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Determinants of Self-Medication in the Management of Severe Malaria in Kamina, DRC

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Research Article

Keywords: Determinant, self-medication, management, severe malaria

Posted Date: September 11th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-10989595/v1

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Additional Declarations: The authors declare no competing interests.

Abstract

Introduction:

Self-medication constitutes a major public health problem, particularly in malaria management in sub-Saharan Africa, where it contributes to treatment delays, complications, and increased mortality associated with severe forms of the disease. This study aimed to determine the prevalence and identify the determinants of self-medication in the management of severe malaria in the Kamina Health Zone.

Methods

This was a cross-sectional analytical study conducted from January 20 to May 20, 2024, among 231 patients who had suffered from severe malaria and had been admitted to Kamina General Referral Hospital, BUMI Referral Health Center, and Bon Berger Polyclinic during the study period. The patient themselves responded when they were able to do so, or their parent/guardian/caregiver when the patient was a minor or unable to respond. Data were collected through face-to-face interviews using a pre-tested questionnaire configured on the Kobotoolbox platform. Statistical analyses were performed using SPSS version 23. Associations were tested using Pearson's Chi-square test or Fisher's exact test, as appropriate. Binary logistic regression was used to identify determinants of self-medication ($P < 0.05$).

Results

The results of this study showed that the prevalence of self-medication in the management of severe malaria in our study setting was 33.3%. The determinants of self-medication in our study setting were: lack of information about the prohibition of self-medication; poor assessment of the quality of care provided at the health facility; lack of education; and low socioeconomic status.

Conclusion

Self-medication in the management of severe malaria remains common in Kamina and is strongly influenced by informational, educational, and socioeconomic factors, as well as by perceptions of the quality of healthcare.

I. INTRODUCTION

Self-medication, defined as the voluntary use of medicines by an individual to treat symptoms that they have self-diagnosed without prior medical advice, is a widespread behavior in many contexts around the world (1). Although this practice may sometimes meet the need for an initial response to minor illnesses, it becomes problematic when applied to potentially serious diseases or when the medicines used are

inappropriate, which may result in adverse effects, delays in appropriate care, drug resistance, and increased morbidity and mortality (2).

Malaria is one of the most important infectious diseases worldwide, particularly in sub-Saharan Africa, where it is endemic and represents a major burden of morbidity and mortality, especially among children under five years of age and pregnant women. According to the World Health Organization (WHO), in 2022, approximately 249 million cases of malaria were estimated worldwide, resulting in more than 600,000 deaths, the majority of which occurred in sub-Saharan Africa (3). In this context, rapid, appropriate, and healthcare professional-guided management is essential to prevent severe complications and fatal outcomes.

However, in many low- and middle-income countries, difficult access to formal healthcare, financial barriers, long distances to health centers, and the availability of medicines without prescriptions have encouraged the use of self-medication as an initial treatment modality for malaria (4). Self-medication in malaria treatment has been documented in numerous African studies. For example, in Nigeria, the prevalence of self-medication for malaria reaches up to 88% in some rural populations (5). A study in Ethiopia showed that nearly 78% of respondents used antimalarial medicines without a medical prescription during febrile episodes suspected to be malaria (6). Similarly, in Cameroon, self-medication accounted for more than 60% of initial responses to malaria among adults surveyed (7). These practices are often associated with limited knowledge of recommended treatment regimens, excessive reliance on previous experiences, and uncontrolled use of medicines available in pharmacies or informal markets (8).

These situations are particularly concerning in cases of severe malaria. By definition, this form involves complications such as severe anemia, impaired consciousness, respiratory failure, or other organ dysfunctions, requiring urgent hospital management (9). Self-medication before hospital admission in this context may mask clinical signs of severity, hinder the rapid recognition of complications, and prolong the interval before appropriate management, thereby increasing the risk of fatal outcomes.

International literature highlights several factors associated with self-medication, including low educational attainment, unfavorable socioeconomic status, dissatisfaction with the quality of health services, and lack of information about the risks associated with self-medication (10).

In the Democratic Republic of the Congo (DRC), although several studies have documented the general prevalence of self-medication in the population, few have specifically analyzed the determinants of self-medication in relation to cases of severe malaria requiring hospital admission (11). The city of Kamina, located in Haut-Lomami Province, represents an example of a setting where the combination of high malaria frequency, constraints on access to healthcare, and community practices involving self-medication may amplify the health risks associated with this practice.

In this context, understanding the factors that motivate and determine the use of self-medication before hospital management of severe malaria is essential for guiding targeted public health interventions.

These interventions could include health education campaigns, strategies to improve the accessibility and quality of healthcare, as well as stricter regulations regarding the sale of medicines without prescriptions. Given this concerning situation, the present study aimed to determine the prevalence and identify the determinants of self-medication in the management of severe malaria in the Kamina Health Zone.

II. MATERIALS AND METHODS

II.1. Study Setting

This study was conducted in the Kamina Health Zone, located within the Haut-Lomami Provincial Health Division in the Democratic Republic of the Congo. The city of Kamina, where the central office of the health zone is located and which is the provincial capital of Haut-Lomami, is a decentralized administrative entity with an estimated population of 366,557 inhabitants distributed across sixteen neighborhoods. The main occupations of the population are subsistence farming and small-scale trading. The main agricultural products are maize, beans, sweet potatoes, peanuts, and others.

II.2. Study Design, Period, Population, and Sample

This was a cross-sectional analytical study conducted between January 20 and May 20, 2024. The study population consisted of all patients with severe malaria admitted to Kamina General Referral Hospital, BUMI Referral Health Center, and Bon Berger Polyclinic. The patient themselves responded when they were able to do so, or their parent/guardian/caregiver when the patient was a minor or unable to respond. Exhaustive recruitment of all cases meeting the eligibility criteria was performed, involving all 231 cases of severe malaria recorded during the study period.

II.3. Data Collection and Statistical Analysis

Data were collected through structured face-to-face interviews with patients suffering from malaria during the study period or their caregivers, using a pre-tested questionnaire configured on the Kobotoolbox server. Self-medication was defined as the use, before admission to a healthcare facility, of a medicine intended to treat malaria symptoms without a prescription or prior medical consultation for the current episode.

After data collection, the data were downloaded in Excel format and analyzed using SPSS version 23. Continuous and categorical variables were expressed as frequencies and proportions. Associations between the dependent and independent variables were tested using Pearson's Chi-square test or Fisher's exact test, as appropriate. Variables with a p-value < 0.20 in the bivariate analysis were entered into the multivariate model. A stepwise binary logistic regression analysis using the Wald stepwise method was performed to identify determinants of self-medication in the treatment of severe malaria, measuring the strength of association for each determinant and adjusting the analyses. Associations with a P-value < 0.05 in the adjusted analyses were considered statistically significant.

II.4. Selection Criteria

The study included all patients who had suffered from severe malaria and had been admitted to Kamina General Referral Hospital, BUMI Referral Health Center, and Bon Berger Polyclinic during the study period. Cases that did not meet the inclusion criterion were not included in the study.

II.5. Ethical Considerations

This study was conducted in accordance with the ethical principles applicable to research involving human subjects and the principles of the Declaration of Helsinki. Prior authorization was obtained from the health authorities and the managers of the health facilities concerned before data collection began. Verbal informed consent was obtained from each participant or, for minor patients or patients unable to respond, from their parent, guardian, or caregiver.

Participation in the study was free and voluntary, and participants could withdraw at any time without any consequences for their care. Data were collected anonymously and treated confidentially. No information allowing the individual identification of participants was included in the manuscript or in the published results.

III. RESULTS

Table I. Distribution of participants according to the prevalence of self-medication and sociodemographic characteristics

Variable	Frequency (%)
Self-medication	
Yes	77 (33.3)
No	154 (66.7)
Age, mean ± standard deviation	**10.2 ± 12.1**
< 5 years	117 (50.6)
≥ 5 years	114 (49.4)
Sex	
Female	100 (43.3)
Male	131 (56.7)
Occupational status	
No occupation	144 (62.3)
With occupation	87 (37.7)
Educational level	
Uneducated (none/primary)	94 (40.7)
Educated (secondary/university)	137 (59.3)
Household size, mean ± standard deviation	**5.1 ± 2.4**
≤ 5 persons	164 (71.0)
> 5 persons	67 (29.0)
Socioeconomic level	
Low	111 (48.1)
High	120 (51.9)

The results of this table showed that the prevalence of self-medication in the study population was 33.3%. The mean age of participants was 10.2 ± 12.1 years, with an almost balanced distribution between subjects younger than 5 years (50.6%) and those aged 5 years and older (49.4%). A male predominance was observed (56.7%). The majority of participants had no profession (62.3%) and had secondary or university education (59.3%). Furthermore, 71.0% came from households with five or fewer persons, and 51.9% belonged to a high socioeconomic level (table I).

Table II. Relationship between self-medication and sociodemographic characteristics

Parameters studied	Self-medication Yes n = 77	Self-medication No n = 154	OR [95% CI]	P
Age				
< 5 years	37	80	0.856 [0.495–1.479]	0.57
≥ 5 years	40	74		
Sex				
Female	31	69	0.830 [0.476–1.446]	0.51
Male	46	85		
Occupational status				
No occupation	43	101	0.664 [0.379–1.161]	0.15
With occupation	34	53		
Educational level				
Uneducated (none/primary)	62	32	15.758 [7.942–31.269]	< 0.001
Educated (secondary/university)	15	122		
Household size				
≤ 5 persons	55	109	1.032 [0.564–1.889]	0.91
> 5 persons	22	45		
Socioeconomic level				
Low	72	39	42.462 [15.992–112.741]	< 0.001
High	5	115		
Duration of illness at home				
≥ 3 days	70	132	1.667 [0.679–4.093]	0.26
< 3 days	7	22		

Reading Table II shows that lack of formal education (none/primary) and low socioeconomic status were statistically associated with self-medication.

Table III. Relationship between self-medication and information about self-medication, information about the prohibition of self-medication, distance between the household and the health facility, waiting time at the health facility, and assessment of the quality of care provided at the health facility

Parameters studied	Self-medication Yes n = 77	Self-medication No n = 154	OR [95% CI]	P
Information about self-medication				
No	26	14	5.098 [2.470–10.521]	< 0.001
Yes	51	140		
Information about the prohibition of self-medication				
No	58	36	10.006 [5.284–18.947]	< 0.001
Yes	19	118		
Distance between household and health facility				
Long	53	122	0.579 [0.312–1.076]	0.08
Short	24	32		
Previous hospitalization of a household member				
Yes	61	132	0.635 [0.312–1.295]	0.21
No	16	22		
Waiting line at the health facility				
Long	20	24	1.901 [0.97–3.715]	0.05
Short	57	130		
Assessment of quality of care provided at the health facility				
Poor	63	12	53.250 [23.309–121.651]	< 0.001
Good	14	142		

Review of Table III shows that the risk of self-medication is very high among subjects who lack information about self-medication, who lack information about the prohibition of self-medication, and who have a poor assessment of the quality of care provided at the health facility.

Table IV. Determinants of self-medication by logistic regression

Determinants of self-medication	B	SE	Wald	Exp(B) [95% CI]	P
Information about the prohibition of self-medication (No vs Yes)	1.346	0.612	4.846	3.84 [1.15–12.80]	0.028
Assessment of quality of care provided at the health facility (Poor vs Good)	2.560	0.622	16.951	12.93 [3.80–43.9]	< 0.001
Educational level (Uneducated vs Educated)	1.527	0.777	3.862	4.60 [1.00–21.31]	0.049
Socioeconomic level (Low vs High)	2.451	0.686	12.762	11.60 [3.02–44.48]	< 0.001
Constant	−3.254	0.747	18.958	0.039	< 0.001

After binary logistic regression, four variables were significantly associated with self-medication. Lack of information about the prohibition of self-medication was associated with 3.84 times higher odds of self-medication than among informed individuals (aOR = 3.84; 95% CI: 1.15–12.80; p = 0.028). Poor assessment of the quality of care provided at the health facility was also associated with a higher probability of self-medication (aOR = 12.93; 95% CI: 3.80–43.99; p < 0.001). Uneducated participants had 4.60 times higher odds of self-medication than educated participants (aOR = 4.60; 95% CI: 1.00–21.31; p = 0.049). Finally, low socioeconomic status was significantly associated with self-medication (aOR = 11.60; 95% CI: 3.02–44.84; p < 0.001).

IV. DISCUSSION

The prevalence of self-medication in the management of severe malaria in our setting was 33.3%, showing that this practice remains a genuine public health problem in the study setting. A comparison with studies conducted in other cities of the Democratic Republic of the Congo shows that, in Kinshasa, a study reported a prevalence of 59.6% among patients admitted to the medical emergency departments of university hospitals, which is higher than ours (12). Also in the DRC, a study conducted at the Kassapa University Campus in Lubumbashi found a frequency of 99% among students (13). In Mali, however, a study conducted in Bamako reported a frequency of 76.5%, which was higher than ours (14).

Generally, self-medication represents a public health problem, with variations in frequency depending on several factors, such as sample size. A higher frequency than ours was observed in Cameroon, where a study conducted in Douala found that 39.7% of respondents sought medicines through self-medication (15). Conversely, in France, the decade-long Health Survey conducted by INSEE in 2002–2003 showed that 20% of individuals had purchased at least one medicine without a prescription, which is lower than our finding (16). This disparity in results could be attributed to the fact that we compared patients from different regions, using different measurement instruments and distinct sampling methods. This prompts us to reflect on the strategies currently in place and their effectiveness.

The present study constitutes a new survey conducted in 2024, two years after the study by Seya et al. Unlike this earlier study, which was conducted in two health facilities among 223 participants, the present study involved 231 cases recorded in three health facilities and aimed to reassess the factors associated with self-medication in a more recent healthcare context.

In our study, we observed that the absence of information about the prohibition of self-medication was strongly associated with the practice of self-medication. This means that people who did not know that self-medication was discouraged or regulated had more than three times the risk of self-medicating compared with those who had been informed. This association reflects a lack of health education that is regularly highlighted in the literature: several studies show that ignorance or limited knowledge of the rules governing the proper use of medicines promotes the spontaneous use of medicines without prescriptions, because individuals rely on their own judgments or social norms rather than on professional clinical assessment (17).

For example, a systematic review indicated that lack of knowledge about the risks and indications of medicines is one of the main determinants of self-medication in many low- and middle-income countries (18).

We also found that poor assessment of the quality of care at the health facility was a factor very strongly associated with self-medication. In other words, people who considered the quality of care received to be unsatisfactory had almost 12 times the risk of resorting to self-medication. This result is consistent with the findings of André SEYA (19) and with a meta-analysis showing that dissatisfaction with health services, including confidence in and perceived quality of care, is significantly associated with increased self-medication practices (18). This dissatisfaction may be related to unmet expectations, excessively long waiting times, or a perception of professional neglect—factors that encourage patients to seek “quick solutions” outside the formal healthcare system.

Another key determinant identified in our study was lack of education among participants, indicating that the absence of schooling or formal education increased the risk of self-medication by more than four times. In both international and national literature, educational level is a well-established factor influencing health behavior (19). A study conducted in Ethiopia reported that illiteracy or low educational attainment was significantly associated with more frequent self-medication, as people with less education often have a limited understanding of medical indications, the risks of misuse, and the need to

consult a healthcare professional (20). This can partly be explained by the fact that formal education improves access to health information, the ability to interpret medical instructions, and confidence in professional advice.

Our study showed that low socioeconomic status was significantly associated with self-medication. People with low socioeconomic status had more than 11 times the risk of resorting to self-medication. This finding is widely supported by the literature: several systematic reviews show that low income, insufficient financial resources, and economic barriers to accessing healthcare are among the main drivers of self-medication, particularly in low- and middle-income countries (21) (19). Indeed, self-medication often becomes an “affordable” alternative for those who cannot afford the direct costs (consultations, examinations) or indirect costs (transportation, loss of income) associated with care at a health facility.

Limitations of the Study

This study has certain limitations. First, its cross-sectional nature does not allow a causal relationship to be established between the factors studied and self-medication. Second, data collected through interviews may be subject to recall bias or social desirability bias. Finally, because the study was conducted in three health facilities in the Kamina Health Zone, the generalization of the results to other settings should be made with caution.

V. CONCLUSION

At the end of this cross-sectional analytical study on the determinants of self-medication in the management of severe malaria, it was found that the prevalence of self-medication in the management of severe malaria in our study setting was 33.3%. Thus, the determinants of self-medication in the study setting were: lack of information about the prohibition of self-medication; poor assessment of the quality of care provided at the health facility; lack of education; and low socioeconomic status.

Declarations

Conflicts of Interest: The authors declare no conflict of interest.

Authors' Contributions

Georges Mwema Ilunga: designed the study and drafted the manuscript.

Ronsard Mutonkole Kelongolwele: designed the data collection tool and analyzed the data.

Adellard Umba Ndolo Kyakutala: contributed to the proofreading of the article and provided scientific guidance.

Béton Kamwanya wa Monga: contributed to the proofreading of the article and provided scientific guidance.

Sylvain Kansongo Ngoy: contributed to the proofreading of the article and provided scientific guidance.

Jean-Claude Banze Kabwe Ilunga: contributed to the revision of the article.

Valentin Masengo Kazadi: contributed to the coordination of the study and proofreading of the article.

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