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Democratic Republic of the Congo**



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Knowledge, Attitude and Practice of Healthcare Providers on the Management of Malaria Cases in the Province of Tshopo, Democratic Republic of the Congo



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ABSTRACT

Purpose: The objective of this study was to determine knowledge, attitudes and practices relating to malaria, the control strategy (preventive and curative) and the circulation of antimalarials in order to establish a behavioral basis and their implications for the control of malaria, a scourge that is decimating our populations.

Methodology: a cross-sectional study was conducted from August 24 to December 24, 2022 in the province of Tshopo in the DRC. The data for the present study were collected from 150 providers who voluntarily agreed to answer our questions in 4 malaria case management structures.

Findings: more than half of the subject had knowledge of malaria, there was a statistically significant association with malaria treatment according to national guidelines $p < 0.001$ and malaria resistance $p < 0.001$. More than half of providers report their malaria cases and 1/3 do not report which showed a statistically significant association $p < 0.001$ and not referring showed a statistically significant association $p < 0.001$.

Unique contribution to theory, practice and policy: Adherence to national guidelines remains a major challenge in the strategy to combat malaria in this part of the DRC. It is imperative to initiate formative supervision in case management structures and also awareness campaigns for adherence to national policy.

Keywords: Knowledge, Attitudes, Practices, Providers, Care, Malaria Tshopo, DRC

Introduction

Nearly half of the world's population was at risk of malaria. The number of cases was estimated at 247 million and the number of deaths attributable to malaria at 619,000 in 2021. The World Health Organization (WHO) African Region bears a large and disproportionate share of the global malaria burden with 95% of malaria cases and 96% of deaths due to the disease recorded in this Region. Children under 5 years of age accounted for approximately 80% of malaria deaths [1].

In Democratic Republic of the Congo, malaria is responsible for 39.3% of reasons for outpatient consultations among children under 5 years old and 39% for all ages combined, 39.1% of deaths occurring among those < 5 years old in hospitalizations and 27.2% for all ages combined; 36.6% of hospitalizations in children < 5 years old; 6% of hospital mortality from malaria in children under 5 years old 39.3% of outpatient consultations for children under 5 years old [2].

Thirty-eight percent (38%) of children living in the Tshopo province were carriers of *Plasmodium* according to the Multiple indicator cluster survey. (MICS) 2018 [3]. This high frequency of the disease would be linked, in addition to the equatorial aspect characteristic of the environment, to the low appropriation of sanitation practices and use of ITNs [4]. The global fund to fight HIV/AIDS, tuberculosis and malaria provides health structures with drugs for the prevention and treatment of malaria in public health care establishments in this province and the subsidy of therapeutic combinations based on of artemisinin through the mechanism of the Financial Markets Authority (AMF) for the city of Kisangani [4].

This support provided by the Global Fund through Rural Health (SANRU Asbl) aims to promote anti-malaria interventions in accordance with the recommendations of the NMCP. The NMCP guidelines recommend: (i) prevention through the use of ITNs distributed in mass campaigns to the entire population and prenatal consultation and preschool consultation to pregnant women and children under one year of age respectively, (ii) intermittent preventive treatment with sulfadoxine-pyrimethamine in pregnant women, (iii) promotion of sanitation, (iv) treatment of simple cases at ACT after biological confirmation using malaria rapid diagnostic tests (RDTs) at the level of 1st level ESS , (v) pre-transfer treatment of severe malaria with rectal artesunate , or injectable artesunate intramuscularly if the rectal route cannot be used, (vi) treatment of severe cases with injectable artesunate in the reference ESSs [4] .

These malaria prevention and treatment inputs are free in all public ESSs in the Tshopo province. In addition to the supply of inputs, support activities are carried out such as training of staff on the management of malaria cases, their supervision by ECZs, support for periodic monitoring meetings and monitoring activities. information, education and communication with mothers and caregivers during prenatal consultation and preschool consultation as well as educational talks in public places so that they bring children to the nearest health center at the first signs of illness [4].

Today we die of malaria as a result of being the victim of fake medicines devoid of active ingredient or containing a substandard dose of active ingredient or even from self-medication without biological proof with the major risk of inducing the selection of plasmodial strains resistant to usual antimalarial drugs [5]. In fact, the multi-resistance of *Plasmodium falciparum* which emerged more than twenty years ago and today extends to artemisinin derivatives, the last active drugs in certain countries and the last chance for malaria control. medium term [6]. The knowledge, attitudes and practices of providers constitute means to strengthen the fight against this disease.

The objective of the study was to determine knowledge, attitudes and practices relating to malaria, the control strategy (preventive and curative) and the circulation of antimalarial drugs in order to establish a behavioral basis and their implications for control. malaria, a scourge that is decimating our populations.

METHODS

This is a cross-sectional study conducted from August 24 to December 24, 2022 in the province of Tshopo in the DRC. The data for the present study were collected from 150 providers who voluntarily agreed to answer our questions in 4 malaria case management structures.

A pre-established questionnaire was prepared in French and in Lingala and Swahili, pre-tested in 2 structures not selected in September 2023. Four investigators, all medical students, were trained to collect data for this study. The analysis of the pre-test results made it possible to refine the questionnaire for the present study carried out on a larger scale by the same team. The questionnaire was submitted in French to the providers.

2.2. INCLUSION AND NON-INCLUSION CRITERIA

Any healthcare provider working in the selected structure and who agreed to voluntarily answer the questionnaire was included in the study. Any personnel who did not meet the aforementioned inclusion criteria were not included.

2.3. SAMPLING

The collection of data relating to the knowledge, attitudes and practices of healthcare providers was carried out in 4 malaria case management structures of the provincial health division Tshopo to which we contacted and who responded favorably.

We used non-probability convenience sampling, this allowed us to retain a sample size of 150 providers responding to the study.

2.4. DATA ANALYSIS TECHNIQUE

The data were encoded in Excel and analyzed in STATA 13. The chi-square test was used for the statistical test. P value less than 0.05 was considered significant.

2.5. ETHICAL CONSIDERATION

Free and informed consent was obtained from healthcare providers in each care service.

3. RESULTS

3.1. Sociodemographic characteristics

Table I. Distribution of respondents according to socio-demographic characteristics

Variables	Frequency (n=150)	Percentage (%)
Age		
23 to 27 years old	21	14
28 to 32 years old	58	38.66
>33 years old	71	47.34
Sex		
Male	111	74
Women	39	26
Level of study		
A1	22	14.66
A2	32	21.33
Male nurse	19	12.66
Doctor	77	51.33
Marital status		
Bachelor	99	66
Bride)	13	8.66
Divorcee)	20	13.33
Widower	18	12
Seniority		
<5 years	16	10.66
>5 years	134	89.33

It appears from this table 1 that the most represented age group was 28 to 32 years old, the average of which was 30 years old, the male sex was more represented. We note that a third of the respondents were single with more than five years of service.

2. Knowledge about malaria

Table II. Distribution of respondents according to their knowledge of malaria

Care knowledge	Doctor n=77	Nurse n=19	A1 n=22	A2 n=32
Malaria	73(94.80)	17(89.47)	19(86.36)	28(87.5)
Plasmodium, causative agent	52(67.53)	18(94.74)	20(90.90)	22(68.75)
Sign of gravity	42(54.54)	16(84.21)	7(31.81)	12(37.5)
Treatment of malaria according to national guidelines	37(48)	10(52.63)	9(40.90)	30(93.75)
Malaria resistance	66(85.71)	5(26,31)	7(31.81)	25(78.1)

It appears from this table 2 that, more than half of the subject had knowledge of malaria, we note a statistically significant association with the treatment of malaria according to national guidelines $p < 0.001$ and malaria resistance $p < 0.001$.

Attitude and practices of healthcare providers towards malaria

Table III. Distribution of healthcare providers according to their attitudes and practices regarding malaria

Variables	Doctor n=77	Nurse n=19
Attitudes		
Laboratory before treatment	65(84.41)	17(89.47)
Processing without a laboratory	12(15.59)	2(10.52)
Practice		
Insecticide-impregnated mosquito net	70(90.90)	19(100)
Sanitation	45(58.44)	13(68.42)
Indoor spraying	4(5.19)	5(26.31)
Intermittent preventive treatment (IPT)	52(67.53)	16(84.21)
Antimalarials prescribed to patients with uncomplicated malaria		
ACT	71(92.20)	11(57.89)
Artesunate monotherapy	58(75.32)	7(36.84)
Quinine	33(42.85)	16(84.21)
Others	7(9.09)	0
Antimalarials prescribed to patients with severe malaria		
ACT	13(16.88)	9(47.36)
Artesunate iv	57(74.02)	14(73.68)
Quinine others	62(80.51)	12(63.15)
Others	0	0

It appears from this table 3 that, concerning the practice of providers in the face of malaria, a statistically significant association of intermittent preventive treatment $p < 0.001$; concerning the prescription of antimalarials to patients with uncomplicated malaria, we note a statistically significant association of ACT $p < 0.001$; Artesunate monotherapy $p < 0.001$; Quinine $p < 0.001$ and regarding the prescription to patients with severe malaria, we note a statistically significant association in the taking of ACT $p < 0.001$ and Artesunate iv $p < 0.001$.

Notification and referral of malaria cases by healthcare providers

Table IV: Distribution of subjects according to notification and referral of malaria cases by healthcare providers

Variables	Doctor n=77	Nurse n=19	Total n=96	p
Case reporting				
Yes	62(80.51)	12(63.15)	74(77.08)	0.985
No	15(19.48)	7(36.85)	22(22.92)	<0.001
Reference for complicated cases				
Yes	59(76.62)	9(47.36)	68(70.83)	<0.001
No	18(23.37)	10(52.63)	28(29.17)	<0.001

After bivariate analysis, it appears from this table 4 that more than half of the providers notify their cases of malaria and 1/3 do not notify which showed a statistically significant association $p < 0.001$ and the fact of not referring a showed a statistically significant association $p < 0.001$.

Discussions

We found in table 1 that the most represented age group was between 28 to 32 years old, the average being 30 years old, the male gender was more represented. We note that a third of the respondents were single with more than five years of professional experience. Our result is different from that of Mamadou Saliou Sow et al who found in their study that, out of a total of 29 providers, 86% were doctors and had an age between 29-38 years with professional experience of less than 10 years of which the majority were married [7].

The bivariate analysis showed us in Table 2 that, more than half of the subjects had knowledge of malaria, we note a statistically significant association with the treatment of malaria according to national guidelines $p < 0.001$ and malaria resistance $p < 0.001$. This lack of knowledge among certain

providers could be explained by the insufficient or absence of training of health workers on the new national protocol. Our study is different from that of Ahmed et al. [8] in a similar study in Sudan reported that a third of agents did not know the national guidelines for the treatment of malaria, due to lack of training on the national guidelines

We found in Table 3 that, regarding the practice of providers dealing with malaria, a statistically significant association of intermittent preventive treatment $p < 0.001$; concerning the prescription of antimalarials to patients with uncomplicated malaria, we note a statistically significant association of ACT $p < 0.001$; Artesunate monotherapy $p < 0.001$; Quinine $p < 0.001$ and regarding the prescription to patients with severe malaria, we note a statistically significant association in the taking of ACT $p < 0.001$ and Artesunate iv $p < 0.001$. This result is lower than that found by Sangaré et al. [9] in Mali Bamako who found 57.61% of prescriptions against malaria not containing ACT, higher than that of Soumaré [10] in Senegal with 23.95% of prescriptions for antimalarials as monotherapy. The high rate of non-compliant prescriptions in the private sector could be explained by ignorance of the protocol but also by the unavailability of Artesunate / Amodiaquine in private health services, unlike other public centers. 38% ($n=207$) of children were on monotherapy (chloroquine, quinine, amodiaquine) contrary to the new WHO recommendations. A similar study in rural Cameroon [11] shows that only 2.0% of healthcare professionals had prescribed the recommended Artesunate / Amodiaquine combination. Treatment of malaria with monotherapy increases the risk of the emergence of resistance to antimalarial drugs, note most authors [9, 12,13].

After bivariate analysis, we found in Table 4 that more than half of the providers notify their cases of malaria and 1/3 do not notify which showed a statistically significant association $p < 0.001$ and the fact of not referring showed a statistically significant association $p < 0.001$. This practice is positive but the big problem remains to know whether there is an overestimation or underestimation of the reported cases of malaria cases because the Breman hippopotamus informs us that 80% of cases are treated at home, 15% in dispensaries and finally 5% in reference hospitals [14]. Hence it is interesting to carry out a study to see if the hippopotamus theory remains relevant. In our series, 2/3 of healthcare providers do not refer even if they exceed their competence. This is a dangerous practice because it risks increasing malaria mortality [15,16].

CONCLUSION

Adherence to national guidelines remains a major challenge in the strategy to combat malaria in this part of the DRC. It is imperative to initiate formative supervision in case management structures and also awareness campaigns for adherence to national policy.

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