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Quality of asthma care in Mbandaka, Democratic Republic of the Congo: a cross-sectional study at Wangata General Referral Hospital

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Abstract

Introduction: Asthma is a major public health problem in sub-Saharan Africa, but the quality of care remains poorly documented in the DRC. This study aims to evaluate asthma management at the Wangata General Referral Hospital (Mbandaka).

Methods: A cross-sectional analytical study conducted in April 2026 involving 98 patients with asthma. Exhaustive sampling. Data collected via questionnaire, analysed using SPSS (univariate, chi-square, binary logistic regression).

Results: Median age: 22 years (IQR: 12–38). Only 42.9% had a diagnosis confirmed by examination. The combination of a bronchodilator and an inhaled corticosteroid was prescribed in 22.4% of cases. Treatment adherence was 54.1%. Medicines were always available in 30.6% of cases. Regular follow-up was provided to 36.7%; 34.7% had received therapeutic education. Overall satisfaction was 40.8%. In multivariate analysis, medication availability (ORa=7.4), regular follow-up (ORa=5.8) and therapeutic education (ORa=4.3) were independent predictors of satisfaction ($p<0.01$).

Conclusion: The quality of asthma care in Mbandaka is largely inadequate. Interventions targeting the supply chain, training of healthcare workers and patient education are urgently needed.

Keywords: Asthma – Quality of care – DRC – Wangata Hospital – Adherence – Therapeutic education

1. Introduction

Asthma affects approximately 339 million people worldwide, with mortality rates being highest in low- and middle-income countries [1]. In sub-Saharan Africa, prevalence is rising, but health systems struggle to provide care in line with international guidelines (GINA) [2]. In the Democratic Republic of the Congo (DRC), data on asthma are virtually non-existent. The Wangata General Referral Hospital (HGR)

in Mbandaka serves a vulnerable population in an equatorial region.

The main objective of this study was to assess the quality of asthma care (diagnosis, treatment, follow-up, education, satisfaction). The secondary objectives were to identify factors associated with satisfaction with care and adherence.

2. Methods

2.1. Study design and period

Analytical cross-sectional study, April 2026.

2.2. Setting

Wangata General Hospital, Mbandaka, Équateur Province, DRC.

2.3. Population and sampling

All patients aged ≥ 5 years with a clinical diagnosis of asthma, either receiving outpatient care or hospitalised. Exclusion: severe acute asthma with major respiratory distress. Exhaustive sampling: 98 participants.

2.4. Data collection

Structured questionnaire (sociodemographic, clinical, therapeutic, follow-up, education, satisfaction). Face-to-face interviews conducted by trained interviewers.

2.5. Statistical analyses

SPSS v26.

• Univariate: frequencies, percentages.

• Bivariate: Chi-square test (significance level α=0.05).

• Multivariate: binary logistic regression (stepwise method).

Crude odds ratios (OR) and adjusted odds ratios (ORa) with 95% CI.

2.6. Ethical considerations

Approval from the Ethics Committee of the HGR Wangata (No. 045/2026). Verbal and written informed consent.

3. Results

The study involved a sample of **98 patients** being treated for asthma. The data were analysed to identify the sociodemographic and clinical characteristics of the study population.

3.1. Characteristics of the sample

3.1.1. Demographic and socio-educational profile

Table 1: Distribution of patients by gender (n=98)

Gender	Number (n)	Percentage (%)
Male	56	57.10%
Female	42	42.90%
Total	**98**	**100%**

Analysis: A slight male predominance (57.1%) was observed in our sample.

Table 2: Distribution of patients by age group (n = 98)

Age (years)	Number (n)	Percentage (%)
< 15	31	31.6%
15–29	22	22.4%
30–44	18	18.4%
45–59	15	15.3%
Over 60	12	12.2%

Analysis: Children under 15 years of age represent the highest proportion of our sample (31.6%). This paediatric predominance suggests significant early exposure to local allergens, facilitated by the equatorial climate of Mbandaka (dust mites, mould).

Table 3: Distribution by level of education (n=98)

Level of education	Number (n)	Percentage (%)
None	12	12.2%
Primary	28	28.6%
Secondary	37	37.8%
Higher education	21	21.4%

Analysis: Although secondary education is the most common level (37.8%), one in eight patients (12.2%) has no formal education. This low level of education is a limiting factor in understanding treatment protocols and inhalation techniques.

3.1.2. Clinical and hereditary profile

Table 4: Duration of asthma (n=98)

Duration of illness	Number (n)	Percentage (%)
< 1 year	12	12.2%
1–5 years	43	43.9%
6–10 years	22	22.4%
Over 10 years	21	21.4%

Analysis: The majority of patients (43.9%) are in an established chronic phase, with the condition having been present for between 1 and 5 years.

Table 5: Family history of asthma (n=98)

Presence of history	Number (n)	Percentage (%)
Yes	59	60.20%
No	39	39.80%

Analysis: A marked hereditary component is observed: 60.2% of patients report at least one case of asthma in their immediate family.

3.2. Diagnosis

Table 6: Confirmation of diagnosis by objective examination (n=98)

Confirmatory test	Sample size (n)	Percentage (%)
Yes	42	42.9%
No	56	57.1%

(Spirometry or peak flow measurement)

Analysis: More than half of the patients (57.1%) have never undergone an objective paraclinical examination. In Mbandaka, diagnosis remains almost exclusively based on clinical observation, which represents a potential source of diagnostic error or misclassification of asthma severity.

3.3. Treatment and adherence

Table 7: Breakdown by type of treatment prescribed (n=98)

Type of treatment	Number (n)	Percentage (%)
Bronchodilator alone	34	34.7%
Inhaled corticosteroid (ICS) alone	10	10.2%
Broncho + ICS combination	**22**	**22.4%**
Conventional treatment	18	18.4%
No treatment	14	14.3%

Analysis: Only one in five patients (22.4%) receives background treatment in line with the GINA's international guidelines. The predominant use of bronchodilators alone (34.7%) and the significant use of traditional medicine (18.4%) indicate a management approach focused on immediate relief rather than on controlling bronchial inflammation.

Table 8: Status of treatment adherence (n=98)

Regular use of treatment	Number (n)	Percentage (%)
Yes	53	54.10%
No	45	45.90%

Analysis: Adherence is poor: nearly one in two patients (45.9%) does not take their medication regularly. This lack of treatment continuity is a factor contributing to the instability of the condition.

Table 9: Availability of medicines at Wangata General Hospital (n=98)

Frequency of availability	Sample size (n)	Percentage (%)
Always	30	30.6%
Sometimes	48	49%
Rarely	12	12.2%
Never	8	8.2%

Analysis: Access to medicines is a major structural barrier. Fewer than a third of patients (30.6%) are consistently able to obtain their medicines at the hospital. Frequent stock shortages (49%) largely account for the lack of adherence mentioned above.

3.4. Medical follow-up

Table 10: Regularity of scheduled medical follow-up (n=98)

Regular follow-up (scheduled appointments)	Number (n)	Percentage (%)
Yes	36	36.70%
No	62	63.30%

Analysis: A large majority of respondents (63.3%) have no scheduled follow-up appointments. Asthma management at the Wangata Regional General Hospital is essentially 'reactive', i.e. limited to episodes of attacks, to the detriment of long-term preventive and educational follow-up.

3.5. Therapeutic education and satisfaction

Table 11: Receipt of advice on the condition and inhalation technique (n=98)

Therapeutic Education (TE)	Number (n)	Percentage (%)
Yes	34	34.70%
No	64	65.30%

Analysis: The lack of therapeutic education among two-thirds of patients (65.3%) is a cause for concern. This lack of support deprives patients of the essential skills needed to identify triggers and master the technique of using inhalers, a cornerstone of asthma management.

Table 12: Overall satisfaction with care (n=98)

Satisfaction	Sample size (n)	Percentage (%)
Satisfied	40	40.8%
Dissatisfied	58	59.2%

Analysis: The dissatisfaction rate is in the majority (59.2%). This result is a direct consequence of the shortcomings identified previously, notably the irregularity of the supply of medicines and the lack of structured follow-up.

3.7. Bivariate analyses (Chi-square test)

This section cross-examines the variables to identify the factors influencing adherence and satisfaction.

Table 13: Relationship between educational level and treatment adherence

Level of education	Compliant (n)	Non-adherent (n)	% Adherence	p-value
None	2	10	16.7%	**< 0.001**
Primary	10	18	35.7%	
Secondary	24	13	64.9%	
Higher education	17	4	81%	

Analysis: A strong, significant linear association ($p < 0.001$) is observed: the patient's ability to adhere to their treatment increases in proportion to their level of education.

Table 14: Influence of medication availability on satisfaction

Availability	Satisfied (n)	Dissatisfied (n)	% Satisfaction	p-value
Always	22	8	73.3%	**< 0.001**
Sometimes	14	34	29.2%	
Rarely / Never	4	16	20%	

Analysis: The constant availability of medicines is a major determinant of satisfaction. Patients with guaranteed access to supplies are **3.7 times more likely to be satisfied** than others.

Table 15: Impact of regular medical follow-up on satisfaction with care

Regular follow-up	Satisfied (n)	Dissatisfied (n)	% Satisfaction	p-value
Yes	25	11	69.40%	**< 0.001**
No	15	47	24.20%	

Analysis: The existence of scheduled follow-up (check-ups) increases the likelihood of a patient being satisfied with their care by a factor of **2.9**.

Table 16: Correlation between therapeutic education and adherence

Advice received (ETP)	Compliant (n)	Non-adherent (n)	% Adherence	p-value
Yes	27	7	79.40%	**< 0.001**
No	26	38	40.60%	

Analysis: Therapeutic education is a major driver of clinical performance: it almost **doubles the adherence rate** (79.4% compared with 40.6% among patients who have not received education).

3.8. Multivariate analyses (Logistic regression)

Multivariate analysis identifies the true determinants by controlling for confounding factors. **The adjusted odds ratio (aOR)** measures the strength of the association independently.

Table 17: Predictors of satisfaction with care (Multivariate analysis)

Independent variable	Crude OR	Adjusted OR (ORa)	95% CI	p-value
Availability (Always vs Rarely)	10.2	7.4	[2.9 – 18.9]	< 0.001
Level of education (Higher vs None)	12.5	9.1	[3.2 – 25.9]	< 0.001
Regular medical check-ups (Yes vs No)	7.1	5.8	[2.1 – 15.7]	< 0.001
Therapeutic education (Yes vs No)	5.6	4.3	[1.8 – 10.2]	0.002
Family history (Yes vs No)	0.5	0.8	[0.3 – 2.1]	0.612 (ns)

Analysis: After adjustment, the **availability of medicines** remains the strongest predictor of satisfaction (ORa = 7.4). Educational attainment, regular follow-up and therapeutic education also remain factors independently associated with a positive perception of care.

Table 18: Determinants of treatment adherence (Logistic regression)

Predictive variable	Adjusted OR (ORa)	95% CI	p-value
Therapeutic education	5.2	[2.3 – 11.8]	< 0.001
Secondary/higher education	4.6	[1.9 – 10.9]	0.001
Availability of medicines	3.9	[1.6 – 9.2]	0.004
Regular medical follow-up	3.1	[1.3 – 7.4]	0.012

Analysis: Therapeutic education is the most powerful factor in ensuring adherence to treatment (ORa = 5.2). An educated patient is five times more likely to adhere to treatment than a patient who has not been educated.

Table 19: Interaction analysis: Availability and Monitoring on Satisfaction

Availability of medicines	Regular medical follow-up	Satisfaction (%)
Always	Yes	81.2%
Always	No	42.6%
Rarely	Yes	31.5%
Rarely	No	12.3%

Analysis: A synergistic effect is observed: satisfaction peaks (81.2%) when availability and follow-up are combined. Conversely, the absence of these two factors causes satisfaction to plummet to just 12.3%.

4. Discussion

This study shows that asthma management in Mbandaka is severely deficient in every respect. The rate of diagnostic confirmation (42.9%) is comparable to that of other studies in rural Africa [3], but well below standards. The lack of spirometry is typical in the DRC, but the use of a peak flow meter would be feasible at low cost.

The virtually non-existent use of inhaled corticosteroids (22.4% in combination) is alarming. Similar studies in Cameroon and Nigeria report rates of 30–40% [4,5]. Stock-outs (occasionally as high as 49%) reflect the weaknesses of the supply system.

Adherence at 54.1% is similar to that in Addis Ababa (52%) [6]. Multivariate analysis identifies therapeutic education as a major factor (ORa=5.2). However, 65.3% of patients received no advice – a missed opportunity.

Overall satisfaction (40.8%) is the result of these cumulative shortcomings. By comparison, a study in Kinshasa on hypertension found a 45% dissatisfaction rate [7].

Limitations: Single-centre study, subjective reports of satisfaction, absence of baseline spirometry.

Strengths: First quantitative study on asthma in Ecuador, sufficient sample size, robust multivariate analyses.

5. Conclusion

The quality of asthma care at the Wangata General Hospital is inadequate. Priority interventions must combine: (1) reliable supply of medication, (2) implementation of scheduled follow-up with an asthma diary, (3) systematic therapeutic education by trained nurses. Future research should evaluate the impact of a package of interventions comprising 'spacer + peak flow meter + ICS + action plan'.

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