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Assessment of the health care offer of free malaria treatment among under five children in the Dschang health district

Djam Chefor Alain [1, 2, *], Ayuk Stella Awu [1], Earnest Njih Tabah [1, 2], Ifang Solomon Ndifon [1], Yangeh Linda [1, 2], Djienang Edith Laure Manuella [1], Brenda Motangu [1], Ngobikotok Bernadette [1], Ndongmo Donjio Corine Leader [1] and Ngam Mee-Gi-Nee Deo-Gratias Alleluia [1]

[1] *Department of Public Health, Faculty of Medicine and Pharmaceutical Sciences, University of Dschang, Dschang, Cameroon.*
[2] *Research Initiative in Tropical and Community Health (RITCH)*

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Abstract

Introduction: Malaria is the most widespread endemic disease in Cameroon and is a major public health problem, placing a heavy burden on the well-being of children under the age of 5, who are a vulnerable target. In order to combat this burden, the Cameroonian government has provided free malaria treatment for children under 5 since February 2011 for simple, uncomplicated malaria and since May 2014 for severe malaria. The aim of this study was to describe the provision of free malaria treatment for children under five in the Dschang health district.

Method: This was a descriptive cross-sectional study carried out in the Dschang health district from November 2022 to July 2023 in public and private health facilities providing malaria treatment for children under five. Data were collected using a semi structured questionnaire administered face-to-face to health facility personnel. The data were analysed using SPSS 20 software for proportions, and ArcGIS 10.3.1 for a map of the provision of free malaria treatment in the Dschang health district.

Results: Of the 88 health facilities visited in the Dschang Health District, most personnel that participated were state nurse and where in the rural area, belonging to the 6th category of health facilities and being in the private sector. Only 21 (23.6%) health facilities offering free malaria treatment for children under five in the Dschang Health District. Most health facilities were in need of materials and drug subventions. Most health personnel 74 (84.1%) had a good knowledge on free malaria treatment policy, and the main barrier face by these health facilities was the lack of subvention 71 (80.7%).

Conclusion: Most health facilities do not offer free malaria treatment even if, most of them are well informed about the free malaria treatment policy in Cameroon.

Keywords: Assessment; Free treatment; Malaria; Under five

1. Introduction

Malaria is the most common and most devastating parasitic disease in the world. It is caused by a haematozoan of the genus Plasmodium, transmitted to humans by the bite of a female mosquito of the genus Anopheles during its blood meal [1]. Its symptoms are generally dominated by a rise in temperature with intermittent fevers (greater than or equal to 37.5° C), generalised myalgia, arthralgias, anorexia and headaches. Five (5) plasmodial species have been found in

* Corresponding author: Djam Chefor Alain

humans to date [2]: Plasmodium falciparum, Plasmodium vivax, Plasmodium malaria, Plasmodium ovale, and Plasmodium knowlesi which was recently described in humans and was first discovered in monkeys before expanding to the human population in South-East Asia [1]. Sub-Saharan Africa pays a heavy price for this disease with 90% of cases and 91% of deaths linked to malaria [3]. Malaria is a major factor in poverty because of its negative impact on economic and human development in endemic areas [4]. According to estimates in the WHO Malaria Report 2016, almost half of the world's population was at risk of malaria at the beginning of 2016. Malaria was considered endemic in 91 countries and territories in 2015. An estimated 212 million malaria cases and 429,000 deaths occurred during that year. The WHO African Region bears a disproportionate share of the global malaria burden. In 2015, about 90% of malaria cases and 92% of malaria deaths occurred in this region [3]. The WHO sub-Saharan region is the most affected with over 85%, and where children under 5 years of age pay the highest burden with over 67% of deaths. In this region, a child dies of malaria every two minutes [5]. In 2020, there will be an estimated 241 million cases of malaria worldwide, with 627,000 deaths; the WHO African Region bears a disproportionately large share of the global malaria burden, accounting for 95% of malaria cases and 96% of malaria deaths. Children under 5 years of age accounted for 80% of all malaria deaths in the region [5]. In Cameroon, malaria is responsible for 23% of hospital admissions and consumes an average of 40% of household health budgets. The fight against malaria remains a priority for many African countries. It is mainly focused on early diagnosis and rapid management of infections with artemisinin-based combination therapies, prophylaxis in pregnant women with sulfadoxine-pyrimethamine and integrated vector control with a massive impregnated mosquito net component based on intra-domiciliary spraying and distribution [6]. According to the 2017 annual report of the NMCP in Cameroon, hospital morbidity due to malaria in the under 5 age group has seen a greater reduction (30.56%), but it remains a concern. It fell from 45.8% in 2011 to 31.8% in 2017 (figure 4). This reduction can be attributed to all the actions undertaken by the government and its partners in favour of this vulnerable group (free treatment of simple and severe malaria respectively since February 2011 and May 2014, free distribution of LLINs to children under 5 years of age since 2005, chemoprevention campaign for seasonal malaria in children aged 3 to 59 months in the Far North and North Regions) [7].

Some studies carried out in Cameroon on malaria in certain health facilities focus on other aspects related to knowledge, attitudes and practices, but little data is available on the health care offer of free malaria treatment in children aged less than five years. Thus, updated information on the health care offer of free malaria treatment for children aged less than 5 years in health facilities are needed to assess the implementation of this malaria control strategy. The functioning of the national malaria control programme needs evidence to ensure access to free treatment for children aged less than five years who need it throughout Cameroon. Due to the specificities of the regions and the fact that the results currently available are quite limited in the evaluation of the health care offer of free malaria treatment in children aged less than five years, we believe it is necessary to evaluate the health care offer of this treatment in order to determine the intervention needs for the overall improvement of the latter in the health facilities of the Dschang Health District.

This study is a contribution to the improvement of the health care offer of free malaria treatment among under five children in health facilities in the Dschang Health District by producing evidence for a baseline evaluation to improve the intervention strategy. It aims to describe the health care offer of free malaria treatment among under five children in the DHD. The results of this study will be disseminated to the relevant authorities so that they can be used to take the necessary actions.

2. Method and materials

2.1. Study design and setting

We carried out a descriptive cross-sectional study, targeting all HF (Health facilities) in the Dschang Health District (DHD). Information shall be collected from health personnel in these different HF with the help of a semi-structured questionnaire, in order to assess the HF offering free malaria treatment among under five children in the DHD. The study ran from November 2022 to July 2023

2.2. Selection criteria

Table 1 Selection criteria

N°	Targets	Eligibility criteria	Inclusion criteria	Exclusion criteria
1	Health facilities	Public or private health facility	Being an operational health facility of the Dschang health district	Health facilities refusing to participate or not operational Health facilities not treating under five children
2	Service	Must be a health service in the health facility	Should be one of the services below; paediatrics, emergency, consultation.	Service other than those cited
3	Personnel	Must be personnel of the health facility	Health personnel in charge of under five children	Students or health personnel on internship in those services Health personnel not willing to participate

2.3. Sampling method and sample size

2.3.1. Sampling technique of the study population

The participants would be selected at two levels:

First level: The health facilities

At this level we carried out an exhaustive sampling method which included all the ninety-one health facilities in the Dschang health district.

Second Level: selection of participants

In the health facilities selected we recruited at least a paediatrician, nurse, doctor, care giver or any health personnel working in the follow up of children less than five years.

2.3.2. Sample size

Table 2 Number of participants per target

N°	Target	Number
1	Health District	1
2	Health areas	22
3	Annex regional hospitals	1
4	District medical centres	4
5	Integrated health centres	27
6	Health facilities private	59
7	District head	1
8	Health personnel	91

2.4. Study Implementation

2.4.1. Process of Data Collection

Data was procured through interviews with health personnel, using a semi-structured questionnaire. The instrument utilized for this endeavour was a data collection sheet designed to align with the specific objectives at hand.

2.4.2. Data quality control

To ensure data quality, the data collection tools were pre-tested before the actual data collection was conducted and necessary corrections were made after the pre-test. The collected data was reviewed for completeness, accuracy, and clarity by the principal investigator.

2.4.3. Data analysis

The collected data was entered into kobo toolbox, then exported to Microsoft Excel 2013 spreadsheets to check for data uniformity. Subsequently, the data was further exported to SPSS 25 for analysis. ArcGIS was utilized to create the map. The results were presented as frequencies, proportions, and percentages for qualitative variables, while quantitative variables were expressed as means and their standard deviations.

2.5. Ethical considerations and Administrative authorisations

Administrative authorisation was sought from the authorities of the Dschang health district in addition to an approval from the west region Ethics Committee (Nº/230/29/03/2023/CE/CRERSH-OU/VP) before the study was carried out.

2.6. Operational Definitions

- **Poor Knowledge**: knowledge was considered poor when the score of the knowledge questions were less than 6 of the 10 item scale knowledge questions.
- **Good knowledge**: knowledge was considered good when the score of the knowledge questions were > 6 of the total knowledge questions.

3. Results

3.1. Sociodemographic characteristics

3.1.1. Sociodemographic characteristics of health area

Out of the 22 health areas targeted, all 22 were evaluated. Among the 91 HF, 88 participated in our study, resulting in a participation rate of 96.7%. Two HF in the Fiala Foreke health area, namely the university health centre and the prison hospital which were excluded from the study because they do not provide treatment for children under five. Additionally, one HF, the CS of Minka Baleveng, was initially questioned but later excluded. This led to an exclusion rate of 3.3%, as indicated in Table 4 below.

Table 3 Distribution of health facilities visited per health areas

Health area	Number of HF	Number of HF targeted	Number of HF attend (%)
Baleveng	**9**	8	88.9
Balevoni	1	1	100.0
Doumbouo	5	5	100.0
Fiala foreke	14	12	85.7
Fokoue	3	3	100.0
Fometa	9	9	100.0
Fomopea	2	2	100.0
Fonakeukeu	2	2	100.0
Fondonera	2	2	100.0
Fongo-Ndeng	3	3	100.0
Fontsa-touala	2	2	100.0
Fotetsa	1	1	100.0
Latchouet	2	2	100.0

Lepoh	3	3	100.0
Lingang-foto	1	1	100.0
Maka	3	3	100.0
Mbeng	10	10	100.0
Mboua	4	4	100.0
Mekouale	4	4	100.0
Ndoh-djutsitsa	5	5	100.0
Nkeuli	1	1	100.0
Siteu	5	5	100.0
Total: 22	91	88	96.7

3.1.2. Socio demographic characteristics of health personnel and health facilities in relation to malaria treatment

In our study, 72.7% of the participants among health personnel were females while 93.2% of them were aged over 25. Additionally, 63.6% of the participating health personnel had a high level of education, 36.4% were state nurses, and 77.3% had less than 5 years of working experience.

Among the 88 HF investigated, only 28.4% were situated in the semi-urban areas, and 45.4% were public HF. Category 6 HF were predominantly represented in our study, with a total percentage of 93.2% belonging to this category. Furthermore, 20 out of 21 (95.2%) of the HF offering free malaria treatment were also classified as category 6, as illustrated in table 5 below:

Table 4 Distribution of Socio demographic characteristics of health personnel and health facilities in relation to malaria treatment

Variable	**Frequency**	**(%)**
Sex		
Male	25	28.5
Female	63	71.5
Age range		
18 – 21 years	1	1.1
21 – 25 years	5	5.7
> 25 years	82	93.2
Level of education		
None	1	1.1
Primary	1	1.1
Secondary	32	36.3
Higher education	54	61.4
Qualification		
Caregivers	15	17.0
Midwife	2	2.3
Lab technician	5	5.7
State nurse	32	36.4
Senior nurse	23	26.1
Doctor	11	12.5

Number of years in service		
< 5 years	68	77.3
6 – 10 years	9	10.2
11 – 15 years	6	6.8
> 15 years	5	5.7
Health personnel		
Medical doctor	10	13.7
State nurse	25	34.2
Senior nurse	19	26.0
Lab technician	5	6.8
Midwife	2	2.7
Caregivers	12	16.4
Location of HF		
Semi-urban	25	28.1
Rural	64	71.9
TYPE OF HF		
Public	40	44.9
Private lucrative	49	55.1
Category of HF		
4th	3	3.4
5th	3	3.4
6th	82	93.2

3.2. Mapping of the offer of free malaria treatment among under five children in the Dschang health district 2023

Figure 1 illustrates the geographical distribution of HF offering free malaria treatment among under-five children in the Dschang health district in 2023. Notably, 9 out of the 22 health areas have health facilities that provide this service. Specifically, the health areas of Maka, Fontsa-Touala, and Fonakeukeu all have all their HF offering free malaria treatment for under-five children. In 2023, out of the 88 HF in the Dschang health district, only 21 offer free or subsidized malaria treatment to under five children, as depicted in the figure below:

3.3. Estimation on the needs in terms of malaria treatment subventions for free malaria treatment offer among under five years children

3.3.1. Distribution human resources and drug subventions

According to this study, all health facilities had at least one health personnel in charge of malaria treatment in under five children. However, 40.9% of these HF reported a need for additional health personnel. Few HF reported receiving free malaria treatment drugs for under-five children (29.5%), with 18 (72.0%) of them frequently receiving drugs as needed, 21 (84.0) having sufficient quantities of drugs for all the under-five children visiting, and 22 (88.0) had drugs in good state, as indicated in Table 6 below.

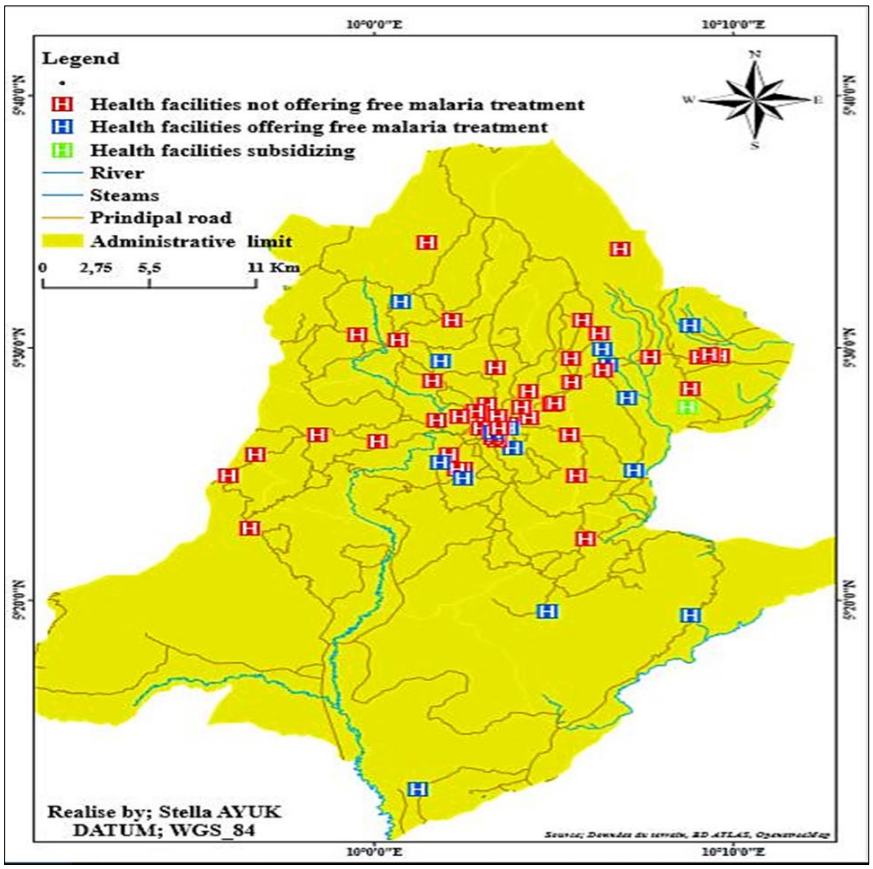

Figure 1 Distribution of health facilities that offer, not offer and subsidize free malaria treatment in the Dschang health district 2023

Table 5 Distribution of human resources for free malaria treatment

Human resources		**Effective**	**Percentage**
Number HF who said they needed health personnel in charge of under five years children		36	40.9
Drug subventions		Effective	Percentage
HF that received drugs for free malaria treatment in under five children		26	29.5
How often HF receive drugs	Weekly	1	4.0
	Monthly	2	8.0
	Yearly	4	16.0
	On command	18	72.0
Number of HF who had sufficient quantity of drug		21	84.0
Number of HF who had drugs in good state		22	84.7

3.3.2. Distribution in terms case management guide lines and materials

At the end of our investigation, it was discovered that 95.5% HF were aware of and adhered to the procedures for providing free malaria treatment for under-five children. However, 81.8% of these facilities did not have all the materials and necessities, and 86.3% reported a shortage of malaria inputs, as detailed in Table 7 below.

Table 6 Distribution in terms of case management guide lines and materials for free malaria treatment offer among under five children

Case management guide lines and materials		Effective	Percentage
Do you know about the procedures for offering free malaria treatment for under five children	Yes	84	95.5
	No	4	4.5
Do you respect these procedures?	Yes	85	96.5
	No	3	3.4
Do you have all the materials and necessities needed to offer free malaria treatment to under five children	Yes	16	18.2
	No	72	81.8
List those you do not have	Insufficient medicine	5	6.8
	No subvention	63	86.3
	No tests	4	5.5

3.4. Assess the knowledge levels of health personnel in hospitals offering and not offering free treatment against malaria for children under five years in the Dschang health district

The investigation reported that all the health personnel that participated knew malaria is caused by the female anopheles' mosquito, 88 (100.0%) and 87 (98.9%) were aware of malaria signs and symptoms as well as the 3 main lines of treatment for malaria. Most health personnel did not know when the free malaria policy was instituted in Cameroon for both simple and complicated with 78 (88.6%) who did not know for simple malaria and 75 (85.2%) who did not know for complicated malaria; as shown in table 8 below and figure 5 below.

Table 7 Assess the knowledge levels of health personnel in hospitals offering and not offering free treatment against malaria for children under five years in the Dschang health district

Variables		Effective (n)	Percentage (%)
Do you know about the free malaria treatment policy for children under five years?	Correct answer	83	94.3
	Wrong answer	5	5.7
In what year was the free malaria treatment policy for simple malaria implemented in Cameroon	Correct answer	10	11.4
	Wrong answer	78	88.6
In what year was the free malaria treatment policy for complicated malaria implemented in Cameroon	Correct answer	13	14.8
	Wrong answer	75	85.2
The malaria disease is caused by a parasite?	Correct answer	85	96.6
	Wrong answer	3	3.4
Malaria is spread by the female anopheles' mosquito	Correct answer	88	100.0
	Wrong answer	0	0.0
Some signs and symptoms of malaria include fever, sweat, chills, headaches, muscle aches, nausea and vomiting	Correct answer	87	98.9
	Wrong answer	1	1.1
What are the 3 lines of malaria treatments in children less than 5 years	Correct answer	87	98.9
	Wrong answer	1	1.1
If you do not have a lab (to make a blood slide) you can use an RDT to test for malaria	Correct answer	87	98.9
	Wrong answer	1	1.1
	Correct answer	82	93.1

It is possible for an under five child who is healthy and active with no symptoms of malaria to have malaria parasites in their body	Wrong answer	6	6.8
Malaria can be prevented in under five children by use of protective clothing, bed nets, repellents and insecticide, uptake of Fancidand (sulphadoxine pyrimethadine)	Correct answer	88	100.0
	Wrong answer	0	0.0

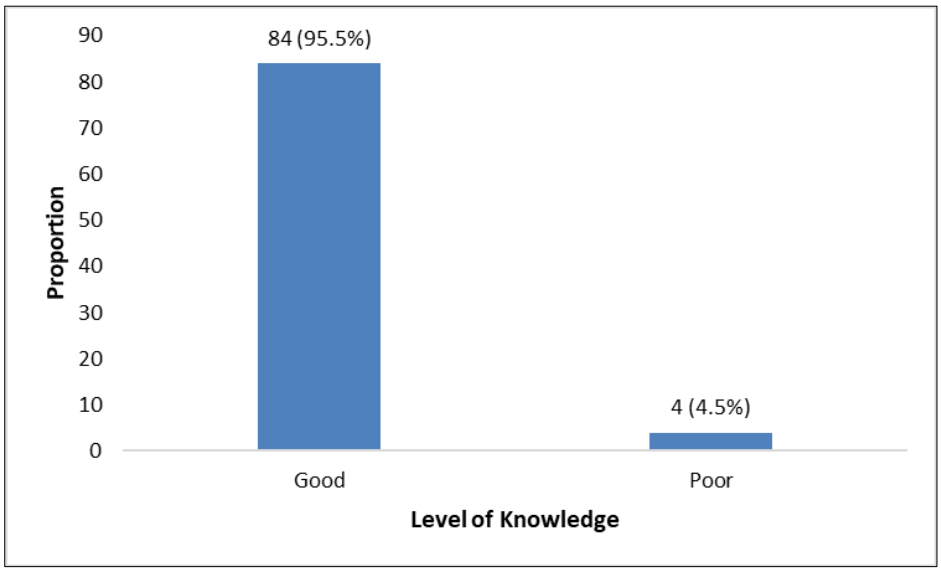

Figure 2 Distribution of score on knowledge of health personnel on the free malaria treatment in children less than five

3.5. Barriers to providing free malaria treatment by health facilities to children under five years in the Dschang health district

3.5.1. Health facilities that offer free malaria treatment

Out of the 88 HF, 12 (14.0%) offered free malaria treatment for both simple and complicated malaria, 9 (10%) offered only for complicated malaria and 67 (76.0%) do not offer any free treatment.

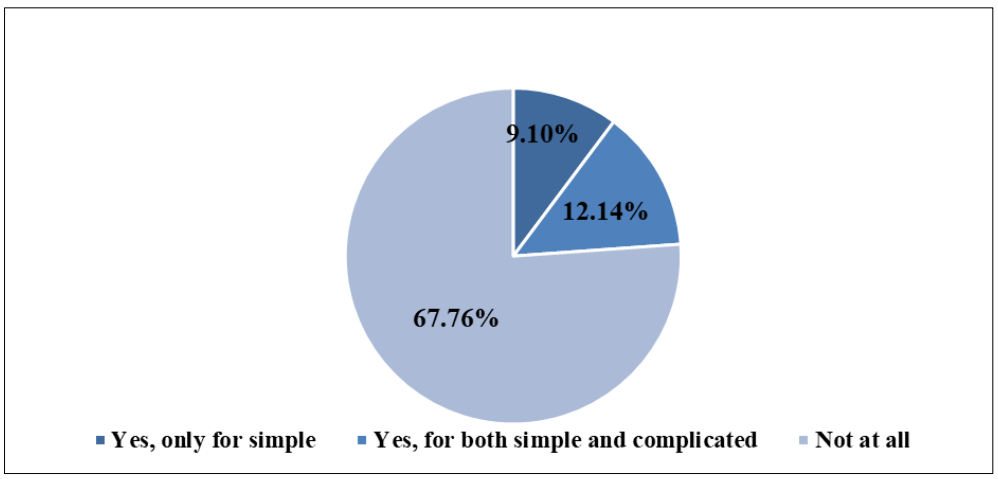

Figure 3 Distribution of health facilities that offer free malaria treatment

3.5.2. Strategy used in informing health care receivers about free malaria treatment for under five children

Only 20 out of the 21 health facilities offering free malaria treatment used a strategy to inform mothers and guardians of under five children about free malaria treatment. The main strategy used was informing them during drug

prescription with 13 of the 21 (61.9%) who used this strategy, 1(4.8%) used the strategy of informing them during drug purchase, 5 (23.8%) passed the information during home visits to care receivers and 2 used flyers and posters to inform the health care receivers about the free malaria treatment policy for under five children as seen in table 11 below.

Table 8 Distribution of strategy use in informing health care receivers

Variable	Frequency(n=20)	%
Informing them during drug prescription	13	61.9
Informing them during purchasing drugs	1	4.8
Passing the information during home visits	5	23.8
Use of flyers and posters	2	9.5

3.5.3. Obstacle faced by HF in offering free malaria treatment

It was reported that all health facilities 88 (100.0%) knew the free malaria treatment policy for under five children can affect malaria prevalence in the Dschang health district due to increase consultations and treatment.

The main obstacle reported after investigation was the lack of subvention from the government, it was reported by 71 (80.7%) HF.

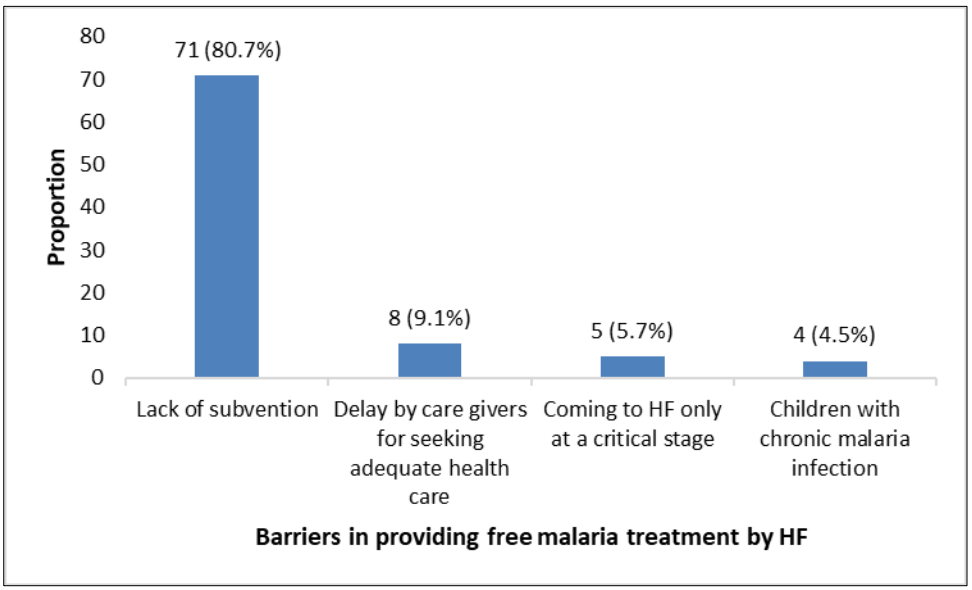

Figure 4 Distribution of barriers in providing free malaria treatment by HF

4. Discussion

The primary objective of our study was to assess the health care offer of free malaria treatment among under five children in health facilities of the Dschang health district in 2023. Among the 88 consulting health personnel interviewed, 64 (71.9%) were females and 25 (28.1) were males with 82 aged greater than 25 years. Our findings differ from a study conducted by *Vukugah et al* in 2015 in the Bamenda health district, where 54% of the consulting health personnel were of the female gender and most were over 43 years of age [8]. Our findings differ from a study conducted by *Wam et al* in 2021 in the Ndop health district, where 52.4% of the consulting health personnel were males, with the majority being over 32 years of age [9].

Regarding the availability of qualified health personnel, our study revealed that 36.4% of the consulting health personnel were state registered nurses, which aligns with findings in a study by *Vukugah et al* in 2015 in the Bamenda health district, where 45% of consulting health personnel were state registered nurses [8]. Our results also resemble those of *Wam et al* in 2021 carried out in the Ndop health district, where the majority (33%) of the consulting health personnel were state registered nurses [9].

Our study has revealed that only 21 (23.6%) HF provided free malaria treatment for either simple or complicated malaria, with 9 (10.0%) for only simple and 12 (14.0%) for both simple and complicated malaria treatment our results are less than those of the study conducted by *Nkwenti et al, 2019* in Buea health district of Cameroon's south-western region which unveiled that 10 out of the 11 health facilities, accounting for 90.9%, provided complimentary treatment for malaria [10], which starkly contrasts with our own research findings. This discrepancy may be attributed to their sampling method and sample size, which were relatively small and may have included a significant proportion of the health facilities that provide free malaria treatment as compared to our own study, which included all health facilities in the Dschang health district our results are also slightly lower than those of the NMCP, 2021 in which for a study carried out in 13 districts in the North and Far North regions of Cameroon revealed that case management of uncomplicated and complicated malaria in children under five was free only in 39% HF [11]. This could be due to the fact that our research was carried out only in one health district whereas the other study was done in 13 health districts.

It is worth noting that 15 (71.4%) HF in our study were affiliated with the public sector, whereas only 6 (28.6%) HF were affiliated with the private sector. The outcomes obtained are in line with the pronouncement made by MINSANTE, 2014 which stated that comprehensive healthcare plan can be implemented in healthcare institutions as part of the universal healthcare coverage [8], indicating that both public and private health facilities are mandated to provide malaria treatment free of charge for under five children.

Our research study showed that 83 (94.3%) HF had personnel aware of the free malaria policy for under five children and 275 (93.9%) parents were aware of this policy and children received the treatment. Our results are not in line with the study conducted by *Wam, EC et al, 2021* in Ndop health district situated in the north-west region of Cameroon which reported that despite the awareness of the free malaria policy among all health personnel and 41% of parents, no child had the privilege of benefiting from the free treatment [9] this may be due to the fact that the Ndop health district had a smaller sample size for both health personnel and parents compared to ours and parents questioned didn't have children receiving free malaria treatment or it might be also attributed to total absence of subvention by the government to the Ndop district. Since, only 21 health facilities had sufficient quantities of the medication for all children under five. 84 (95.5), knew of the protocol for providing free malaria treatment for children aged less than five; however, only 16 (18.2%), possessed all the necessary materials essential for the provision of free malaria treatment. This may be the principal reason why most health facilities do not offer free malaria treatment for children under five years. Similar results were reported by *Sielenou et al,* 2015 and *Ridde V et al,* 2009 in the Adamawa region [12] and Burkina Faso [13] respectively where free malaria treatment has never been free for the users; they continue to pay, but significantly less than before the policy.

The awareness level show that, of those individuals who responded to the survey, health care providers constituted 15 (17.0%), midwives constituted 2 (2.3%), lab technicians constituted 5 (5.7%), state nurses constituted 32 (36.4%), senior nurses constituted 23(26.1%), and medical physicians constituted 11 (12.5%) and 84 (95.5 %) of these health personnel demonstrated good knowledge of the pertinent details related to the policy of free malaria treatment. These findings are in line with those of the study conducted by *Nkwenti et al*, 2019 in which the outcomes were observed in the Buea health area, where 72.7% of respondents appraised their knowledge of the free malaria policy as being exceptional [10]. Also, it has been observed that a significant proportion of health facilities, specifically 13 (61.9%), which offer free treatment for malaria, utilize the method of medicine prescriptions as their primary approach for disseminating pertinent information to the care receivers. These outcomes were found to be relatively similar to those witnessed in the Buea Health District by *Nkwenti et al*, 2019 where notifying care receivers during the prescription process was the primary strategy employed by 4 (36.4%) facilities [10]. All of the healthcare facilities unanimously agreed that providing free malaria treatment could potentially and hopefully result in the lowering of the incidence of the disease in the Dschang health district, mostly due to the plausible, increase in consultation and treatment. Studies that have been conducted in Cameroon by *Nkwenti et al*, 2019 and *Sielenou et al*, 2015 have evidently and demonstrated how the availability of free malaria treatment has positively impacted the incidence of the disease in such communities [10, 14]. Conversely, a study conducted by *Ouédraogo et al, 2020* in Burkina Faso unveiled that a high prevalence of malaria which was attributed to the rise in malaria incidence following the policy rollout to an increased use of health services combined with an increased availability of rapid tests and a higher compliance to the 'test and treat' policy [15]. In the research conducted, it was discovered that a staggering 71/89 (80.7%), have identified the non-existence of subvention from the government as the most significant obstacle to their operations. Similarly, in their ability to deliver quality healthcare services to the public, thus posing a severe challenge to the healthcare sector. This was also in line, a study conducted by *Nkwenti et al*, 2019 in the health district of Buea indicates that a substantial 60% of health facilities face a daunting obstacle in the form of the lack of subventions. This predicament, while labelled as a mild constraint, still poses a significant challenge to the healthcare facilities in question and impedes their ability to deliver quality healthcare services to the public [10].

4.1. Difficulties faced

During the course of this study, we encountered several difficulties such as:

- Difficulties related to the access of some health facilities and getting their geographical coordinates: Since the DHD is mostly made up of rural health areas access to some health facilities was really difficult especially on rainy days due to bad and slippery roads that made the areas inaccessible and delayed data collection process. Also, some areas had no network making it impossible to get the health facilities geographical coordinates of some health facilities hence the map couldn't show all the health facilities.

4.2. Strength of the study

- The health personnel though busy had time to answer the questionnaire.
- An exhaustive study was done hence all the health facilities were included in the study giving a good representation of the DHD.

4.3. Limitations of the study

- Information bias: Though the anonymity was ensured, the accuracy of the response provided by participants cannot be guaranteed since the offer of free malaria treatment is a sensitive issue.
- Selection bias: Since convenience sampling was used to select participants of mothers, the sample may not be representative of the health facility.

5. Conclusion

At the end of our research work which had as main objective to describe the health care offer of free malaria treatment among under five children in the DHD we were able to draw the following conclusions;

- Out of the 22 health areas in the DHD only 9 (40.9%) health areas had health facilities that offered or subsidized free malaria treatment for under five children.
- Of the 88 HF investigated, 1 being non-operational and 2 others didn't treat under five children, only 21 (23.9%) health facilities offered or subsidized free malaria treatment to under five children in the DHD.
- Out of the 21 HF offering free malaria treatment for under five children in the DHD, 12 (14.0%) offered free malaria treatment for both simple and complicated malaria and 9 (10%) offered only for simple malaria.
- Of the 21 HFs offering, 15 were public health facilities and 6 were private and 20 out of the 21 offering were category 6 health facilities.
- A low level of sensitization (22.7%) on the free malaria treatment policy was noticed in the DHD because out of the 88 HF investigated, only 20 out of the 21 offering actually used a strategy to inform mothers and guardians about this policy.
- It was also noticed that the knowledge level of the health personnel about the case management procedures of offering free malaria treatment to under five children were good because 84 HF knew the procedures from the testing to drug administration and 85 HF respected these procedures to offering free malaria treatment to under five children.
- Also, the main barrier faced by health facilities in the DHD to offering free malaria treatment to under five children was absence or lack of government subvention as reported by 71 (80.7%) HF.

All the health personnel agreed with the fact that offering free malaria treatment to under five children would help reduce the prevalence of malaria in the DHD by increase in consultations and treatment. Hoping with the coming of the health programme "Health For All", all the public and private health facilities in the DHD would be able to have necessary subvention to offer free malaria treatment to under five children.

Recommendation

- Recommendations to the Dschang health District.
  - The regional delegation of public health should provide both the public and private health facilities in the DHD with general information and assistance towards patient care related to malaria.
  - They should also put in place a monitoring an evaluation system to make sure all the health facilities that receive the subventions effectively offer free malaria treatment to under five children that come to their health facility for treatment.
- Recommendations for health personnel

- Health personnel should sensitize mothers or guardians with children less than five years about the free malaria policy so that they should be aware about it and bring their children to the hospital for testing and treatment during illness.
- Commands for the free treatment should be done every time need be for those who receive on command.

- Recommendations to the Mothers, guardians and tutors
  - Mothers should avoid auto medication without consultation and testing of their children first.
  - Mothers should avoid bringing their children especially under five children to the health facilities only when the situation is critical.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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