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MALARIA AWARENESS AND PREVENTION PRACTICES AMONG TRIBAL INDIVIDUALS IN SOUTHERN ODISHA, INDIA: A CROSS-SECTIONAL STUDY

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ABSTRACT

This cross-sectional study examined malaria awareness and prevention practices among 245 tribal inhabitants in the Koraput district of Odisha, a region highly affected by malaria. Data regarding knowledge, attitudes, and practices related to malaria were collected using structured questionnaires. The study found that the community had moderate levels of awareness and understanding about malaria, with an average knowledge score of 67%. Males had slightly higher knowledge scores compared to females. The attitude score was 80.57%, indicating a generally positive mindset towards malaria prevention. In terms of practices, the score was 78.67%, reflecting a fair adoption of preventive measures like mosquito net usage and maintenance of environmental cleanliness. The study emphasized the crucial role of health workers as the primary source of information about malaria prevention. However, it also identified gaps in women's understanding of malaria symptoms and transmission, as well as the limited diversity in information channels. The findings suggest the need for more targeted educational initiatives and community-centric health strategies to enhance overall health practices in tribal communities affected by malaria.

Keywords: *malaria; knowledge; attitude; practice; Koraput*

INTRODUCTION

Malaria is a life-threatening, vector-borne disease transmitted through the bite of an infected Anopheles mosquito [1]. The latest World Malaria Report indicated that there were 241 million cases in 2020, a rise from 227 million in 2019. According to the latest World Malaria Report 2023, the global malaria

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situation has worsened since the COVID-19 pandemic [2]. The number of global malaria cases in 2022 was significantly higher than before the pandemic in 2019, reaching approximately 249 million cases, an increase of 5 million from 2021 [2, 3]. Similarly, the number of global malaria deaths in 2022 was higher than in 2019, with an estimated 608,000 deaths, a 32,000 increase from the pre-pandemic period [1]. Notably, India represents 3% of the global malaria burden [4]. Koraput, a district in the southern region of Odisha state with a large tribal population, has been highly endemic to falciparum malaria for years. [5]. While numerous studies have been conducted on malaria in the Koraput district, no significant improvements have been observed. High malaria incidence and related deaths continue to be a challenge in the area. Therefore, the present study aims to evaluate the community's knowledge, attitude, and practices regarding the disease.

MATERIALS AND METHODS

Study design and data collection

The present cross-sectional study was conducted among 245 Paraja tribal individuals selected randomly. The data were collected using structured questionnaires. The questionnaires were designed to evaluate various aspects of the respondents' knowledge about malaria (causes, treatment, transmission, etc.), their attitudes towards malaria (readiness for treatment, participation in anti-malaria programmes), and their practices (use of mosquito nets, preventive measures, etc.).

Data analysis

The responses were analysed quantitatively. The knowledge, attitudes, and practices were scored, and the mean scores were calculated. For every correct/positive response, 1 point was assigned, and for incorrect/negative responses, 0 points were assigned during score calculation. Comparative analysis was conducted to assess the relationship between proper knowledge, positive attitude and good practice towards malaria. MS Excel was used for the sorting and scoring of data. The data analysis was done by using SPSS-22. Statistical significance was considered at the p-value ≤ 0.05.

Validity and reliability

The questionnaire was pre-tested on a small sample (n = 67) to ensure clarity, relevance, and comprehensiveness. Necessary modifications were made based on the feedback received to enhance the validity and reliability of the tools.

Ethical considerations

Informed consent was obtained from all participants prior to their participation in the study. The confidentiality and anonymity of the respondents were maintained throughout the research process.

RESULTS

A total of 245 tribal individuals (belonging to the Paraja tribe) were included in the current study, comprising 134 (54.69%) males and 111 (45.31%) females. The age range of the individuals was 15–68 years with a mean age of 34.6 ± 6.8 years.

Table 1 depicts the respondents' knowledge about malaria. The majority (84.08%) have heard about or are generally aware of malaria, with a higher percentage among males (88.8%) compared to females (78.37%). Regarding malaria causes, 81.22% of respondents were knowledgeable, with males showing slightly higher awareness (87.31%) again than females (73.87%). Knowledge about malaria treatment was acknowledged by 78.77% of respondents. A significant proportion of respondents understood that some groups are more prone to malaria (70.61%), and the majority recognised the severity of malaria in children (72.65%) and pregnant women (62.04%). Understanding of malaria transmission was reported by 66.53% of respondents. On a scale of 11, the total mean knowledge score was 7.37, indicating a moderate level of overall knowledge about malaria among the respondents.

Table 1. Status of knowledge about malaria among respondents (only 'yes' responses presented).

Queries	Total		Male		Female		Mean knowledge score
	No.	%	No.	%	No.	%	
Have you heard about malaria?	206	84.08	119	88.8	87	78.37	0.84
Do you know the causes of malaria?	199	81.22	117	87.31	82	73.87	0.81
Do you know the treatment of malaria?	193	78.77	110	82.04	83	74.77	0.79
Are some people more prone to getting malaria	173	70.61	96	71.64	77	69.36	0.71
Is malaria severe in children?	178	72.65	95	70.89	83	74.77	0.73
Is malaria severe in pregnant women?	152	62.04	88	65.67	64	57.65	0.62
Do you know the transmission of malaria?	163	66.53	91	67.91	72	64.86	0.67
Can malaria become normal?	179	73.06	102	76.11	77	69.36	0.73
Do you know about anti-malarial drugs?	146	59.59	80	59.7	66	59.45	0.60
Do you know which test needs to be done to detect malaria?	187	76.32	106	79.1	81	72.97	0.76
Do you know the symptoms of malaria?	29	11.83	15	11.19	14	12.61	0.12
Total mean knowledge score (maximum score = 11)							7.37 (67%)

Figure 1 reveals the sources of knowledge about malaria among the respondents. Health workers were the most cited source (88.57%), followed by relatives (5.71%), friends (3.67%), and neighbours (2.04%). This highlights the significant role health workers play in disseminating information about malaria.

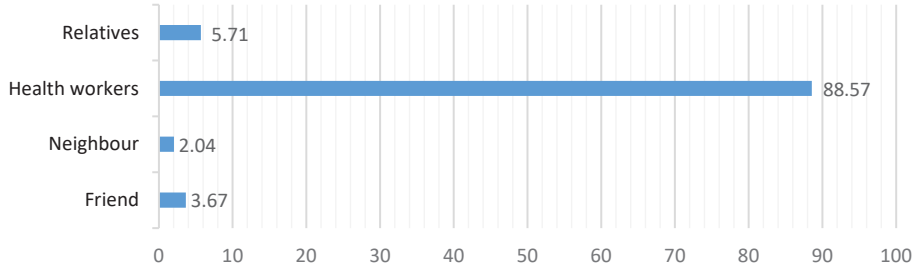

Figure 1. Sources of knowledge about malaria among respondents (%).

Table 2 presents the attitudes towards malaria. A high percentage of respondents (97.14%) indicated they would take precautions against malaria. Additionally, 96.32% participate in anti-malaria immunization programmes. The readiness for immediate treatment for fever was noted by 76.32% of respondents, and 53.87% agreed that the government should implement malaria awareness programmes. The mean attitude score was 3.24 out of a possible 4.

Table 2. Status of attitude towards malaria among respondents (only 'yes/positive' responses presented).

Queries	Total		Male		Female		Mean attitude score
	No.	%	No.	%	No.	%	
Immediate treatment for fever	187	76.32	101	75.37	86	77.47	0.76
Government should implement malaria awareness programmes	132	53.87	74	55.22	58	52.25	0.54
Participates in anti-malaria immunization	236	96.32	131	97.76	105	94.59	0.96
Precaution will be taken	238	97.14	131	97.76	107	96.39	0.97
Total mean attitude score (maximum score = 4)							3.24 (80.57%)

Table 3 shows the practices adopted by respondents to combat malaria. Most respondents (99.18%) reported closing windows while sleeping and 98.36% owned mosquito nets. Regular use of mosquito nets was reported by 93.06%, and nearly all respondents (99.59%) stated that they cleared their household surroundings to prevent malaria. The use of repellents was less common, with only 17.14% reporting their use. The total practice score was 9.44 out of 12, reflecting good practical measures taken by the respondents to prevent malaria.

Table 3. Status of practices related to malaria among respondents (only 'yes' responses presented).

Queries	Total		Male		Female		Mean practice score
	No.	%	No.	%	No.	%	
Has a mosquito net	241	98.36	131	97.76	110	99.09	0.98
Sleeps under mosquito net	228	93.06	124	92.53	104	93.69	0.93
Uses mosquito coil	111	45.3	64	47.76	47	42.34	0.45
Burns cow dung or leaves	174	71.02	93	69.4	81	72.97	0.71
Closes windows while sleeping	243	99.18	133	99.25	110	99.09	0.99
Covers arms and legs	223	91.02	121	90.29	102	91.89	0.91
Drinks boiled water	148	60.4	82	61.19	66	59.45	0.60
Clears household surroundings	244	99.59	134	100	110	99.09	1.00
Buries mosquito sites	240	97.95	132	98.5	108	97.29	0.98
Spreads DDT	176	71.83	97	72.38	79	71.17	0.72
Uses repellent	42	17.14	27	20.14	15	13.51	0.17
Washes bed nets	244	99.59	134	100	110	99.09	1.00
Total mean practice score (maximum score = 12)							9.44 (78.67%)

While comparing the percentage scores of proper knowledge, positive attitude, and good practice, with respective percentages of 67%, 80.57%, and 78.67%, this figure indicates that while there is a high level of positive attitude and good practice, the level of proper knowledge about malaria is comparatively lower.

DISCUSSION

This study offers valuable insights into the knowledge, attitudes, and practices related to malaria among tribals residing in the Koraput district of Odisha. The findings could help in the implementation of targeted interventions and educational programmes to reduce the prevalence of malaria and improve the overall health outcomes of this marginalized community.

The study indicates that while the majority of the population is aware of malaria and its severity, there is a need, particularly in children and pregnant women, to enhance understanding of malaria symptoms and transmission

methods. The mean knowledge score of 7.37 out of 11 indicates a moderate level of overall knowledge about malaria. The gender disparity in knowledge, with males showing higher awareness than females, emphasizes the importance of focused educational programmes that ensure equal access to information for every community member. This finding is also supported by a recent study conducted in Odisha [6]. The majority, 72.65%, acknowledged that malaria poses severe threats to children and pregnant women. In contrast, Gupta et al. found that even 92.5% viewed malaria as a grave health issue [7].

Studies conducted in tribal areas of Koraput indicate that, although people generally have a high level of awareness about malaria, their knowledge of specific symptoms, transmission, and prevention methods is often inadequate, particularly among women [8]. Health workers are the primary source of information about malaria, which is consistent with other studies conducted in similar settings [9]. While this highlights the importance of health workers in disseminating information, it also suggests that there may be an over-reliance on them. Therefore, it is essential to diversify the sources of information, including leveraging community networks and technology-based interventions. This approach could improve the reach and effectiveness of educational campaigns [10].

The findings of our study show that people in many parts of Odisha rely heavily on health workers for information, which is a common situation. However, due to the challenging terrain and remote locations of tribal areas, relying solely on health workers can result in knowledge gaps [11]. Therefore, it is essential to adopt a more diversified approach that includes community-based strategies and digital health initiatives. Such strategies have shown potential in similar settings and can help overcome the limitations of relying solely on health workers [12].

The study revealed a highly positive attitude towards malaria prevention and treatment (the attitude score was 3.24 out of 4.). This is evident from significant participation in anti-malaria immunization programs and readiness for immediate treatment. Such a positive attitude is of utmost importance for the successful implementation of malaria control strategies [13]. However, the lower level of agreement regarding the government's implementation of malaria awareness programmes suggests a gap between individual readiness and perceived governmental support. This gap could be bridged through more visible public health campaigns and active community engagement. The results of the study reflect the broader trend in Odisha where increased community engagement and government initiatives have led to improved attitudes towards

malaria control [14]. However, the perception of inadequate governmental support in malaria awareness, as indicated by our respondents, highlights the need for more visible and effective public health campaigns. This challenge is also reflected in other parts of Odisha. The practice score was found satisfactory among the studied population (9.44 out of 12). The frequent use of mosquito nets and other preventative measures within households indicates that the community is taking good practical steps to prevent malaria transmission. However, the fact that repellents are not commonly used suggests that there is room for improvement in personal protective practices. This is especially important given recent research that highlights the crucial role of individual protective measures in preventing malaria [2]. Encouragingly, 97.14% took precautions or malaria medications, aligning with Krause et al. [15] where 81% received and 91% purchased drugs.

CONCLUSION

This study highlights a generally positive attitude toward prevention of malaria (80.91%) and strong preventive practices (78.70%) among the tribal population of Koraput district. Nearly all respondents (99.18%) reported closing windows while sleeping, and 98.36% owned mosquito nets, with 93.06% regularly using them. However, knowledge about malaria remained moderate, with only 67% demonstrating proper understanding, particularly regarding transmission (66.53%) and symptoms. Gender disparities were evident, as males consistently showed higher awareness (88.8%) compared to females (78.37%). Health workers were identified as the primary source of information by 88.57% of respondents, but the reliance on a limited range of sources suggests the need for more diverse communication strategies. The findings highlight a crucial need for targeted educational interventions, particularly to improve knowledge in areas such as malaria transmission and to address gender-based gaps in awareness. Expanding health education and leveraging additional information channels will be key to further enhancing malaria prevention efforts in this tribal community.

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DECLARATION OF CONFLICTING INTERESTS

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REFERENCES

1. Shaw W. R., Catteruccia F. (2019). Vector biology meets disease control: using basic research to fight vector-borne diseases. Nature microbiology, 4(1), 20–34. https://doi.org/10.1038/s41564-018-0214-7
2. World Health Organization (2023). World malaria report 2023. World Health Organization. www.who.int/teams/global-malaria-programme/reports/world-malaria-report-2023
3. Lukindu M. (2023). World Malaria Report 2023: a call for concerted action to address growing threats. https://targetmalaria.org/latest/blog/world-malaria-report-2023-a-call-for-concerted-action-to-address-growing-threats/
4. World Health Organization (2019). Malaria. https://www.who.int/news-room/fact-sheets/detail/malaria
5. Sahu S. S., Dash S., Sonia T., Gunasekaran K. (2019). Synergist piperonyl butoxide enhances the efficacy of deltamethrin in deltamethrin-resistant Anopheles culicifacies sensu lato in malaria endemic districts of Odisha State, India. Indian Journal of Medical Research, 149(4), 554–557. https://doi.org//10.4103/ijmr.IJMR_144_18
6. Padhan P., Bindhani B K., Nayak J. K. (2021). Perceptions and practices on malaria in a rural population of Koraput district, Odisha. International Journal of Research in Medical Sciences, 9(5), 1422. https://doi.org/10.18203/2320-6012.ijrms20211880
7. Gupta R. K., Raina S. K., Shora, T. N., Jan R., Sharma R., Hussain S. (2016). A household survey to assess community knowledge, attitude and practices on malaria in a rural population of Northern India. Journal of Family Medicine and Primary Care, 5(1), 101. https://doi.org/10.4103/2249-4863.184632
8. Vijayakumar K. N., Gunasekaran K., Sahu S. S., Jambulingam P. (2009). Knowledge, attitude and practice on malaria: a study in a tribal belt of Orissa state, India with reference to the use of long lasting treated mosquito nets. Acta Tropica, 112(2), 137–142. https://doi.org/10.1016/j.actatropica.2009.07.011

9. Kumar A., Valecha N., Jain T., Dash A. P. (2007). Burden of malaria in India: retrospective and prospective view. Defining and Defeating the Intolerable Burden of Malaria III: Progress and Perspectives: Supplement to Volume 77 (6) of American Journal of Tropical Medicine and Hygiene. https://doi.org/10.4269/ajtmh.2007.77.69
10. Dabson B, Kumar C. (2021). Rural development: a scan of field practice and trends. Aspen Institute, Community Strategies Group. https://coilink.org/20.500.12592/frj5ws
11. Sahoo P M, Rout H. S., Jakovljevic M. (2023). Dynamics of health financing among the BRICS: a literature review. Sustainability, 15(16), 12385. https://doi.org/10.3390/su151612385
12. Källander K., Soremekun S., Strachan D. L., Hill Z., Kasteng F., Kertho E., Kirkwood B. (2023). Improving community health worker treatment for malaria, diarrhoea, and pneumonia in Uganda through inSCALE community and mHealth innovations: A cluster randomised controlled trial. PLOS Digital Health, 2(6), e0000217. https://doi.org/10.1371/journal.pdig.0000217
13. Hussain M. A., Dandona L., Schellenberg D. (2013). Public health system readiness to treat malaria in Odisha State of India. Malaria Journal, 12(1), 1–11. https://doi.org/10.1186/1475-2875-12-351
14. Krause G., Sauerborn R. (2000). Comprehensive community effectiveness of health care. A study of malaria treatment in children and adults in rural Burkina Faso. Annals of Tropical Paediatrics, 20(4), 273–282. https://doi.org/10.1080/02724936.2000.11748147

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