghost while strolling in the forest, 28.83% mentioned evil eye and 32.51% mentioned black magic voodoo as the causes for malaria.Leku.LH also reported in his study 42% has misconceptions about cause of malaria which is a similar finding to our study[8]. Kyawt-kyawt-swe et al also reported misconceptions in 38% again a similar finding correlating with our study[9]. In our study we reported 55.01% of the study respondents took treatment from both traditional healer and multipurpose health worker male. Soan.V et al in their study reported Malaria was generally treated by various traditional practices including herbal remedies similar to our study. We reported 100% of the respondent had mosquito bites during work in the fields and none of them were using any of the personal protective measures during their work in the forest. Kyawt-kyawt-swe et al reported 91% contract malaria when they went into the forest had mosquito bites again a similar study. We reported in our study 36.44% of the study respondents have identified fire and smoke to prevent man-mosquito contact. Soan.V et al also reported in their study 69% used smoke made by burning of leaves/wood to avoid mosquito bites,7.9% used oil on skin which is available with them similar to our study[10]. No one of our participants had screen for doors and windows. Adedoten et al in their Reported 8.9% households did not have screening nets on their windows, 6.3% had rusted and torn screens in this finding it shows a better practice than our study. In our study 61.61% of the study respondents have said they have no knowledge of personal protection methods.

Conclusions-

All of the respondents heard about the disease Called malaria. As the causes for malaria only few know mosquito bite. They have average knowledge on diagnosis and treatment. Poor knowledge in personal protective measures. Average knowledge in prevention and control of malaria. Half of them were in the choice of traditional remedies and traditional healers. With the increasing education levels, we can reduce the knowledge gaps regarding malaria. Those who have knowledge were not practising preventive measures. Periodic demonstration of preventive practices sessions to be conducted by local voluntaries with the help of health care providers

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REFERENCES-

1. W.H.O. Malaria fact sheet updated 2018 April.www.who.int/mediacentre/factsheets/fs094/en/, accessed on April 23, 2018.
2. World Health Organization, Malaria situation in india.www.searo.who.int/india/topics/malaria/en/.
3. Singh N, Singh OP, Sharma VP. Dynamics of malaria transmission in forested and deforested region of Mandla district: Central India, Madhya Pradesh. J Am Mosq Cont Assoc 1996; 12: 225-34.
4. Sundararajan R, Kalkonde Y, Gokhale C, Greenough PG, Bang A. Barriers to malaria control among marginalized tribal communities: a qualitative study. PLoS One 2013; 8: e81966.
5. Singh N, Chand SK, Bharti PK, Singh MP, Chand G, Mishra. AK, et al. Dynamics of forest malaria transmission in Balaghat district, Madhya Pradesh, India. PLoS One 2013; 8: e73730.
6. Sharma SK, Jalles S, kumar K. rahman S.J.Knowledge, Attitude and Beliefs about malaria in a tribal area of Baster district (M.P): Indian J public health;1993[oct-dec: 37(4)-129-32].Pubmed: 8077001.
7. Adedoten, O.A More wkeji and A.B Odaibo et al: Knowledge, Attitudes and practices about malaria in an urban community south west Nigeria. Journal of vector borne diseases. September 1, 2010: page 155-159.
8. Leku LH. (2000); community knowledge and attitudes and contributions of malaria control in Metu sub-country, Moyo district (unpublished dissertation) Makerere university IPH, Kampala.
9. Kyawt-kyawt-swe and Alan Pearson: knowledge, attitudes and practices with regard to malaria control in an endemic rural area of Myanmar: volume35, no.1, March 2004, South East Asian Trop Med public health.
10. Soan.V, Gyan Chand; Knowledge attitude and practice towards malaria in tribal community of baigachak area, Dindori District (M.P). proceedings of national symposium on tribal health (appro 2003).

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