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ANALYSIS OF THE ACCEPTABILITY OF THE MALARIA VACCINE RTS, S/AS01 AMONG PARENTS OF CHILDREN AGED 0-5 YEARS IN HOSPITAL FACILITIES IN DOUALA, CAMEROON

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ABSTRACT

Introduction: Malaria remains a major public health problem, with 249 million cases recorded worldwide, 94% of them in Africa. In Cameroon, more than 3.3 million cases were confirmed in 2023. Despite prevention efforts, the incidence among children under 5 remains high. The RTS, S /AS01 malaria vaccine, recently introduced in the country, aims to reduce morbidity and mortality. **Methods:** A cross-sectional study was conducted from January to June 2024 in three hospitals in Douala. Parents of children aged 0-5 years attending pediatric and immunization services were included. Sociodemographic data, knowledge of malaria and vaccination, and factors influencing vaccine acceptability were analyzed using SPSS version 2.6 software. **Results:** Of 397 participants, 56.2% agreed to vaccinate their children against malaria, 27% refused and 16.9% were undecided. Fear of side effects (75%) and lack of trust in laboratories (12.1%) were the main obstacles. Factors favoring acceptability included confidence in vaccine efficacy (OR = 8.14, p = 0.004) and in health authorities (OR = 8.00, p < 0.001). **Conclusion:** Vaccine acceptability is moderate. Targeted awareness-raising and education campaigns are essential to reinforce information about the vaccine and increase its uptake within communities.

KEYWORDS: malaria, RTS, S/AS01 vaccine, acceptability, and children aged 0-5 years, low immunization, Cameroon.

INTRODUCTION

Malaria remains an infectious disease of major public health importance, affecting 249 million people worldwide, with 94% of cases occurring in sub-Saharan Africa.[1] In Cameroon, more than 3,382,676 confirmed cases were reported in 2023, reflecting the persistence of this endemic despite the preventive strategies put in place[3] Current prevention approaches rely mainly on chemoprevention targeting children and pregnant women, as well as vector control interventions.[4] In order to reduce the morbidity and mortality associated with malaria, the RTS, S/AS01 vaccine has recently been integrated into Cameroon's public health programme. Although various preventive methods have been deployed, the incidence of the disease continues to rise, particularly among children under the age of 5, a particularly vulnerable population.[3] In recent years, there has been growing interest in vaccination as a complementary means of controlling malaria. A preliminary evaluation carried out 24 months after the introduction of the RTS, S/AS01 vaccine showed a 30% reduction in hospital admissions due to severe forms of malaria in the pilot areas.[6] In 2021, this vaccine was recommended by the World Health Organization (WHO) for use in areas of moderate to high transmission, particularly in sub-Saharan Africa, as a complement to existing interventions[7] In January 2024, Cameroon included the RTS,S/AS01 vaccine in the national schedule of the Expanded Programmed on Immunization, following the success of the pilot phases carried out in Kenya, Ghana and Malawi, where vaccination led to a 13% reduction in deaths among eligible children.[8,9] However, the effectiveness of this

initiative largely depends on the acceptability and uptake of the vaccine by the target populations.

This study aims to assess the acceptability of the malaria vaccine in Cameroon in order to provide strategic guidance to the vaccination programme and promote optimal uptake within communities.

MATERIALS AND METHODS

Type of study: This research is part of a cross-sectional, descriptive and analytical study.

Study period: The study was conducted over a period from January 10 to June 5, 2024.

Study location: The study was conducted in the pediatric wards and vaccination centers of three hospitals in Douala: Laquintinie Hospital, District hospital the Deido and District Medical Center the Cité-Sic. These establishments were selected for their high level of immunization attendance, and their representativeness of the local socio-economic, demographic and cultural contexts.

Study population: The study sample consisted of parents or guardians of children under five years of age residing in the city of Douala.

Inclusion criteria: Parents or guardians with at least one child under 5 years of age attending the pediatric wards and vaccination centers of the hospitals involved in the study constituted the target population.

Exclusion criteria: Parents or guardians of children under 5 who refused to participate in the study were excluded from the sample.

Sampling: We used a simple random sampling method to select participants for our study. The selection base consisted of parents or guardians of children under 5 years of age attending the pediatric wards and immunization centers of the selected hospitals. The sampling method was unrewarded, ensuring that a selected participant could not be selected again, thus ensuring the uniqueness of the participants and avoiding bias due to duplication in the sample.

Each parent or guardian had an equal probability of being selected to participate in the study. The sample size was determined using Lorentz's formula: $N = Z^2 \frac{P(1-P)}{e^2}$

N= Sample size

Z= 95% confidence interval with α=0.05.

Therefore Z= 1.96.

P= Prevalence of malaria vaccine acceptability in 2023 in Bangladesh (p=70%)[48]

e= Threshold of error at 5%.

Substitute the values in the formula: $N = 1.96^2 \frac{0.7(1-0.7)}{0.05^2} = 322$

The minimum sample size required was therefore 322 participants.

MATERIALS

To carry out our study, we needed the following.

Academic material: Books, articles, theses and journals to support the theoretical research and establish the frame of reference.

Computer hardware: Computers for data entry and processing, USB and Internet keys for data storage and transfer, and software for data analysis.

Human resources: Supervisors to oversee the work, as well as health facility staff involved in data collection and administration.

Collection materials: Survey sheets for conducting quantitative surveys, notepads and pens for note-taking and tracking information in the field.

Ethical considerations: Ethical clearance authorizations were obtained from the institutional ethics committee of the Faculty of Medicine and Pharmaceutical Sciences of the University of Douala (N°056/UD/FMSP/VDR/mac). Research authorizations were issued by the Director of Laquintinie Hospital (N°360/AR/MINSANTE/DHL) and by the Regional Delegate for Public Health from Littoral (N°0358/AR/MINSANTE/DRSPL).

Data collection: After distributing an information sheet clearly explaining the aims of the study, the questionnaire was administered in French or English, according to the preference of the participants who agreed to take part. The interviews were conducted either by myself, or by the health staff of the health facilities concerned, whom I had trained for the task. Data were collected using survey forms containing a pre-tested questionnaire on five randomly selected parents. The information collected included socio-demographic data such as age, gender, educational level, economic income, marital status, occupation, number of children under five, place of residence, religion and relationship to the child. Data on knowledge of malaria were also collected, including understanding of its modes of transmission, its main symptoms, prevention methods such as the use of impregnated mosquito nets, and participants' previous experience with the disease. With regard to malaria vaccine acceptability, questions were asked about attitudes towards Expanded Program on Immunization (EPI) vaccines in general, perceived importance of vaccination in disease prevention, specific knowledge about the malaria vaccine, willingness to have their child vaccinated against malaria, and concerns or fears about the vaccine. Participants were also asked about their sources of information about malaria and the vaccine, and their confidence in this information. Finally, factors influencing vaccine acceptability were explored. These factors included intention to vaccinate, perception of

vaccine efficacy and safety, fears about potential side effects, and the influence of cultural or religious beliefs on vaccination. Acceptability of the malaria vaccine was defined as the study's dependent variable, while socio-demographic and economic characteristics, and participants' level of knowledge, attitudes and practices were defined as independent variables.

Statistical analysis: Microsoft Excel was used to record and code the data, while SPSS version 26 was used for data analysis. Data were presented in descriptive form using tables, figures, numbers and percentages. Quantitative data were analyzed using position (mean, median) and dispersion (standard deviation) parameters, while qualitative data were expressed as absolute and relative frequencies. Associations between the independent variables and the dependent variable (acceptability of the malaria vaccine) were explored using the Chi-square test and Fisher's exact test. The odds ratio (OR) and its 95% confidence interval were calculated where necessary. In the multivariate analysis, variables significantly associated with vaccine acceptability were included in a logistic regression model. The adjusted p-value, the adjusted OR and its 95% confidence interval were also calculated. The significance threshold for statistical tests was set at $p < 0.05$.

RESULTS AND DISCUSSION

Socio-demographic characteristics

Gender distribution: Women made up 76.3% of participants, with a sex ratio of 3.1.

Table I: Breakdown of study population by gender.

Variables	Number (n)	Percentage %
Gender		
Female	303	76,3
Male	94	23,7
Total	397	100

Age distribution: The mean age of participants was 29 ± 5.8 years and the median was 29 years, IQR [18.0 - 49.0] (Table II).

Table II: Age distribution of the population.

Age analysis	Total (N = 397)	Female (N = 303)	Male (N = 94)	P-value
Mean age ± SD (years)	29,2 ± 5.2	29 ± 6	29.7 ± 5.5	0.2
Mean age ± SD (years)	29	28	29	
Mean age ± SD (years)	[18 - 49]	[18 - 49]	[19 - 43]	

Table III: Socio-demographic and cultural characteristics of the study population.

Parameters	Total (N = 397)		Fémale (N = 303)		Male (N = 94)		P-value
	N	%	n	%	n	%	
Number of children							**0.6**
[0 -2]	199	50	149	49	50	53	
[2 – 5]	149	38	114	38	35	37	
> 5	49	12	40	12	9	9.3	
Matrimonial status							**0.4**
cohabitation	132	33	105	35	27	29	
married	126	32	99	33	27	29	
single	124	31	87	29	37	39	
divorced	11	2.8	8	2.6	3	3.2	
widowed	3	0.8	3	1	0	0	
Religion							**0.074**
Muslim	140	35	105	35	35	37	
Catholic	133	34	99	33	34	36	
Protestant	119	30	97	32	22	23	
other	3	0.8	1	0.3	2	2.1	
none	1	0.3	0	0	1	1.1	
Level of education							**0.052**
higher	257	65	205	68	52	55	
secondary	113	29	76	25	37	39	
primary	25	6.3	20	6.6	5	5.3	
No education	1	0.3	1	0.3	0	0	
Professional status							**0.041**
Teacher	137	35	106	35	31	33	
Entrepreneur	96	24	73	24	23	24	

Shopkeeper	90	23	70	23	20	21	
Civil servant	55	14	43	14	12	13	
Student	6	1.5	3	1	3	3.2	
Other	4	1	3	1	1	1.1	
Health worker	4	1	4	1.3	0	0	
Unemployed	4	1	0	0	4.3	4.3	
Monthly income (FCFA)							**0.9**
[0 - 50.000]	137	35	104	34	33	35	
[51000 – 100000]	119	30	90	30	29	31	
[101000 - 150000	92	23	69	23	23	24	
[151000 -250000]	48	12	39	13	9	9.6	

Population distribution by marital status: According to marital status, the data from our study show that 132 participants (33.6%) were cohabiting and 126 participants (32.1%) were married.

Distribution by religion: In our study, 172 parents or guardians (43%) were Catholic, followed by Protestants (35%) and Muslims (21%). A further 1% of the population belonged to another religion, including traditional beliefs.

Distribution by level of education: More than two-thirds of participants, 257 (64.7%), had a higher level of education, while 113 participants (28.5%) had a secondary level of education.

Population distribution by occupation: Table III shows that 137 (34.5%) of the study participants were shopkeepers.

Population distribution by economic income: In our study, 137 participants (34.5%) reported a monthly income of between 0 and 50.000 CFA francs, while 119 participants (30.0%) had a monthly income of between 101.000 and 150,000 CFA francs.

MALARIA AND VACCINATION

Knowledge of malaria transmission: The main mode of malaria transmission known to participants was mosquito bites (395 participants, or 99.5%). In addition, 339 participants (85.4%) identified fever as the main symptom of malaria, followed by a syndrome combining fever, headache, chills and muscle pain, reported by 30.6% of participants.

Table IV: Participants' Knowledge of Malaria Transmission and Symptoms.

Variable	Number (N)	Percentage (%)
Transmission mode		
Polluted water	1	0,3
Mosquito bites	395	**99.5**
Don't know	1	0.3
Knowledge of symptoms		
Fever	339	**85.4**
Fever, headache, chills, muscle pain	36	30.6
Fever, headache, chills, muscle pain, vomiting	3	1.01
Fever, headache, abdominal pain	11	2.8
Fever, headache, abdominal pain, vomiting	4	1.01

Distribution of participants according to their child's vaccination status: Our study revealed that 389 children (98.2%) of study participants had an up-to-date vaccination schedule (Figure 1).

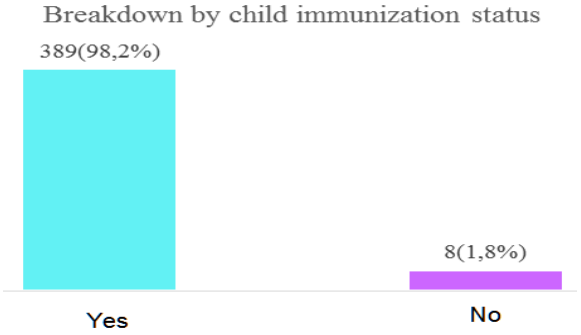

Fig. 1: Distribution of participants according to their child's vaccination statuts.

Distribution of the population according to level of confidence in vaccine efficacy and vaccine hesitancy: Our study showed that 325 participants (81.8%) were very confident in the efficacy of vaccines, and 364 participants (91.7%) had no hesitation in having their children vaccinated. Of the 33 participants (8.3%) who expressed vaccine hesitancy, 30 (99.2%) justified it by fear of adverse effects (Table V).

Table V: Description of the level of confidence in vaccine efficacy and vaccine hesitancy in general.

Variables	Number (N)	Percentage (%)
Level of confidence		
Not at all confident	43	10.8
Very little confidence	29	7.2
Very confident	325	**81.8**
Vaccination hesitancy at EPI		
YES	33	8.3
NO	364	**91.7**
If so, why?		
No confidence	3	0.8
Fear of side effects	30	**99.2**

Prevalence, level of knowledge and understanding of malaria vaccine: Distribution of the population according to awareness of the malaria vaccine in our study, 350 participants (88.2%) were aware of the malaria vaccine (Fig 2).

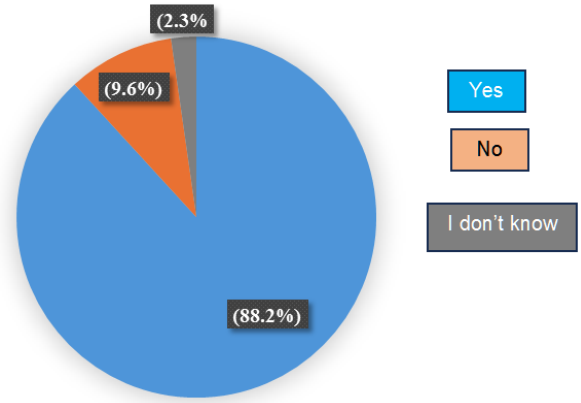

Fig. 2: Distribution of the Population According to Level of Knowledge of the Vaccine Antipalidic.

Frequency of malaria vaccine acceptability: In our study, 223 participants (56.2%) agreed to vaccinate their children against malaria. In contrast, 107 participants (27.0%) refused, while 67 participants (16.9%) were undecided (Fig 3).

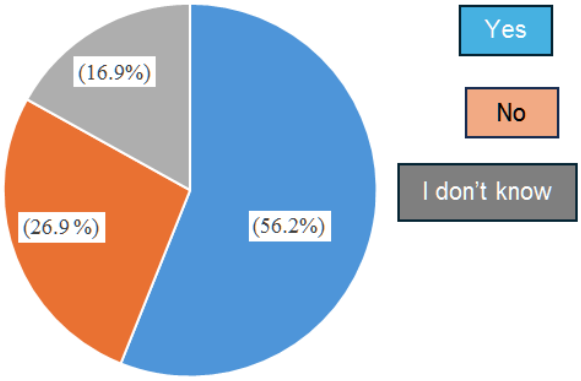

Fig. 3: Prevalence of malaria vaccine acceptability among study participants.

Reasons for non-acceptance of malaria vaccine: Table V shows that the main reasons for refusing malaria vaccination were fear of adverse effects (75.2%, or 131 participants) and lack of confidence in the laboratory (12.1 %, or 21 participants).

Table VI: Reasons for non-acceptance of antimalarial drugs by participants in the study.

Reasons for non-acceptability	Number (N)	Percentage (%)
Fear of adverse effects	131	**75.2**
Lack of information about the vaccine	20	11.5
Lack of trust (laboratories)	21	12.1
Not wanting to be among the first to be vaccinated (guinea pig)	2	1.2

Factors influencing malaria vaccine acceptability: Fear of side effects (31.2%) and recommendations from health professionals (49.9%) were the main factors influencing acceptability of the malaria vaccine among participants in this study (Table VI).

Table VII: Factors Influencing Vaccine Acceptability

Variable	Number (N)	Percentage (%)
Factors		
Recommendation by a healthcare professional	124	**31.2**
Vaccine cost	16	4.0
Vaccine accessibility	19	4.8
Fear of side effects	198	**49.9**
Religious or cultural beliefs	8	2.0
Past experiences with vaccines	32	8.1

Factors associated with malaria vaccine acceptability Association between age, gender and vaccine acceptability: Malaria vaccine acceptability varied significantly with age, with older age groups (45-50 years) showing higher and statistically significant acceptability (p = 0.005). However, no significant difference in vaccine acceptability was observed between the sexes (Table VII).

Table VIII: Association between age, gender and vaccine acceptability.

Vaccine acceptability							
Variable	**Yes N*= |222| (56%**)**	**No N*= |107| (27%**)**	**None N*= |67| (17%**)**	**RR**	**OR**	**I.C (95%)**	**P-Value**
Age by years							
[18 –20)	45(2%)	30(1%)	5	1.57	0.6	0.3-1.11	0.006
[20 –25)	55(14.6%)	20(5%)	10(2.3%)	0.60	0.5	0.25 -0.75	**0.47**
25 – 30)	65(17.3%)	25(9.3%)	5(4.3%)	1.30	1.20	0.90 -1.50	0.15
[30 –35)	60(10%)	20(7.3%)	10(6%)	1.70	1.50	1.10 -2.20	**0.05**
[35 –40)	50(9.6%)	10(3.5%)	5(3.7%)	2.80	2.50	1.70 -3.00	0.01
[40 –45)	30(1.8%)	5(0.8%)	5(0.2%)	1.37	1.38	0.8-6.41	0.01
[45 –50)	25(0.5%)	5	1(0.2%)	3.00	3.50	2.10 -4.00	**0.005**
Sex							
Male	45(11.3%)	31(7.8%)	18(4.5%)	0.72	0.65	1.03 -0.41	0.130
Fémale	177(44.5%)	76(19.1%)	49(12.3%)	1.11	1.54	2.45 -0.97	0.419

N: numbers **%: percentage ***OR: Odds Ratio ****CI: Confidence Interval

Association between level of confidence in vaccine efficacy, health authorities and Vaccine Acceptability: The results show that confidence in vaccine efficacy (p = 0.04) and confidence in health authorities (p < 0.001) is significantly associated with malaria vaccine acceptance (Table IX).

Table IX: Association between level of confidence in vaccine efficacy, health authorities and vaccine acceptability.

Vaccine Acceptability							
Variables	**Yes N*= |222| (56%**)**	**No N*= |107| (27%**)**	**I don't N*= |67| (17%**)**	**RR**	**OR**	**I.C (95%)**	**P Value**
Do you have confidence in the vaccine's efficacy?							
Not at all confident	1(2.9%)	33(97.1%)	2(5.6%)	0.02	0.02	0.01 -0,09	0.007
Very little confidence	10(20%)	40(80%)	3(6.7%)	0.09	0.09	0.04 -0,19	0.006
Very confident	203(93.5%)	14(6.4%)	6(2.8%)	8.14	7.14	4.93 -13.43	**0.004**
Do you trust the health authorities?							
Completely confident	70(83.3%)	5(6%)	10(11,9%)	4.76	8.00	2.93 -21.83	**<0.001**

Neutral	50(66.7%)	10(13.3%)	10(13.3%)	2.00	3.50	1.71 – 7.16	0.001
Not at all confident	10(20%)	40(80%)	5(10%)	0.25	0.12	0.05 -0.31	**<0.001**

N: Number **%: percentage ***OR: Odds Ratio ****CI: Confidence Interval

Association between malaria knowledge and vaccine acceptability: The results indicate that malaria knowledge, whether present or absent, has no statistically significant relationship with malaria vaccine acceptability in the study population.

Vaccine Acceptability							
Variables	**Yes N*= |222| (56%**)**	**No N*= |107| (27%**)**	**I don't know N*= |67| (17%**)**	**RR**	**OR**	**I.C (95%)**	**P Value**
Knowledge of malaria							
Yes	217	105	66	0.94	0.82	0.59 -1.48	0.25
No	5	2	1	1.05	1.21	0.23 -6.33	0.81

N: Number **%: percentage ***OR: Odds Ratio ****CI: Confidence Interval

Association between monthly economic income and vaccine acceptability: The results show that the economic income of participants, particularly those with incomes between 0 and 50,000 CFA francs and between 151,000 and 250,000 CFA francs, is significantly associated with acceptance of the malaria vaccine.

Table X: Association between Monthly Economic Income And Vaccine Acceptability

Vaccine Acceptability							
Variables	**Yes N*= |222| (56%**)**	**No N*= |107| (27%**)**	**I don't know N*= |67| (17%**)**	**RR**	**OR**	**I.C (95%)**	**P Value**
Economic income							
0- 50 000 Francs CFA	87(39.1%)	40(37.3%)	10(14.9%)	REF	1.33	2.02 -0.87	**0.015**
51 000- 100 000 Francs CFA	28(12.6%)	15(14.01%)	5(7.4%)	0.91	0.88	0.45- 1.73	0.74
101000- 150 000 Francs CFA	90(40.5%)	19(17.7%)	10(14.9%)	1.19	3.15	1.79-5.54	0.33
151 000 fr- 250 000 Francs CFA	76(34.2%)	10(9.3%)	6(8.9%)	1.30	3.42	0.78 ; 2.71	**0030**

N: Number **%: percentage ***OR: Odds Ratio ****CI: Confidence Interval

Association between Religion and Vaccine Acceptability: Catholics and Protestants were significantly associated with the acceptance of malaria vaccine in the study population. (Table XI).

Table XI: Association between religion and vaccine acceptability.

Variables	**OR adjusted**	**95% CI**	**P Value Adjusted**
AGE			
15 – 20 Years	1.59	0.47-5.37	0.006
20 – 25 Years	1.77	2.91-1.07	0.047
25 - 30 Years	1.00	0.65-1.54	0.066
30 – 35 Years	0.50	0.31-0.80	0.050
35 – 40 Years	1.03	0.60-1.75	0.036
40 – 45 Years	1.38	0.40-4.80	0.006
45 – 50 Years	1.57	0.14-17.49	0.002
Religion			
	1.23	0.80-1.87	0.038
Catholic	0.98	0.65-1.48	0.040
Mulsuman	0.80	0.52-1.22	0.034
Protestant	-	-	-
Other			
Do you trust the effectiveness of the vaccine?	0.02	0.01-0.09	0.007
Not at all trustworthy	0.09	0.04 -0.19	0.0072
Very little confidence.	8.14	4.93-13.43	0.004
Highly trusted			
Do you trust the health authorities?	8.00	2.93 -21.83	0.005
Fully trusted	3.50	1.71-7.16	0.006
Neutral	0.12	0.05-0.31	0.006
Economic income			

0- 50 000 Francs CFA	0.55	0.21-0.90	0.051
51 000- 100 000 Francs CFA	0.58	-0.89- 0.45	0.018
101000- 150 000 Francs CFA	1.00	0.03-1.12	0.044
151 000 fr- 250 000 Francs CFA	1.00	0.36 -1.65	0.034

N: Number **%: percentage ***OR: Odds Ratio ****CI: Confidence Interval

Association between family relationship and vaccine acceptability: The study showed no association between relatedness and acceptability of the malaria vaccine. Logistic regression of factors associated with malaria vaccine acceptability.

Table XII: Logistic regression of factors associated with the acceptability of malaria vaccine.

Vaccine Acceptability							
Variables	**Yes N*= |222| (56%**)**	**No N*= |107| (27%**)**	**I don't know N*= |67| (17%**)**	**RR**	**OR**	**95% CI**	**P Value**
Relationship							
Mother	173	72	17	0.51	0.45	2.56 ; 1.04	0,087
Father	42	27	48	1.14	2.25	1.11 ; 0.43	0,472
Guardian	7	8	2	0.39	0.39	1.27 ; 0.18	0,004

N: Number **%: percentage ***OR: Odds Ratio ****CI: Confidence Interval

DISCUSSION

Socio-demographic characteristics: The average age of participants was 29 ± 5.8 years, with extreme values ranging from 18 to 49 years. This figure is lower than those observed in Ethiopia (32 years according to Asmare in 2022) and Bangladesh (33 years according to Afrin et al., in 2023).[33,37] This relatively low average suggests a greater involvement of young parents in their children's vaccination decisions.

The sex ratio was clearly in favor of women, a trend corroborated by several previous studies carried out in Ethiopia, Bangladesh, Cameroon and Nigeria.[32,36-40] This predominance of women underlines the central role played by mothers in decisions relating to child health. Indeed, mothers are often primarily responsible for their children's health care, which could explain their majority representation in this study.

Furthermore, a significant proportion of participants (64.7%) had a higher level of education. This result is comparable to those reported by Getachew et al. in Ethiopia (2022) and Bangladesh, where almost half the respondents also had a higher level of education.[32,36] In terms of income, more than a third of participants (34.5%) had a monthly income of between 0 and 50,000 FCFA, close to the minimum wage in Cameroon (36,270 FCFA). Similar observations were made by Ughasoro et al. in Nigeria in 2018, where a majority of the study population reported low incomes.[35] The integration of Couverture Sanitaire Universelle (CSU) in Cameroon plays a key role in improving access to vaccination and antimalarial treatment for children under 5. Free access to malaria-related services, including vaccination, is an essential measure for reducing the burden of this disease in socio-economically disadvantaged groups.[39]

Knowledge of malaria and vaccination: The study revealed that 99.5% of participants had adequate knowledge of malaria transmission modes. This result is in line with that obtained in Ethiopia in 2022 by Asmare[32], where higher vaccine acceptance was observed among people with direct experience of severe malaria. Good understanding of the vaccine was also reported in this study, albeit slightly lower (84%).[32] Furthermore, vaccine acceptance was higher among those with personal experience of severe malaria, corroborating the data.These results are also in line with those obtained in Cameroon by **Ateke et al.** in 2024[39], and with the study carried out in Nigeria by **Ughasoro et al.** in 2023.[34] These studies have shown that trust in the health authorities plays a decisive role in vaccine acceptability.

Specific malaria vaccine knowledge and frequency of malaria vaccine acceptability: The frequency of malaria vaccine acceptability in the study was 56.2%. This result is slightly comparable to that obtained in the Democratic Republic of Congo, where a study conducted by Nyalundja et al. in 2024 reported a frequency of 52.6%.[40] However, it is lower than that reported by Ughasoro et al. in 2018 in Nigeria, where 92% of parents were in favor of malaria vaccination for their children.[34] Ateke et al. in 2024 also reported very high acceptability in Cameroon, reaching 91%, although regional variations were observed, ranging from 78% to 94%.[40] By contrast, in Ethiopia in 2022, acceptability was significantly lower, at 32%.[32] These data show that, although overall vaccine acceptability is satisfactory, there is still room for improvement. Awareness campaigns appear to be a crucial lever for increasing acceptability, particularly in regions where knowledge of the vaccine remains limited. Among participants who refused the vaccine, the main reason given was fear of adverse effects, cited by 75%. Malaria vaccine acceptability is therefore a complex phenomenon, influenced by multiple factors. To improve uptake, it is essential to step up awareness-raising and education initiatives, while taking into account the educational levels and economic constraints of the target populations.

Factors associated with malaria vaccine acceptability. The study results show that certain age groups, notably the 18-20, 20-25, 30-35 and 45-50 age groups, have a higher probability of accepting the malaria vaccine. These results are consistent with those of the study conducted by Ateke et al. in 2024, which also showed higher acceptability among young people (18-25 years.[40] Furthermore, gender analyses revealed no significant difference in vaccine acceptance, which corroborates the observations of the study by Ateke et al. in 2024 in Cameroon, where the gender difference was not significant for vaccine acceptability.

Confidence in vaccine efficacy and in health authorities was found to be strongly associated with malaria vaccine acceptability. This result is consistent with that obtained in Tanzania by Mtenga et al. in 2016, where high confidence in vaccine efficacy was associated with a high acceptance rate (84.2%).[33]

Similarly, a study carried out in Bangladesh by Afrin et al. in 2023 showed that vaccine acceptance was influenced by parents' confidence in the health authorities, with an acceptance rate of 70% among respondents.[36] These findings underline the importance of strategies aimed at improving awareness, providing clear and transparent information, and building trust in health institutions, essential for increasing vaccine acceptability.

In the study, 35% of participants had a monthly income of between 0 and 50,000 CFA francs, while 30% had a monthly income of between 101,000 and 150,000 CFA francs. Monthly economic income influenced malaria vaccine acceptability, with higher acceptability observed among low-income participants.

This result is in line with the findings of the study conducted in Cameroon by Ateke et al. in 2024, where low-income groups showed high acceptability[40], as well as those of the study conducted in Tanzania in 2016, which also showed increased acceptability among low-income groups, supported by targeted awareness campaigns.[33] These data suggest that low-income people perceive a more immediate and necessary benefit from vaccination, due to potentially higher exposure to malaria and limited access to healthcare.

Conversely, participants with higher incomes appear to favor other malaria prevention options, or express skepticism about the need for the vaccine.

Finally, religion was identified as a factor influencing malaria vaccine acceptability. This finding is in line with the results of Ateke et al. in 2024 in Cameroon, where high acceptability was observed among Catholics, thanks to effective awareness-raising.[38] Similarly, Nyalundja et al. in 2024 in the Democratic Republic of Congo showed that religion played a major role in malaria vaccine acceptability.[40]

CONCLUSION

The study of malaria vaccine acceptability among children aged 0-5 years in hospitals in Douala revealed encouraging results, while highlighting certain challenges. Acceptability of the RTSS/AS01 vaccine is relatively high, with a prevalence of 56.2% among participants. Acceptability is largely influenced by trust in health authorities and perceptions of vaccine efficacy.

However, to maximize the impact of malaria vaccination, it is essential to overcome the remaining barriers. Efforts must focus on improving specific knowledge about the malaria vaccine and tackling the negative perceptions that could hinder its uptake.

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