Original Research Article

Knowledge attitude and behavior practices regarding clinical presentation, transmission, preventive measures and management of malaria and dengue among the health care personnel

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ABSTRACT

Background: According to WHO, in 2020, there were an estimated 241 million cases of malaria worldwide. The estimated number of malaria deaths stood at 627000 in 2020. Similarly, the global incidence of dengue has grown dramatically with about half of the world's population now at risk. The present study is an attempt to assess the knowledge attitude and behaviour practices regarding clinical presentation, transmission, preventive measures and management of malaria and dengue among the health care personnel (HCPs).
Methods: The present cross-sectional study was carried out in the department of community medicine, MGM medical college Indore. Among one tribal (Barwani) and one non-tribal district of Indore, participant selection was done by simple random sampling technique using chit method of all districts covered under Indore division. The ethical clearance was obtained from our institute ethical committee.
Results: The advice given by all the HCPs for the prevention of malaria infection is eradication of breeding site of mosquito by preventing water stagnation. The 75% ANMs, 90% lab technicians, 100% MOs, malaria inspectors and MPWs were aware of the time of the bite of female anopheles' mosquito. Majority of the HCPs were aware of the time of the bite of female Aedes mosquito, the warning signs dengue infection and were of the opinion that they give advice of keeping drinking water containers (Cisterns, tanks) tight closed.
Conclusions: All the HCPs were aware of the prominent symptoms of malaria and promoted actively the integrated vector control measures in their allocated areas of work.

Keywords: Dengue, Malaria, Awareness, HCPs

INTRODUCTION

According to WHO, in 2020, there were an estimated 241 million cases of malaria worldwide. The estimated number of malaria deaths stood at 627 000 in 2020.[1] Similarly, the global incidence of dengue has grown dramatically with about half of the world's population now at risk. Although an estimated 100-400 million infections occur each year, over 80% are generally mild and asymptomatic.[2] Some studies have identified that in spite of a major number of dengue patients in urban areas, physicians have lack of knowledge about certain topics and there was a need to update the knowledge of healthcare workers.[3,4] The present study is an attempt to assess the knowledge attitude and behavior practices regarding clinical presentation, transmission, preventive measures and management of malaria and dengue among the HCPs.

METHODS

A Cross-sectional study was carried out in the department of community medicine, MGM medical college Indore to assess the KAP of HCPs about malaria and dengue in one tribal (Barwani) and one non-tribal district (Indore) of Indore division of Madhya Pradesh (M.P), identified based on the simple random sampling technique using chit method of all the 8 districts covered under Indore division. Ethical clearance was obtained from ethical committee of MGM medical college Indore. Our study period from August 2020-July 2021. Study population included HCPs which in their turn included health staff-MOs (Medical officers), Malaria inspectors, multi-purpose workers (MPWs), auxiliary nurse midwife (ANMs) and lab techn who were involved in prevention and management of dengue and malaria in Indore and Barwani districts of MP. Exclusion criteria were those who not given consent for participation and HCPs not involved in dengue, malaria project. By using pre-designed, semi structured questionnaire to study KAP of HCPs-signs, symptoms, clinical presentation, training status etc. Questionnaire validation was done by pilot study conducted among 30 participants. All the HCPs involved in NVBDCP in these 2 districts included in study. At the end of study, in all 72 HCPs studied including 36 ANMs, 10 lab technicians, 2 malaria inspectors, 21 MO and 3 MPWs included and interviewed in study from Indore and Barwani districts. Data analysis done using SPSS software v22.

RESULTS

All ANMS were female, 50% lab technician's female, 100% malaria inspector were males; 62% Mos-males and 38% were females; 100% MPWs males (Table 1).

Thus, in all 36 ANMs, 10 lab technicians, 2 malaria inspectors, 21 medical officers and 3 MPWs included and interviewed in study from Indore and Barwani district.

Income of all ANMs was in the range of 5000-35000 INR per month, of lab technicians in range of 25000->45000 pm, Malaria Inspector in range of 35000-45000 INR/month; of MOs in the range of >45000 pm and MPWs in range of 15000-35000 INR/ month (Table 2).

The 94% ANMs and 67% MPWs have secondary level of education; rest all (Lab technicians, MO, malaria

inspectors) are graduates and above level of education.

The 72% of total ANMs, 90% of lab technicians, 50% malaria inspectors 66.7% medical officers and 66.7% MPWs interviewed in the study were from Indore district. Most of the HCPs were having experience in the range of 1-14 years of work experience in their respective service (Table 3).

ANMs were uniformly posted in all the levels of health care delivery with 50% posted in PHCs; lab technicians, malaria inspectors, medical officers and MPWs were posted in CHCs and PHCs and not in SHCs. 63.9% ANMs reported both *P. vivax* and *P. falciparum* in their respective field areas. Only 33% ANMS and 66.7% MPWs expressed to have reported only *P. vivax* in their respective field areas; 2.8% ANMs expressed to have reported only *P. falciparum* in their respective field areas reported; Invariably all HCPs have expressed to have reported both in their respective field areas (Table 4).

The 75% ANMs, 90% lab technicians, 100% MOs, malaria inspectors and MPWs were aware of the time of the bite of female anopheles' mosquito. Most common advice given by all the HCPs for the prevention of malaria infection is eradication of breeding site of mosquito by preventing water stagnation (Table 5).

All the HCPS were aware of the prominent symptoms of malaria. Majority of the HCPs (95.8%) were aware of the time of the bite of female Aedes mosquito (Table 6).

The 94.4% ANMs, 100% lab technicians, malaria inspector, MOs and MPWs are trained in government of India clinical management of malaria guidelines. The 61% ANMs, 60% lab technicians, 100% malaria inspectors, 57.1% medical officers and 66% MPWs were of the opinion that there is no referral of patients to private laboratory for malaria diagnosis (Table 7).

Majority of HCPs (94.44%) were of the opinion that they give advice of keeping drinking water containers (Cisterns, tanks) tight closed and removing containers that accumulate clean water for the prevention of Dengue infection (Table 8).

Majority of HCPs (81.9%) were aware of the warning signs dengue infection (Table 9).

Table 1: Age and sex distribution of HCPs involved in prevention and control of dengue and malaria in Indore and Barwani district.

Variables	ANM, N (%)	Lab technician, N (%)	Malaria inspector, N (%)	MO, N (%)	MPW, N (%)	Total, N (%)
Age distribution (years)						
<30	10 (27.8)	1 (10)	0	1 (4.8)	0	12 (16.7)
31-40	21 (58.3)	6 (60)	0	15 (71.4)	1 (33.3)	43 (59.7)
41-50	4 (11.1)	2 (20)	2 (100)	3 (14.3)	2 (66.7)	13 (18.1)
>51	1 (2.8)	1 (10)	0	2 (9.5)	0	4 (5.5)
Total	36 (100)	10 (100)	2 (100)	21 (100)	3 (100)	72 (100)

Continued.

Variables	ANM, N (%)	Lab technician, N (%)	Malaria inspector, N (%)	MO, N (%)	MPW, N (%)	Total, N (%)
Sex distribution						
Male	0	5 (50)	2 (100)	13 (61.9)	3 (100)	23 (31.9)
Female	36 (100)	5 (50)	0	8 (38.1)	0	49 (68.1)
Total	36 (100)	10 (100)	2 (100)	21 (100)	3 (100)	72(100)

Table 2: Education and income wise classification of HCPs involved in prevention and control of dengue and malaria in Indore and Barwani district.

Variables	ANM, N (%)	Lab technician, N (%)	Malaria inspector, N (%)	MO, N (%)	MPW, N (%)	Total, N (%)
Education						
Secondary	34 (94)	0	0	0	2 (67.7)	36 (50)
Graduate and above	2 (5.6)	10 (100)	2(100)	21(100)	1 (33.3)	36 (50)
Total	36 (100)	10 (100)	2 (100)	21 (100)	2 (100)	72 (100)
Income-wise distribution (INR)						
5000-15000	18 (50)	0	0	0	0	18 (25)
15000-25000	16 (44)	0	0	0	1 (33)	17 (23.6)
25000-35000	2 (5.6)	6 (60)	0	0	2 (66.7)	10 (13.9)
35000-45000	0	3 (30)	2 (100)	0	0	5 (6.9)
>45000	0	1 (10)	0	21 (100)	0	22 (30.6)
Total	36 (10)	10	2	21	3 (100)	72 (100)

Table 3: Distribution of HCPs in the two identified districts based on their cadres and years of experience.

Variables	ANM, N (%)	Lab technician, N (%)	Malaria inspector, N (%)	MO, N (%)	MPW, N (%)	Total, N (%)
District (Tribal/ Non-Tribal)						
Barwani (tribal)	10 (27.8)	1 (10)	1 (50)	7 (33.3)	1 (33.3)	20 (27.8)
Indore (non-tribal)	26 (72.2)	9 (90)	1 (50)	14 (66.7)	2 (66.7)	52 (72)
Total	36 (100)	10 (100)	2 (100)	21 (100)	3 (100)	72 (100)
Years of experience						
1-4	13 (36.1)	0	0	9 (42.9)	0	22 (30.6)
5-9	16 (44.4)	4 (40)	0	6 (28.6)	1 (33.3)	27 (37.5)
10-14	6 (16.7)	5 (50)	1 (50)	2 (9.5)	1 (33.3)	15 (20.8)
15-19	1 (2.8)	0	1 (50)	2 (9.5)	1 (33.3)	5 (6.9)
>19	0	1 (10)	0	2 (9.5)	0	3 (4.2)
Total	36 (100)	10 (100)	2 (100)	21 (100)	3 (100)	72 (100)

Table 4: Distribution of HCPs based on level of health care delivery were posted and respective field area.

Variables	ANM, N (%)	Lab technician, N (%)	Malaria inspectors, N(%)	MO, N (%)	MPW, N (%)	Total, N (%)
Level of health care delivery where posted						
Community health centre	4 (11.1)	4 (40)	2 (100)	6 (28.6)	2 (66.7)	18 (25)
Primary health centre	18 (50)	6 (60)	0	15 (71.4)	1 (33.3)	40 (55.6)
Sub centre	14 (38.9)	0	0	0	0	14 (19.4)
Total	36 (100)	10 (100)	2 (100)	21 (100)	3 (100)	72 (100)
Respective field area						
P. vivax only	12 (33)	0	0	0	2 (66.7)	14 (19.4)
P. falciparum only	1 (2.8)	0	0	0	0	1 (2.8)
Both *P. vivax, P. falciparum*	23 (63.9)	10 (100)	2 (100)	21 (100)	1 (33.3)	57 (79.2)
Total	36 (100)	10 (100)	2 (100)	21 (100)	3 (100)	72 (100)

Table 5: Knowledge of HCPs regarding the time of the bite of female anopheles mosquito and advice given by HCPs for the prevention of malaria infection.

Variables	ANM, N (%)	Lab technician, N (%)	Malaria inspector, N (%)	MO, N (%)	MPW, N (%)	Total, N (%)
The time of the bite of female anopheles						
Day time, throughout the day	4 (11.1)	1 (10)	0	0	0	5 (6.9)
Dusk and dawn	27 (75)	9 (90)	2 (100)	21 (100)	3 (100)	62 (86.1)
No idea	5 (13.9)	0	0	0	0	5 (6.9)
Total	36 (100)	10 (100)	2 (100)	21 (100)	3 (100)	72 (100)
Advice given by HCPs						
Eradication of breeding site of mosquito by preventing water stagnation	25 (34.72)	9 (12.5)	2 (2.77)	0 (0)	1 (1.38)	37 (51.38)
Use of mosquito mat, coils, and liquid vaporizer mosquito spray/ fumigation	4 (5.55)	1 (1.38)	0 (0)	0 (0)	0 (0)	5 (6.9)
Use of mosquito net for protect mosquito bite	7 (9.72)	0 (0)	0 (0)	0 (0)	1 (1.38)	8 (11.1)
All options (S. no.1, 2 and 3)	0 (0)	0 (0)	0 (0)	21 (29.16)	1 (1.38)	22 (13.75)
Total	36 (50)	10 (13.8)	2 (2.77)	21 (29.16)	3 (4.16)	72 (100)

Table 6: Knowledge regarding prominent symptoms of malaria among HCPs and time of the bite of female aedes.

Variables	ANM, N (%)	Lab technician, N (%)	Malaria inspector, N (%)	MO, N (%)	MPW, N (%)	Total, N (%)
High fever, chills, rigors, headache, nauseas-symptoms of malaria						
Yes	36 (100)	10 (100)	2 (100)	21 (100)	3 (100)	72 (100)
No	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Total	36 (100)	10 (100)	2 (100)	21 (100)	3 (100)	72 (100)
Time of the bite						
Day time, throughout the day	33 (91.7)	10 (100)	2 (100)	21 (100)	3 (100)	69 (95.8)
Only night time	3 (8.3)	0	0	0	0	3 (4.2)
Total	36 (100)	10 (100)	2 (100)	21 (100)	3 (100)	72 (100)

Table 7: Training of HCPs in government of India clinical management of malaria guidelines.

Variables	ANM, N (%)	Lab technician, N (%)	Malaria inspector, N (%)	MO, N (%)	MPW, N (%)	Total, N (%)
Training in government of India clinical management of malaria guidelines						
Yes	34 (94.4)	10 (100)	2 (100)	21 (100)	3 (100)	70 (97.2)
No	2 (5.6)	0	0	0	0	2 (2.8)
Total	36 (100)	10 (100)	2 (100)	21 (100)	3 (100)	72 (100)
Opinion about private lab						
Yes	0	1 (10)	0	0	0	1 (1.38)
No	22 (61)	6 (60)	2 (100)	12 (57.1)	2 (66.6)	44 (61.11)
No idea	14 (39)	3 (30)	0	9 (42.9)	1 (33.3)	27 (37.5)
Total	36 (100)	10 (100)	2 (100)	21 (100)	3 (100)	72 (100)

Table 8: Advice given by HCPs for the prevention of dengue infection.

Advice given for the prevention of dengue infection	ANM, N (%)	Lab technician, N (%)	Malaria inspector, N (%)	MO, N (%)	MPW, N (%)	Total, N (%)
Keep drinking water containers (Cisterns, tanks) tight closed	1 (2.8)	1 (10)	0	0	0	2 (2.8)
Remove containers that accumulate clean water	2 (5.6)	0	0	0	0	2 (2.8)
Both options (S. no.1 and 2)	33 (91.7)	9 (90)	2 (100)	21 (100)	3 (100)	68 (94.44)
Total	36 (100)	10 (100)	2 (100)	21 (100)	3 (100)	72 (100)

Table 9: Awareness of HCPs regarding the warning signs of dengue infection.

Warning signs dengue infection	ANM, N (%)	Lab technician, N (%)	Malaria inspector, N (%)	MO, N (%)	MPW, N (%)	Total, N (%)
Abdominal pain or tenderness	0	1 (10)	0	0	0	1 (1.4)
Laboratory finding of rapid decrease in platelets count	0	0	0	0	1 (33.3)	1 (1.4)
Lethargy and restlessness	3 (8.3)	1 (10)	0	0	1 (33.3)	5 (6.9)
Mucosal bleed	6 (16.7)	0	0	0	0	6 (8.3)
All of them (S. no 1, 2, 3 and 4)	27 (75)	8 (80)	2 (1.6)	21 (100)	1 (33.3)	59 (81.9)
Total	36 (100)	10 (100)	2 (100)	21 (100)	3 (100)	72 (100)

Table 10: Training of HCPs in government of India clinical management of dengue guidelines.

Variables	ANM, N (%)	Lab technician, N (%)	Malaria inspector, N (%)	MO, N (%)	MPW, N (%)	Total, N (%)
Training of HCPs in government of India clinical management of dengue guidelines						
Yes	34 (97.1)	10 (100)	2 (100)	21 (100)	3 (100)	70 (98.6)
No	1 (2.9)	0	0	0	0	1 (1.4)
Total	35 (100)	10 (100)	2 (100)	21 (100)	3 (100)	71 (100)
Opinion about private diagnosis						
Yes	1 (2.8)	0	0	0	0	1 (1.4)
No	26 (72.2)	3 (30)	0	15 (71.4)	1 (1.9)	45 (62.5)
No idea	9 (25)	7 (70)	2 (100)	6 (28.6)	2 (66.7)	26 (36.1)
Total	36 (100)	10 (100)	2 (100)	21 (100)	3 (100)	72 (100)

Majority of HCPs (98.6%) are trained in government of India clinical management of dengue guidelines. The 72.2% ANMs, 70% lab technicians, 100% malaria inspectors and 71.4% medical officers were of the opinion that there is no referral of patients to private laboratory for dengue diagnosis (Table 10).

DISCUSSION

Vector borne diseases have affected mankind since ages. HCPs are actively involved in various activities to combat these diseases. Amidst all these activities, there is a continuous need to assess the knowledge attitude and behaviour practices of HCPs and general population about vector borne diseases in general and malaria and dengue in particular. The present study is an attempt to assess the knowledge attitude and behaviour practice of health personnel. In present study 75% ANMs, 90% lab technicians, 100% MOs, malaria inspectors and MPWs were aware of the time of the bite of female anopheles' mosquito. Most common advice given by all the HCPs for the prevention of malaria infection was eradication of breeding site of mosquito by preventing water stagnation. Similar findings were reported by Kishore et al who found the important role played by IEC in the prevention of vector borne diseases particularly malaria and dengue.[5]

Present study reveals that 61% ANMs, 60% lab technicians, 100% malaria inspectors, 57.1% medical officers and 66% MPWs were of the opinion that there was no referral of patients to private laboratory for malaria diagnosis. The 95.8% of the HCPs were aware of the timing of the bite of female Aedes mosquitoes. The 94.44% of HCPs were of the opinion that they gave the advice of keeping drinking water containers (Cisterns, Tanks) tight closed and removing containers that accumulate clean water for the prevention of dengue infection. 81.9% of HCPs were aware of the warning signs of dengue infection. Majority of HCPs (98.6%) were trained in government of India clinical management of dengue guidelines. The 72.2% ANMs, 70% lab technicians, 100% malaria inspectors and 71.4% medical officers were of the opinion that there was no referral of patients to private laboratory for the diagnosis of dengue fever. In the present study, medical officers had reasonably good knowledge of malaria and dengue management. Similar findings were reported by Tsheten et al where they concluded that statistically significant factors associated with higher knowledge included respondents being a medical doctor working in a hospital and experience of having diagnosed dengue.[6]

Like many other studies it is recommended in the present study to have ongoing continuous knowledge update of all the cadres of HCPs in the management and prevention of not only malaria but also all the major vectors borne diseases.[7-10]

Limitations

Assessments of attitudes and practices toward VBDs and vector control have relied on self-reported data collected through self-administered questionnaires and could be affected by we have included in the study a particular professional (healthcare workers), whose awareness level is expected to be high. In addition, they are well-educated and thus there is a significant improvement in the already high knowledge scores. interpretation cannot be extrapolated to the general population as the education level and awareness might not be at par. However, despite these limitations, our findings contribute to our understanding of KAP regarding VBDs in health care workers.

CONCLUSION

While assessing the knowledge attitude and practices regarding clinical presentation, transmission, preventive measure and management of malaria and dengue among the HCPs, it was found that all the HCPs were aware of the prominent symptoms of malaria and promoted actively the integrated vector control measures in their allocated areas of work.

REFERENCES

1. WHO fact sheet malaria. Available at: https://www.who.int/news-room/fact-sheets/detail/malaria#:~:text=In%202020%2C%20there%20were%20an,at%20627%20000%20in%202020. Accessed o 20 March, 2022.
2. WHO fact sheet dengue ace. Available at: https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue. Accessed o 20 March, 2022.
3. Khan F, Kumar S, Fraz TR et al. Knowledge and management practices regarding dengue fever among doctors of tertiary care hospital. Int J Fam Commun Med. 2018;2(5):315-9.
4. Kotepui KU, Manas K, Chuchard P. Knowledge, Attitude, and Practice Related to Malaria Diagnosis among Healthcare Workers in Hospitals: A Cross-Sectional Survey. J Trop Med. 2019;1414079:9.
5. Kishore J, Gupta VK, Singh SV, Garg S, Kaur R. Impact of health education intervention on knowledge and community action for malaria control in Delhi. J Commun Dis. 2008;40:183-92.
6. Tsheten T, Clements ACA, Gray DJ, Gyeltshen K, Wangdi K. Medical practitioner's knowledge on dengue management and clinical practices in Bhutan. PLOS one. 2021;16(7):e0254369.
7. Lu G, Liu Y, Wang J, Li X, Liu X, Beiersmann C et al. Malaria training for community health workers in the setting of elimination: a qualitative study from China. Malaria J. 2018;17(1):95.
8. Awasthi KR, Jancey J, Clements ACA, Leavy JE. A qualitative study of knowledge, attitudes and perceptions towards malaria prevention among people living in rural upper river valleys of Nepal. PLoS ONE. 2022;17(3):e0265561.
9. Wang R, Tang S, Yang J. Improving local health workers' knowledge of malaria in the elimination phase-determinants and strategies: a cross-sectional study in rural China. Malar J. 2017;16:210.
10. Looman L, Christopher Pell. End-user perspectives on preventive antimalarials: A review of qualitative research. Global Public Health. 2021;1-15.
11. Sharp BL, Kleinschmidt I, Streat E, Maharaj R, Barnes KI, Durrheim DN et al. Seven years of regional malaria control collaboration – Mozambique, South Africa, and Swaziland. Am J Trop Med Hyg. 2007;76:42-7.
12. Alilio MS, Bammek J. A KAP study in Zanzibar: Implications for prevention and control: A study conducted for UNICEF sub-office Zanzibar. Eval Programme Planning. 1998;21:409-13.