Journal of Interventional Epidemiology and Public Health
eISSN: 2664-2824

Factors influencing early care-seeking for malaria management among pregnant women in the Boussé Health District, Burkina Faso: A mixed-methods study

Youssouf Bagayan[1,2], Toussaint Rouamba[2], Fanta Sogoré[1,3], Botovola Miraimila[1,4], Biébo Bihoun[2], Halidou Tinto[2], Kassoum Kayentao[1,3]

[1]Département d'Enseignement et de Recherche en Santé Publique et Spécialités, Université des Sciences, des Techniques et des Technologies de Bamako, Bamako, Mali, [2]Unité de Recherche Clinique de Nanoro, Institut de Recherche en Sciences de la Santé, Nanoro, Burkina Faso, [3]Malaria Research and Training Centre, Université des Sciences, des Techniques et des Technologies de Bamako, Bamako, Mali, [4]Faculté de Médecine, Université d'Antananarivo, Antananarivo, Madagascar

Youssouf Bagayan, Département d'Enseignement et de Recherche en Santé Publique et Spécialités, Université des Sciences, des Techniques et des Technologies de Bamako, Bamako, Mali,
| Email: bagayany@yahoo.com | ORCID: 0009-0009-9222-7985

Article history: **Received:** 19 March 2025 **Accepted:** 08 February 2026 **Published:** 11 February 2026

Abstract

Introduction: World Health Organization recommends that pregnant women immediately consult a health professional at the onset of malaria symptoms. However, the seeking of pregnant women to malaria management within 24 hours in health centres remains low in our context. We assessed the factors influencing early seeking of pregnant women to malaria management in health centres.

Methods: A mixed-methods study was conducted in the Boussé health district from November to December 2024. The study combined quantitative interviews, in-depth individual interviews and focus group discussions with pregnant women, healthcare providers, and community-based health workers. Quantitatively, associated factors were assessed through a multivariate logistic regression, an odds ratio with 95% confidence interval and a p-value<0.05. A thematic analysis was carried out for the qualitative component.

Results: A total of 220 pregnant women were interviewed in a quantitative study. Their average age was 25.3 (standard deviation (SD)=6.3) years. They were 29.5% primigravida, 39.5% paucigravida and 30.9% multigravida. Out of them, 60.5% had early seeking of malaria management in health centres. In multivariate analysis, the factors favouring this early seeking to malaria management were: family/husband financial support (aOR=2.9 [1.31-6.41]), distance to health centres less than five kilometres (aOR=1.87 [1.04-3.38]), and the factors hindering this early seeking were: self-medication (aOR=0.38 [0.2-0.75]), availability of a motorbike in the household (aOR=0.26 [0.08-0.8]) and shortages of curative antimalarial drug during a previous consultation (aOR=0.21 [0.07-0.66]). Participants in the qualitative study were 45 pregnant women (12 primigravida, 17 paucigravida, 16 multigravidas), 10 midwives and 10 community-based health workers. According to the participants, factors influencing this early seeking included: distance to health centres, lack/unavailability of means of transport, drug shortages, family support, lack of money, and delayed decision-making.

Conclusions: Pregnant women's early seeking of malaria management in health centres is mainly influenced by factors related to the pregnant women (self-medication, delayed decision-making), sociocultural factors (family support, lack of money), health system and health access factors (distance to health centres, lack/unavailability of means of transport, drug shortages). Efforts by the Ministry of Health, pregnant women and communities are therefore essential to improve early seeking of malaria management and advancing malaria prevention and control.

Keywords: Factors, early seeking, malaria management, pregnancy, Burkina Faso

Citation

Suggested citation: Bagayan Y, Rouamba T, Sogoré F, Miraimila B, Bihoun B, Tinto H, Kayentao K. Factors influencing early care-seeking for malaria management among pregnant women in the Boussé Health District, Burkina Faso: A mixed-methods study. J Interv Epidemiol Public Health [Internet]. 2026 [cited 2026 Feb 11];9(1):26. doi: 10.37432/jieph-d-25-00075

Introduction

Malaria in pregnancy is a significant public health issue posing a very serious risk for mothers and foetuses [1,2]. In 2023, approximately 12.4 million (34%) pregnant women in 33 countries with moderate to high transmission in the World Health Organization (WHO) African Region were exposed to malaria infection, with 36.4% in West Africa [3]. Annually, malaria during pregnancy is estimated to cause 10,000 maternal deaths worldwide, 20% of stillbirths, and 11% of all neonatal deaths occurring in sub-Saharan Africa [2,4,5].

One important component of the WHO's strategies to combat and eliminate malaria is malaria case management, which includes early diagnosis and prompt administration of effective treatment within 24 to 48 hours of the onset of symptoms [6]. This case management remains essential in the fight against malaria, as some pregnant women will still be affected by the disease despite preventive measures [1,7]. The WHO also emphasizes that as malaria transmission decreases, malaria during pregnancy can become more severe due to reduced immunity and then it is crucial to intensify efforts to detect and treat all cases [2,8].

The WHO therefore recommends that pregnant women, exhibiting signs or symptoms of malaria, go immediately to the health facility for appropriate diagnosis and treatment in order to prevent the progression of uncomplicated malaria to severe malaria, which can lead to maternal and foetal death [2]. However, in malaria endemic regions with limited access to medical care, it is common for women with typical malaria symptoms to resort to self-diagnosis and self-medication. They often purchase medications without a prescription or verification of their diagnosis from pharmacies, local shops, roadside kiosks, and other easily accessible locations [7] before visiting a health centre or not at all.

Burkina Faso is endemic for malaria, and malaria in pregnancy remains a significant public health issue [9]. To control and eliminate malaria in pregnancy, Burkina Faso has implemented malaria case management across all health facilities and, since May 2016, has provided free healthcare for pregnant women [10–12]. Despite these efforts, the burden of malaria in pregnancy in Burkina Faso remains significant [9]. In 2023, there were approximately 483,121 cases of uncomplicated malaria and 30,102 cases of severe malaria during pregnancy, with a lethality rate of 1‰ [9]. This suggests that the rate of seeking antimalaria care in health centres, within 24 hours of the onset of malaria symptoms, remains a challenge and is still suboptimal. Indeed, in a population-based study conducted in 2018-2019 in Kaya, Burkina Faso, 90.6% (29/32) sought antimalarial care in the event of fever/malaria in a health centre, while 62.5% (20 out of 32) sought care from all sources within 24 hours of fever onset [13].

Moreover, in our context, very few studies have been conducted to identify and understand the factors influencing pregnant women's early seeking of malaria management in health centres.

In the Boussé health district (HD), a qualitative study conducted in 2019 at the Boussé district hospital found that 92% of the pregnant women surveyed preferred modern medicine as their first therapeutic option, often associated with "home medicine" [14]. However, this study did not address the timing of seeking malaria management in health centres.

In order to develop strategies for combating and controlling malaria and to advocate for policy changes regarding the management of gestational malaria within this context, we conducted a mixed-methods study. The objective was to assess the factors related to pregnant women, health system, health access factors, and sociocultural factors that could influence the early seeking of pregnant women to malaria management in health centres.

Methods

Study setting

TOur study took place in the Boussé HD, located in the central plateau region and 55 kilometres northeast of Ouagadougou (the capital of Burkina Faso). The HD covers an area of 1,595 square kilometres [9]. It has 36 public and two private health facilities [9]. In 2023, the population of the Boussé HD was estimated at 198,886, including 46,797 women of childbearing age and 9,775 expected pregnancies [9]. The number of confirmed cases of simple malaria and severe malaria among pregnant women was 5,256 and 313, respectively, in 2023 [9].

Study design

A cross-sectional study was conducted, using quantitative and qualitative approaches. The quantitative component consisted of an analytical cross-sectional survey, while the qualitative component included in-depth individual interviews and focus group discussions (FGDs).

Study population

For the quantitative component, the study population consisted of pregnant women. We included those who had malaria, who received malaria management (diagnosed by microscopy and/or malaria rapid diagnostic test followed by curative treatment) at a health centre in the Boussé HD during the data collection period (November 10 to December 16, 2024). For the qualitative component, the study population included pregnant women, health providers and community-based health workers (CBHWs). Eligible participants were: (i) pregnant women who had received malaria management during pregnancy at a health centre, (ii) health providers providing antenatal care

services, and (iii) CBHWs delivering curative or preventive antimalarial care in the Boussé HD. Participants who did not speak or understand French or the local language (Mooré) were excluded.

Quantitative sampling

The sample size was calculated with Fleiss's w/CC method using Statcalc on Epi-Info 7.6.0. We assumed a proportion of 50% of pregnant women seeking malaria management in a health centre within 24 hours of the onset of symptoms. Assuming that exposure to an unknown factor should increase this proportion to 70% reflecting a relative increase of 40% and corresponding an odds ratio of 2.33, and considering a two-sided confidence level at 95%, an unexposed/exposed ratio of 1, a power of 80%, a non-response and missing data rate r = 5%, our minimum sample size was 217 women to be surveyed. A simple random sampling method was used to select 10 out of 33 Social Promotion and Health Centres (SPHCs) in the Boussé HD, based on the planned data collection period and the expected patient flow at each facility and using Excel's RAND() function to ensure equal probability of selection. In each health centre, all eligible pregnant women were included and interviewed in the order of their arrival, after being seen by a health provider during the data collection period.

Qualitative sampling

A total of 65 participants were selected for the qualitative component. For the in-depth individual interviews, we purposively selected a health provider, a CBHW and a pregnant woman from each selected health centre for the quantitative component, resulting in a total of 30 in-depth individual interviews.

Four FGDs were conducted, each comprising 8 to 10 pregnant women. From the 10 health centres selected in the quantitative component, four health centres were conveniently chosen for the FGDs. Within the health area of each chosen health centre, pregnant women were then purposively selected, at least one pregnant woman from each gravidity category (primigravida, paucigravida and multigravida) in each focus group, ensuring a minimum level of diversity in pregnancy experience.

Study variables and themes

The dependent variable was early seeking of malaria management in a health centre with two possible responses: "yes" and "no". "Yes" was defined as a pregnant woman who consulted at a health centre within 24 hours of the onset of malaria symptoms and received malaria management. "No" was defined as a pregnant woman who consulted at a health centre more than 24 hours after the onset of malaria symptoms and received malaria management.

Explanatory variables included: Factors related to pregnant woman include: age, educational status, occupation, main personal mode of transport, marital status, gravidity, parity, trimester of pregnancy, outcome of previous pregnancy, history of stillbirth, presence of a child under 5 years, previous episode of malaria during pregnancy, self-medication; Socio-cultural factors include: household size, occupation of husband/pregnancy author, educational status of husband/pregnancy author, husband/family permission, husband/family support, household assets; Health system and health access factors include: shortage of curative antimalarial drugs and malaria diagnostic tests, side-effects of antimalarial drugs, cost of malaria diagnosis, consultation and antimalarial drugs, good reception, reputation and skills of health workers, distance from home to health centre, mode of transport from home to health centre, time from home to health centre.

Information on these variables was collected through self-reporting by study participants and their antenatal consultation diaries and health registers. The main domains of focus used in the qualitative interviews were early seeking of pregnant women to malaria management in health centres, and the factors influencing this early seeking of malaria management.

Data collection

Female interviewers for the quantitative component and sociologists for the qualitative component were recruited and trained on the protocol, study procedures, and good clinical practices. This training was followed by a pretest conducted at an unselected health centre in the Boussé HD to identify any issues related to the tools, study procedures and protocol introduced. Quantitative and qualitative data were collected simultaneously from November 10 to December 16, 2024.

For the quantitative study, data were collected face-to-face from participants and their antenatal consultation diaries and health registers, during visits to the selected health centres after they had seen a health provider. A semi-open electronic questionnaire developed on the Research Electronic Data Capture was administered via an Android tablet. Pregnant women were interviewed only during their first malaria management visit within the study period. Antenatal consultation diaries and consultation registers were used to verify and confirm malaria management.

For the qualitative study, we conducted face-to-face interviews at convenient locations (health centres, homes, public places) for participants lasting between 25 and 90 minutes. Interview guides were administered through in-depth individual interviews and FGDs. Data saturation was reached with the 65 participants. The sessions were recorded using a tape recorder.

Data analysis

For the quantitative component, variable recoding and data analysis were conducted using Excel 365 and SPSS (Statistical Package for the Social Sciences) version 25. Frequency tables were utilised for categorical variables. For quantitative variables, the mean and standard deviation (SD) were used when the distribution was normal. A univariate logistic regression was performed for each model to identify factors associated with the dependent variable. Factors with a p-value of 0.20 or below from the univariate analyses were included in a forward stepwise multivariate logistic regression using the Likelihood Ratio Test to select the final model. The Hosmer-Lemeshow goodness-of-fit test was used to assess how well the final model fit the data. A p-value < 0.05 was the statistical significance. We presented the estimates of the odds ratio (OR) with its 95% confidence interval (CI).

For the qualitative component, recorded audio files were translated if necessary and transcribed into French. These transcriptions were made by three social science specialists, and their quality was checked by a fourth person to ensure accuracy. The transcripts and notes were then imported into MAXQDA version 24 software for coding and thematic analysis. The verbatims were examined line by line to generate predefined codes (deductive approach) and emergent codes (inductive approach). Similar codes were grouped into sub-themes, which were then organised under broader themes. Finally, we conducted a triangulation of quantitative and qualitative data to enhance interpretation and strengthen the validation of the conclusions.

Ethical and deontological considerations

The protocol was approved by the Comité d'éthique pour la recherche en santé au Burkina Faso under deliberation No. 2024-10-324 of October 2, 2024. It also received authorisation from the Ministry of Health in Burkina Faso on October 24, 2024. After explaining the study in a convenient language, free and informed consent of the participants was obtained and conducted with a witness if the participant was illiterate.

Results

Quantitative findings

The quantitative study was conducted on all 220 pregnant women who received malaria management in the 10 health centres. The average age of the pregnant women was 25.3 (SD=6.3) years. Of the pregnant women, 29.5% (n=65) were primigravida, 39.5% (n=87) were paucigravida, and 30.9 (n=68) were multigravida. Self-medication was observed in 25.5% (n=56) of women (Table 1). The average household size for pregnant women was 4.8 (SD=2.6) members per household. Household assets included motorbikes in 88.6% (n=195) of women.

Table 1. Sociodemographic characteristics of the pregnant women in the Boussé health district, Burkina Faso, 2024 (N=220)

Variables	Frequency (n)	Percentage (%)
Marital status		
Married	217	98.6
Single	3	1.4
Educational status		
Uneducated	111	50.5
Educated	109	49.5
Occupation		
Housewife	102	46.4
Farmer/Breeder	74	33.6
Informal sector	35	15.9
Student	5	2.3
Employee	4	1.8
Main personal mode of transport		
Bike	142	64.5
Motorbike	45	20.5
Foot	33	15.0
Previous episode of malaria during pregnancy		
Yes	79	34.9
No	141	64.1
Self-medication		
Yes	56	25.5
No	164	74.5
Trimester of pregnancy		
1st trimester	75	34.1
2nd trimester	70	31.8
3rd trimester	75	34.1
Gravidity		
Primigravida	65	29.5
Paucigravida	87	39.5
Multigravida	68	30.9
Parity		
Primiparous	51	23.2
Pauciparous	59	26.8
Multiparous	43	19.5
Nulliparous	67	30.5
Outcome of previous pregnancy		
Live birth	135	61.4
Miscarriage/abortion	12	5.5
Stillbirth	8	3.6
History of stillbirth		
Yes	18	8.2
No	202	91.8
Presence of children under 5 years old		
Yes	112	50.9
No	108	49.1

Family/husband support for consultation at the health centre was financial in 83.2% (n=183) of women (Table 2).

Health system and health access factors

Antimalarial drug shortages during a previous consultation were reported in 8.6% (n=19) of women (Table 3). The distance from home to health centres was less than five

 doi: 10.37432/jieph-d-25-00075

Table 2. Sociocultural factors of the pregnant women in the Boussé health district, Burkina Faso, 2024 (N=220)

Variables	Frequency (n)	Percentage (%)
Household size		
≤ 5 people	145	65.9
> 5 people	75	34.1
Household assets[a]		
Bike	209	95.0
Motorbike	195	88.6
Car	9	4.1
Animal-drawn cart	87	39.5
Phone	207	94.1
Radio	78	35.5
Television	47	21.4
Occupation of husband / pregnancy author		
Farmer/breeder	119	54.1
Informal sector	74	33.6
Employee	26	11.8
Student	1	0.5
Educational status of husband / pregnancy author		
Uneducated	112	50.9
Educated	108	49.1
Desired pregnancy		
Yes	209	95.0
No	11	5.0
Family / husband permission		
Yes	202	91.8
No	18	8.2
Family / husband support[a]		
Financial	183	83.2
Accompaniment	122	55.5
None	24	10.9

[a] Multiple answers possible.

kilometres in 57.7% (n=127) of women. Time from home to health centre was less than or equal to 30 minutes in 72.2% (n=160) of women. Diagnostic tests and antimalarial drugs were provided free of charge at health centres for pregnant women. The proportion of pregnant women who had an early seeking of malaria management in health centres was 60.5% (n=133).

Factors influencing early seeking of malaria management in health centres

In multivariate analysis, the factors influencing, significantly, the early seeking of pregnant women to malaria management in health centres included: distance to health centre less than five kilometres (Adjusted OR (aOR)=1.87, 95%CI=[1.04-3.38], p=0.037), availability of motorbike in the household (aOR=0.26, 95%CI=[0.08-0.8], p=0.019), family/husband financial support (aOR=2.9, 95%CI=[1.31-6.41], p=0.009), self-medication (aOR=0.38, 95%CI=[0.2-0.75], p=0.005), shortages of curative antimalarial drugs during a previous consultation (aOR=0.21, 95%CI=[0.07-0.66], p=0.007) (Table 4).

Qualitative findings

Characteristics of participants

There were 45 pregnant women with an average age of 25.8 years (SD=6.6). There were 12 primigravida, 17 paucigravida, and 16 multigravida. Additionally, 30 (67.7%) pregnant women lived less than five kilometres away. The study also included 10 midwives, 90% of whom were heads of the maternity service. Their sex ratio was 0.43. Finally, there were 10 CBHWs with a sex ratio of 0.66.

Early seeking of malaria management in health centres

Pregnant women seeking malaria management in health centres within 24 hours following the onset of symptoms was cited by the majority of women. These statements testify to this:

"For me, it started late at night, but the next day at 8 am, I was already at the health centre waiting for the health workers. (FGD, Pregnant women).

Other women had a late seeking of malaria management in health centres :

"I spent two days before going to the health centre" (individual interview, pregnant woman).

Factors influencing early seeking of malaria management in health centres

Several participants mentioned self-medication, particularly with analgesics/antipyretics, as a factor influencing the early seeking of malaria management in health centres. Pregnant women took medications to alleviate symptoms, which delayed their seeking care in health centres. These verbatim support this:

"I first took paracetamol, thinking it would go away, but it got worse during the night, so I went to the health centre before the health workers arrived the next day."(Individual interview, pregnant woman)

"As they often have paracetamol or traditional medicines at home, they tell themselves that it will pass, and it is when there is no good result that they come for a consultation now." (individual interview, CBHW)

Additionally, the delay in decision-making to seek care at health centres was a factor mentioned by the various participants. This delay stemmed from the negligence and inability of women to determine whether to seek appropriate care after the onset of symptoms. These

Table 3. Health system and health access factors among the pregnant women in the Boussé health district, Burkina Faso, 2024 (N=220)

Variables	Frequency (n)	Percentage (%)
Shortages of malaria diagnostic tests		
Yes	21	9.5
No	199	90.5
Shortages of curative antimalarial drugs		
Yes	19	8.6
No	201	91.4
Side effects after taking antimalarial curative drugs		
Yes	19	8.6
No	201	91.4
Good skills of health workers		
Totally agree	105	47.7
Agree	111	50.4
Neither agree nor disagree	3	1.4
Disagree	1	0.5
Good reputation of health workers		
Totally agree	108	49.1
Agree	109	49.5
Neither agree nor disagree	3	1.4
Good reception of health workers		
Totally agree	105	47.7
Agree	112	50.9
Neither agree nor disagree	3	1.4
Mode of transport from home to health centre		
Bike	104	47.3
Motorbike	106	48.2
Car	1	0.5
Animal-drawn cart	1	0.5
Foot	8	3.6
Distance from home to health centres		
< 5 kilometres	127	57.7
≥ 5 kilometres	93	42.3
Time from home to health centre		
≤ 30 minutes	160	72.7
> 30 minutes	60	27.3

verbatims illustrate this:

"It depends on the fever. If it's not too high, we try to wait a bit to see if the temperature will go down on its own." (FGD, pregnant woman).

"In fact, when things aren't going well for them, they want to wait, believing that it will pass, but it's when it doesn't pass that, they come to the SPHC" (individual interview, midwife).

The lack of empowerment of women, resulting in a lack of money and their state of pregnancy, leads them to rely on their husband or relatives for covering costs related to medication shortages and transport to the health centre. Thus, the study participants mentioned the lack of money and the lack of family support, specifically financial assistance, and accompaniment, as factors which hindered this early seeking of malaria management in these verbatim:

"When you don't have (…) a companion, it can be an obstacle that prevents you from going there in less than 24 hours." (individual interview, pregnant woman).

"And often also the lack of financial support, they often say to themselves that by going to the health centre they can be prescribed a medication that they will not be able to honour the prescription and prefer to stay at home to hide the illness and ask God to give them health." (individual interview, Midwife).

The shortage of antimalarial drugs, along with other medications, was identified by the actors as a factor that hindered the early seeking of malaria management. Indeed, the shortages forced pregnant women to buy certain drugs outside the health centres when they went to consult, which discouraged them from returning due to their limited

 doi: 10.37432/jieph-d-25-00075

Table 4. Factors influencing the early seeking of pregnant women to malaria management in health centres

Variables	Early seeking		Univariate analysis		Multivariate analysis	
	Yes n (%)	No n (%)	OR [95% CI]	p-value	Adjusted OR [95% CI]	p-value
Self-medication						
Yes	23 (41.1)	33 (58.9)	0.34 [0.18–0.64]	0.001	0.38 [0.20–0.75]	0.005
No	110 (67.1)	54 (32.9)	1	–	1	–
Household size						
≤ 5 people	95 (65.5)	50 (34.5)	1.85 [1.05–3.26]	0.034	–	–
> 5 people	38 (50.7)	37 (49.3)	1	–	1	–
Motorbike in the household						
Yes	113 (57.9)	82 (42.1)	0.35 [0.12–0.96]	0.041	0.26 [0.08–0.80]	0.019
No	20 (80)	5 (20)	1	–	1	–
Radio in household						
Yes	52 (66.7)	26 (33.3)	1.51 [0.85–2.68]	0.164	–	–
No	81 (57)	61 (43)	1	–	1	–
Desired pregnancy						
Yes	129 (61.7)	80 (38.3)	2.82 [0.80–9.95]	0.107	–	–
No	4 (36.4)	7 (63.6)	1	–	1	–
Family / husband financial support						
Yes	117 (63.9)	66 (36.1)	2.33 [1.14–4.77]	0.021	2.90 [1.31–6.41]	0.009
No	16 (43.2)	21 (56.8)	1	–	1	–
No family / husband support						
Yes	10 (41.7)	14 (58.3)	0.42 [0.18–1.00]	0.051	–	–
No	123 (62.8)	73 (37.2)	1	–	1	–
Shortages of malaria diagnostic tests						
Yes	14 (53.8)	12 (46.2)	0.45 [0.18–1.12]	0.089	–	–
No	73 (37.6)	121 (62.4)	1	–	1	–
Shortages of curative antimalarial drugs						
Yes	15 (60)	10 (40)	0.27 [0.10–0.74]	0.011	0.21 [0.07–0.66]	0.007
No	72 (36.9)	123 (63.1)	1	–	1	–
Side effects after taking antimalarial curative drugs						
Yes	8 (42.1)	11 (57.9)	0.44 [0.17–1.15]	0.094	–	–
No	125 (62.2)	76 (37.8)	1	–	1	–
Distance from home to health centres						
< 5 km	84 (66.1)	43 (33.9)	1.75 [1.01–3.04]	0.045	1.87 [1.04–3.38]	0.037
≥ 5 km	49 (52.7)	44 (47.3)	1	–	1	–
Time from home to health centre						
≤ 30 min	104 (65)	56 (35)	1.99 [1.09–3.62]	0.025	–	–
> 30 min	29 (48.3)	31 (51.7)	1	–	1	–

financial autonomy. These comments illustrate this:

"Often it is the shortage of products because when they come two or three times to the same SPHC and each time when you are given the prescription and you go to the place to collect the products and you are told that there are certain products that are not there, so they say to themselves like each time they leave and they do not get the medication, they do not see the importance of going to consult again. Often, the shortage of products can cause this." (individual interview, Midwife).

The distance to the health centre, in addition to the lack or unavailability of means of transport were also considered by the actors as a factor that hindered the early seeking of malaria management. Despite advancements in health policy aimed at bringing health centres closer to the community, the distance to health centres remains a significant issue. These statements testify to this:

"It was because it's a bit far that I decided to wait until the next day before coming." (Individual interview, pregnant woman).

"In truth, there is often a distance because they can be very far away, (…). It is often also due to the distance and the means of transport." (individual interview, CBHW).

Discussion

This study showed that an early seeking of malaria management in health centres was influenced by many factors. In our study, 60.5% of pregnant women had an early seeking of malaria management in health centres.

 doi: 10.37432/jieph-d-25-00075

This finding was also supported by qualitative data and consistent with previous reports, in Kaya (Burkina Faso) in 2018, where 62.5% of women had rapid seeking for malaria treatment from all sources [13]. However, this proportion falls short of the WHO recommendations, which urge all women to consult in health centres immediately upon the onset of symptoms [2].

Self-medication significantly hindered early seeking of malaria management in health centres. Many women resorted to using analgesics/antipyretics as first aid before seeking care at the health centre. These results were supported by qualitative findings. This self-medication, stemming from insufficient knowledge about the effects of orally administered drugs, temporarily alleviated symptoms, worsening the disease and delaying women's consultations. Numerous studies in Africa on pregnant women have reported similar instances of self-medication among pregnant women experiencing malaria symptoms [13,15–17].

Delay in decision-making to seek care at health facilities in qualitative interviews hindered early seeking of malaria management in health centres. The decision to seek care was consistently identified as a significant determinant preventing pregnant women from seeking malaria management in health centres early. This may be attributed to the tendency of pregnant women to downplay malaria symptoms and their inability to decide whether to seek appropriate care and when to go for a consultation [18].

The availability of a motorbike in the household significantly hindered early seeking to malaria management. In our study, several households had motorbikes, but in most cases, these motorbikes were not owned by pregnant women. Pregnant women, who have limited access to transport and low autonomy, often wait for their husbands or family members with a motorbike to be available to take them to health centres. This was also supported by the qualitative interviews, which highlighted that the unavailability of transport and lack of family support hindered early seeking. A study in Mali also found the lack of transport to be a determinant of late seeking of antimalarial care [17].

Family/husband financial support was noted as a significant predictor of early seeking of malaria management in health centres. Qualitative data indicated that a lack of family support (accompaniment, financial assistance) and a lack of money hindered this early seeking. A study in Mali highlighted the low involvement of men in the health of their pregnant wives and lack of money as determinants of delayed antimalarial care seeking [17]. These findings suggest that when pregnant women have access to financial resources and support from their husbands, they are more reassured about covering healthcare expenses, which encourages them to seek care promptly. This also implies that efforts to enhance women's financial autonomy could further facilitate this early seeking.

Distance from home to health centres less than five kilometres was a significant predictor of early seeking of malaria management in health centres. Qualitative interviews also mentioned distance to health centres and lack of transportation as barriers to early seeking. These findings align with a study in Mali, which found that distance and lack of transport contributed to delayed antimalarial care-seeking among pregnant women [17]. Similar results have been observed in studies across Africa examining the determinants of antimalarial care-seeking behaviours among pregnant women [13,15,16]. This can be attributed to the fact that when health centres are close to their homes, pregnant women can more readily access care without the need for transportation or accompaniment.

Antimalarial drug shortages during a previous consultation significantly hindered early seeking of malaria management in health centres. Qualitative data also identified drug shortages in health centres as a determinant. Similar findings were noted in a study conducted in Mali [17]. These results, combined with the financial constraints faced by women and the distance to health centres, discouraged pregnant women from seeking malaria management early until they exhibited severe symptoms.

This study has several limitations. First, the reliance on self-reported data may have introduced social desirability and recall biases, potentially resulting in misclassification of early seeking of pregnant women to malaria management in health centres or other variables. However, the involvement of female interviewers and sociologists familiar with the study context likely helped minimise social desirability bias. Second, the sample size may have limited the ability to detect certain associations. Lastly, the cross-sectional design precludes any causal inferences.

Conclusions

Early seeking of malaria management by pregnant women in health centres is not aligned with WHO recommendations. Early seeking of malaria management by pregnant women in health centres is mainly influenced by factors related to the pregnant woman (self-medication, delayed decision-making), sociocultural factors (family support and lack of money), and health system and health access factors (distance to health centres, lack/unavailability of transportation and drug shortages). Therefore, it is essential to the appropriate government authorities strengthen drug availability, empower community-based health systems for education, surveillance, and referral, improve access to health services and transportation, and promote family involvement. These measures will enhance early seeking of malaria management among pregnant women and advance malaria prevention and control efforts.

What is already known about this topic

- In Mali, a qualitative study found the following determinants of late seeking to antimalaria healthcare for children under 5 and pregnant women: determinants linked to financial difficulties, socio-cultural determinants, determinants linked to the functioning of health centres, determinants linked to discomfort and/or side-effects of medications recommended to targets as part of malaria prevention, individuals determinants linked to the nature of the person and determinants linked to geographical obstacles.
- In Kaya, Burkina Faso: 62.5% (20 out of 32) pregnant women sought care from all sources within 24 hours of the onset of fever.

What This Study Adds

- This study will contribute to the literature on early management of malaria in pregnant women, as existing research on this topic is limited.
- This study provided insights into the rate of early care-seeking for malaria treatment among pregnant women in health centres in Boussé, Burkina Faso, revealing a rate of 60.5
- The triangulation of quantitative and qualitative data identified several factors influencing early seeking of pregnant women to malaria management in health centres: family/husband support (financial and accompaniment), lack of money, self-medication, drug shortages (antimalarial and others), distance from the centres less than 5 km and lack/unavailability of means of transport.

Conflict of Interest

The authors of this work declare no competing interests.

Funding

UNICEF/UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases

Acknowledgments

We thank all participants for their willingness to engage in this study, as well as the survey agents involved in data collection. We are also grateful to the UNICEF/UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases for funding this project and supporting our master's training. Our appreciation extends to the staff of the Department of Education and Research in Public Health and Specialities at the University of Science, Technics and Technologies of Bamako in Mali, as well as the Clinical Research Unit of Nanoro in Burkina Faso for the exceptional supervision, training and administrative support. Finally, we would like to thank the head physician of the Boussé health district and his team for creating a conducive environment for conducting this study.

Authors' contributions

Design and implementation of the study protocol: YB. Critical review of study design and tools: TR, KK. Data analysis, results reporting and manuscript drafting: YB. Critical revision of the manuscript: TR, FS, BM, BB, HT, KK. All authors read and approved the final manuscript.

References

[1] World Health Organization. Malaria case management: operations manual [Internet]. Geneva (Switzerland): World Health Organization; 2009 Oct 31 [cited 2026 Jan 7]. 122 p. Available from: https://www.who.int/publications-detail-redirect/9789241598088

[2] Organisation mondiale de la Santé. Mise en œuvre des programmes de paludisme pendant la grossesse dans le contexte des recommandations de l'Organisation mondiale de la Santé concernant les soins prénatals pour que la grossesse soit une expérience positive [Implementation of malaria programs during pregnancy in the context of World Health Organization recommendations on prenatal care to ensure a positive pregnancy experience] [Internet]. Genève (Suisse): Organisation mondiale de la Santé; 2018 Jan [cited 2026 Jan 7]. 7 p. Available from: https://iris.who.int/bitstream/handle/10665/259955/WHO-RHR-18.05-fre.pdf;sequence=1

[3] World Health Organization. World malaria report 2024: addressing inequity in the global malaria response [Internet]. Geneva (Switzerland): World Health Organization; 2024 [cited 2026 Jan 7]. 320 p. Available from: https://iris.who.int/handle/10665/379751

[4] Lawn JE, Blencowe H, Waiswa P, Amouzou A, Mathers C, Hogan D, Flenady V, Frøen JF, Qureshi ZU, Calderwood C, Shiekh S, Jassir FB, You D, McClure EM, Mathai M, Cousens S, Flenady V, Frøen JF, Kinney MV, Bernis L de, Lawn JE, Blencowe H, Heazell A, Leisher SH, Azad K, Rahman A, El-Arifeen S, Day LT, Shah SL, Alam S, Wangdi S, Ilboudo TF, Zhu J, Liang J, Mu Y, Li X, Zhong N, Kyprianou T, Allvee K, Gissler M, Zeitlin J, Bah A, Jawara L, Waiswa P, Lack N, Hernandez F de M, More NS, Nair N, Tripathy P, Kumar R, Newtonraj A, Kaur M, Gupta M, Varghese B, Isakova J, Phiri T, Hall JA, Curteanu A, Manandhar D, Hukkelhoven C, Dijs-Elsinga J, Klungsøyr K, Poppe O, Barros H, Correia S, Tsiklauri S, Cap J, Podmanicka Z, Szamotulska K, Pattison R, Hassan AA, Musafi A, Kujala S, Bergstrom A, Langhoff-Roos J, Lundqvist E, Kadobera D, Costello A, Colbourn T, Fottrell E, Prost A, Osrin D, King C, Neuman M, Hirst J, Rubayet S, Smith L, Manktelow BN, Draper ES. Stillbirths: rates, risk factors, and acceleration towards 2030. Lancet [Internet]. 2016 Feb 6 [cited 2026 Jan 7];387(10018):587–603. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0140673615008375

[5] Desai M, Ter Kuile FO, Nosten F, McGready R, Asamoa K, Brabin B, Newman RD. Epidemiology and burden of malaria in pregnancy. Lancet Infect Dis [Internet]. 2007 Feb 1 [cited 2026 Jan 7];7(2):93–104. Available from: https://linkinghub.elsevier.com/retrieve/pii/S147330990770021X

[6] World Health Organization. WHO guidelines for malaria, 30 November 2024 [Internet]. Geneva (Switzerland): World Health Organization; 2024 Nov 30 [cited 2026 Jan 7]. 462 p. Available from: https://iris.who.int/handle/10665/379635

[7] Johns Hopkins Program for International Education in Gynecology and Obstetrics. Prévention et contrôle du paludisme pendant la grossesse : Manuel de référence, 4em ed [Prevention and control of malaria during pregnancy: Reference manual, 4th ed.] [Internet]. Baltimore (MD): Jhpiego; 2021 [cited 2026 Jan 7]. 108 p. Available from: https://www.alignmnh.org/wp-content/uploads/2021/11/MIP-Reference-Manual_4th-Edition_June-2021_FR.pdf

[8] World Health Organization. A framework for malaria elimination [Internet]. Geneva (Switzerland): World Health Organization; 2017 [cited 2026 Jan 7]. 92 p. Available from: https://iris.who.int/handle/10665/254761

[9] Ministère de la Santé et de l'Hygiène Publique (Burkina Faso). Annuaire statistique 2023 [Statistical Yearbook 2023] [Internet]. Ouagadougou (Burkina Faso): Ministère de la Santé et de l'Hygiène Publique; 2024 Jun [cited 2026 Jan 7]. 420 p. Available from: http://cns.bf/spip.php?id_rubrique=17&page=publdetails

[10] Bicaba F, Browne L, Kadio K, Bila A, Bicaba A, Druetz T. National user fee abolition and health insurance scheme in Burkina Faso: How can they be integrated on the road to universal health coverage without increasing health inequities? J Glob Health [Internet]. 2020 Jun [cited 2026 Jan 7];10(1):010319. doi:10.7189/jogh.10.010319. Available from: http://jogh.org/documents/issue202001/jogh-10-010319.pdf

[11] Ministère de la Santé et de l'Hygiène Publique (Burkina Faso). Profil du Burkina Faso sur le Paludisme [Profile of Burkina Faso on Malaria] [Internet]. Ouagadougou (Burkina Faso): Ministère de la Santé et de l'Hygiène Publique; 2023 Dec [cited 2026 Jan 7]. 74 p. Available from: http://cns.bf/spip.php?id_rubrique=17&page=publdetails

[12] U.S. President's Malaria Initiative. Burkina Faso. Malaria Operational Plan FY 2024 [Internet]. Washington (DC): U.S. President's Malaria Initiative; 2024 [cited 2026 Jan 7]. 56 p. Available from: https://www.pmi.gov/wp-content/uploads/2024/04/FY-2024-Burkina-Faso-MOP.pdf

[13] Kaboré JMT, Siribié M, Hien D, Soulama I, Barry N, Nombré Y, Dianda F, Baguiya A, Tiono AB, Burri C, Tchouatieu AM, Sirima SB. Attitudes, practices, and determinants of community care-seeking behaviours for fever/malaria episodes in the context of the implementation of multiple first-line therapies for uncomplicated malaria in the health district of Kaya, Burkina Faso. Malar J [Internet]. 2022 May 30 [cited 2026 Jan 7];21(1):155. doi:10.1186/s12936-022-04180-z. Available from: https://malariajournal.biomedcentral.com/articles/10.1186/s12936-022-04180-z

[14] Traore O, Ouedraogo A, Compaore M, Nikiema K, Zombre A, Kiendrebeogo M, Blankert B, Duez P. Social perceptions of malaria and diagnostic-driven malaria treatment in Burkina Faso. Heliyon [Internet]. 2021 Jan 4 [cited 2026 Jan 7];7(1):e05553. doi:10.1016/j.heliyon.2020.e05553. Available from: https://linkinghub.elsevier.com/retrieve/pii/S2405844020323963

[15] Hill J, D'Mello-Guyett L, Hoyt J, Van Eijk AM, Ter Kuile FO, Webster J. Women's Access and Provider Practices for the Case Management of Malaria during Pregnancy: A Systematic Review and Meta-Analysis. PLoS Med [Internet]. 2014 Aug 5 [cited 2026 Jan 7];11(8):e1001688. doi:10.1371/journal.pmed.1001688. Available from: https://dx.plos.org/10.1371/journal.pmed.1001688

[16] Chinweuba AU, Agbapuonwu NE, Onyiapat JE, Israel CE, Ilo CI, Arinze JC. Determinants of Malaria Prevention and Treatment Seeking Behaviours of Pregnant Undergraduates Resident in University Hostels, South-East Nigeria. J Pregnancy [Internet]. 2017 Dec 3 [cited 2026 Jan 7];2017:1–9. doi:10.1155/2017/3653874. Available from: https://www.hindawi.com/journals/jp/2017/3653874/

[17] Sibide Y, Coulibaly I. Etude des déterminants du recours tardif aux soins des enfants de moins de 5 ans et des femmes enceintes dans le cadre de la prévention et la prise en charge du paludisme en zone d'intervention au PGIRE en 2019 au Mali : Rapport final [Study of the determinants of delayed access to care for children under five years of age and pregnant women within the framework of malaria prevention and management in the 2019 PGIRE intervention area in Mali: Final report] [Internet]. Bamako (Mali): Centre National d'Appui à la lutte contre la Maladie (Mali); 2019 Jan [cited 2026 Jan 7]. 66 p. Available from: https://cda-omvs.org/14134/

[18] Organisation mondiale de la Santé (Bureau Regional de l'Afrique). Maternité sans risque : améliorer l'accès aux soins obstétricaux d'urgence – table ronde 3 [Safe motherhood: improving access to emergency obstetric care – roundtable 3] [Internet]. Brazzaville (Congo): Organisation mondiale de la Santé (Bureau Regional de l'Afrique); 2003 Jul 3 [cited 2026 Jan 7]. 6 p. Available from: https://www.afro.who.int/sites/default/files/sessions/working_documents/AFR%20RC53%20RT2_0.pdf