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Factors limiting access and availability of Breast Cancer medications in two referral hospitals in Douala, Cameroon

Facteurs limitant l'accès et la disponibilité des médicaments contre le cancer du sein dans deux hôpitaux de référence à Douala, Cameroun

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RESUME

Background: Breast cancer claims the lives of thousands of families worldwide and particularly in Cameroon each year. Access to anticancer drugs is often hindered by factors that remain undescribed. This study aimed to identify the barriers to access and availability of breast cancer drugs in two referral hospitals in Douala.
Methods: A cross-sectional study was conducted over six months in the oncology departments of the Douala General Hospital and Laquintinie Hospital. A total of 249 women with breast cancer were included. Data collected encompassed sociodemographic characteristics, financial information, administered treatments, as well as the cost and availability of medications. Analysis was performed using R software and binary logistic regression to identify key factors hindering access to and availability of anticancer drugs.
Results: The mean age of the patients was 48 ± 12 years. Ninety-one percent of the medications were available, and 71% were accessible. Factors limiting the availability and accessibility of medications included stockouts (OR = 4.3; p = 0.001), family financial burden (OR = 3.44; p = 0.03), monthly income (OR = 7.20; p = 0.005), lack of health insurance (OR = 6.21; p = 0.001), and financing medications through loans (OR = 8.23; p = 0.04).
Conclusion: Our findings underscore the need to strengthen supply chain infrastructure, promote financial assistance systems, and develop health policies aimed at improving equitable access to anticancer treatments.

ABSTRACT

Introduction : Le cancer du sein cause chaque année la mort de milliers de personnes au Cameroun. Le but de l'étude était d'identifier les obstacles à l'accès et à la disponibilité des médicaments contre le cancer du sein à Douala.
Méthodes : Une étude transversale a été réalisée sur une période de six mois dans les services d'oncologie de l'Hôpital Général de Douala et de l'Hôpital Laquintinie. Au total, 249 femmes atteintes de cancer du sein ont été incluses. Les données recueillies comprenaient les caractéristiques sociodémographiques, les informations financières, les traitements administrés, le coût et la disponibilité des médicaments. L'analyse a été effectuée à l'aide du logiciel R et d'une régression logistique binaire.
Résultats : L'âge moyen des patientes était de 48 ± 12 ans. Quatre-vingt-onze pour cent des médicaments étaient disponibles, et 71% étaient accessibles. Les facteurs limitant la disponibilité et l'accessibilité des médicaments incluaient les ruptures de stock (OR = 4,3 ; p = 0,001), la charge financière familiale (OR = 3,44 ; p = 0,03), le revenu mensuel (OR = 7,20 ; p = 0,005), l'absence d'assurance santé (OR = 6,21 ; p = 0,001), et le financement des médicaments par emprunt (OR = 8,23 ; p = 0,04).
Conclusion : Il est nécessaire de renforcer les infrastructures de la chaîne d'approvisionnement, de promouvoir des systèmes d'aide financière, et de développer des politiques de santé visant à améliorer l'accès équitable aux traitements anticancéreux.

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Introduction

Breast cancer is a malignant tumor that develops from breast cells, primarily the ducts or lobules. It is the most common cancer among women, with significant global incidence. According to the World Health Organization (WHO), approximately 2.3 million new cases of breast cancer were diagnosed worldwide in 2020, making it the leading cause of cancer-related deaths among women, with 685,000 deaths recorded in the same year (1). In Africa, breast cancer is also predominant, accounting for a substantial proportion of new cancer cases among women. In Cameroon, 20,745 new cancer cases were diagnosed in 2020, with more than 13,199 deaths. Breast cancer ranked first in terms of incidence (4,170 new cases diagnosed in 2020) and mortality (2,108 deaths recorded during the same year) (2). The management of breast cancer relies on a multidisciplinary approach, including surgery, radiotherapy, chemotherapy, hormone therapy, and targeted therapies. Chemotherapy, in particular, plays a crucial role in treating advanced or metastatic forms of the disease, aiming to destroy cancer cells spread throughout the body (3). However, in Africa, and specifically in Cameroon, access to breast cancer treatments faces multiple barriers. High medication costs, frequent stockouts, insufficient healthcare infrastructure, and a lack of adequate financial support are significant obstacles. In Douala, referral hospitals such as the Douala General Hospital and Laquintinie Hospital struggle to meet the growing demand, exacerbating inequalities in cancer patient care(2).

The aim of this study was to analyze the factors limiting access to and availability of anticancer drugs for breast cancer treatment in the oncology departments of Douala General Hospital and Laquintinie Hospital, with the goal of proposing recommendations to improve patient care and reduce inequalities in healthcare access.

Materials and Methods

A cross-sectional study was conducted over six months, from March to September 2024, in the oncology departments of Douala General Hospital and Laquintinie Hospital, two referral centers for cancer treatment in the Littoral region of Cameroon. These facilities provide multidisciplinary care, including specialized consultations, chemotherapy, radiotherapy, and palliative care. The study included 249 histologically confirmed breast cancer patients receiving chemotherapy in these departments. Data on sociodemographic characteristics (age, sex, marital status, education level, profession, monthly income), therapeutic details (prescribed medication type), medication availability (whether medications were out of stock or not), and accessibility (medication cost and financial arrangements for purchase) were collected using a survey form, patient records in the departments, and data from pharmacies in Douala.

The data were entered into an Excel spreadsheet (Microsoft Office, USA) and imported into R software for analysis. Qualitative data were presented as frequencies and percentages, while numerical data were expressed as mean ± standard deviation. The Mann- Whitney non-parametric test and Pearson's Chi-square test of independence with Fisher's extraction were used for comparisons. Binomial logistic regression was used to identify factors limiting the availability and access to breast cancer treatment medications in the sample.

Results

Socio-demographic data

Table I presents the sociodemographic characteristics of the patients included in the study, comparing those from Douala General Hospital (DGH) and Laquintinie Hospital (LH).

The average age of patients was 48±12 years, with an average monthly income of 39,639±60,419 CFA francs, with no significant difference between the two hospitals (p=0.6 and p=0.7, respectively).
The average duration of treatment was slightly higher at LH (11±7 months) compared to DGH (9±10 months), although this difference was not significant (p=0.094).
Regarding marital status, 52% of the patients were married, with similar proportions between the two hospitals. In terms of education level, a significantly higher proportion of patients with secondary education was observed at LH (80%) compared to DGH (46%) (p<0.001).
Finally, for occupations, the informal and public sectors predominated in both hospitals, with a slightly statistically significant difference between the distributions of professions (p=0.03) (**Table I**).

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Table I: *sociodemographic characteristics of patients according to hospitals (Douala General Hospital and Laquintinie Hospital)*

Sociodemographic Factors	Overall (N= 249)	HGD (N = 200)	HLD (N = 49)	P-value
Mean age ± SD (years)	48±12	48±12	47±10	0.6
Monthly income (CFA)	39.639±60.419	40.375±62.769	36.633±50.150	0.7
Treatment duration (months)	10±10	9±10	11±7	0.094
Marital status				0,7
Married	52% (130/249)	53% (106/200)	49% (24/49)	
Single	32% (80/249)	31% (61/200)	39% (19/49)	
Widowed	15% (37/249)	16% (31/200)	12% (6/49)	
Divorced	0.8% (2/249)	1.0% (2/200)	0% (0/49)	
Education Levels				<0.001***
Secondary	52% (130/249)	46% (91/200)	80% (39/49)	
Higher	24% (59/249)	27% (54/200)	10% (5/49)	
Primary	21% (52/249)	24% (47/200)	10% (5/49)	
Illiterate	3.2% (8/249)	4.0% (8/200)	0% (0/49)	
Occupational Sectors				0.03*
Informal sector	71. 8%(180/249)	72. 5% (145/200)	71. 4%(35/49)	
Freelance sector	10%(26/249)	10. 5%(21/200)	10. 2%(5/49)	
Private sector	8. 4 (21/249)	8. 5%(17/200)	8. 2%(4/49)	
Public sector	8. 8 (22/249)	9%(18/200)	8. 2%(4/49)	

HDL: Douala General Hospital, HLD: Laquintinie Hospital of Douala. Data were presented as frequencies (N, n), percentages (%), and mean ± standard deviation. P-value: The t-test and Chi-square test with Fisher's extraction were performed to compare the different parameters between the hospitals.

Distribution of medications used in Breast Cancer treatment in our departments

Table II highlights the diversity of medications used to treat breast cancer, with a predominance of paclitaxel (29%), followed by cyclophosphamide (23%) and doxorubicin (21%). Treatments such as carboplatin and trastuzumab are also common, while other medications like docetaxel, gemcitabine, and fluorouracil are less frequently prescribed, reflecting a varied approach tailored to the patients' needs.

Availability and accessibility of Breast cancer medications in our sample

Table III assesses the availability and accessibility of breast cancer treatment medications in the two hospitals (Douala General Hospital - DGH and Laquintinie Hospital of Douala - LHD). Regarding medication availability, 91% of patients overall reported that medications were available, with similar proportions at DGH (91%) and LHD (90%), showing no statistically significant difference (p=0.8).

Table II: *Distribution of medications used in breast cancer treatment.*

Breast Cancer Medications	*n(%)*
Paclitaxel	118 (29%)
Cyclophosphmide	92 (23%)
Doxorubicin	87 (21%)
Carboplatin	37 (9.1%)
Trastuzumab	17 (4.2%)
Capecitabine	8 (2.0%)
Docetaxel	7 (1.7%)
Gemcitabine	7 (1.7%)
Vinorelbine	7 (1.7%)
Epirubicin	6 (1.5%)
Anastrozole	5 (1.2%)
Goserelin	4 (1.0%)
Ribociclib	3 (0.7%)
Fluorouracil	2 (0.5%)
Lapatinib	2 (0.5%)
Tamoxifen	2 (0.5%)
Docetaxel	1 (0.2%)
Fulvestrant	1 (0.2%)
Gemcitabine	1 (0.2%)
Ifosfamide	1 (0.2%)

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Table III: availability and accessibility of breast cancer medications in our sample.

Overall (N = 249)			HGD (N = 200)		HLD (N = 49)		
Availability Parameters	**N**	**%**	**n**	**%**	**n**	**%**	**P-value**
Medication Availability							
Yes	225	91	181	91	44	90	**0.8**
No	22	8.9	17	8.6	5	10	
Medication Accessibility							
No	177	71	137	69	40	82	**0.08**
Yes	72	29	63	32	9	18	

HGD: Douala General Hospital; HLD: Laquintinie Hospital of Douala. Data are presented as frequencies (N, n) and percentages (%).P-value: Pearson's Chi-square test of independence with Fisher's extraction was used to compare the availability parameter categories, with statistical significance set at p<0.05.

In terms of medication accessibility, 71% of patients overall reported difficulties accessing medications, with a higher proportion at LHD (82%) compared to DGH (69%). However, this difference was marginally non-significant (p=0.08). These results highlight that while medications are generally available, their accessibility remains a challenge, particularly at Laquintinie Hospital.actors limiting access and availability of Breast Cancer treatment medications

Table IV: *binomial logistic regression*

Factors	OR	IC 95%	p-value
Family Burden			
No	-	-	-
Yes	2.44	(0.43, 16.06)	0.03
Marital status			
Married	-	-	-
Single	1.92	(0.42, 9.68)	0.411
Divorced	1.88	(0.50, 7.38)	0.352
Widowed	1.44	(0.19, 13.72)	0.737
Monthly income	7.70	(1.91, 30.77)	0.001
Stock shortages			
No	-	-	-
Yes	4.3	(1.02, 12.15)	0.001
Health insurance			
Yes	-	-	-
No	6.21	(1.31, 27.80)	0.005
Source of medication funding			
Family	-	-	-
Insurance	1.02	(0.12, 10.21)	0.986
Loan	8.23	(1.27, 91.29)	0.045
Personal	2.27	(0.51, 10.85)	0.286

The main factors limiting access to and availability of breast cancer medications include family burden (OR = 2.44, 95% CI: 0.43–16.06, p = 0.03), stock shortages (OR = 4.3, 95% CI: 1.02–12.15, p = 0.001), and the lack of health insurance (OR = 6.21, 95% CI: 1.31–27.80, p = 0.005). Resorting to loans to finance medications is also a major barrier (OR = 8.23, 95% CI: 1.27– 91.29, p = 0.045), highlighting the economic constraints faced by patients.

Conversely, factors such as marital status and other financing methods, like personal or insurance-based financing, showed no significant association with access to treatment. These findings underline the impact of financial and logistical constraints and the lack of medical coverage on access to essential medications for breast cancer treatment (**Table IV**).

Discussion

Breast cancer is the leading cause of cancer-related mortality among women worldwide, with a particularly concerning impact in resource-limited countries such as Cameroon. In Douala, an economically significant city, referral hospitals face major challenges regarding access to and availability of essential medications for breast cancer treatment. Despite medical advancements, many patients encounter financial, logistical, and structural obstacles that compromise their care. These challenges include stock shortages, high treatment costs, lack of insurance coverage, and socio-economic constraints such as family burden and low income. However, few studies have explored the specific factors limiting access to breast cancer treatment in this region. This study aims to identify and analyze these barriers in two referral hospitals in Douala to provide evidence-based data that can influence health policies and improve care for breast cancer patients.

This study highlights significant challenges related to access to and availability of breast cancer medications in two referral hospitals in Douala, Cameroon. With a medication availability rate of 91% and accessibility of 71%, the findings show that while efforts have been made to improve medication availability, persistent obstacles limit accessibility for many patients.

Stock shortages (OR = 4.3; p = 0.001) were identified as a major limiting factor. This reflects

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structural weaknesses in the medication supply chain, a problem previously highlighted in other studies in Cameroon. Kemfang *et al.* reported that frequent interruptions in the supply of cancer medications compromise continuity of care and increase treatment delays, worsening therapeutic outcomes for patients (4). This issue is also confirmed by research in other African countries, such as Ethiopia, where Gebremedhin *et al.* attributed these shortages to logistical inefficiencies and funding issues (5). Family burden (OR = 3.44; p = 0.03) was another significant obstacle. Essiben *et al.* showed that family responsibilities increase the financial burden and limit women's ability to prioritize their own health (6). This aligns with international studies, such as Brouwer *et al.,* which also demonstrated that domestic responsibilities play a crucial role in healthcare access (7).

The lack of health insurance (OR = 6.21; p = 0.001) emerged as a critical factor limiting access to medications. In Cameroon, Mapoko *et al.* found that the absence of medical coverage is associated with significantly reduced access to oncology treatments, exacerbating health inequities (8). This finding is consistent with observations by Onoka *et al.* in Nigeria, who reported that uninsured patients are more likely to forgo care due to prohibitive costs (9). Monthly income (OR = 7.20; p = 0.005) was also identified as a major determinant of medication access. Engbang *et al.* demonstrated that low-income patients in Cameroon are often unable to complete treatment due to the high costs of medications and consultations (10). These results are similar to those of Zelle *et al.* in sub-Saharan Africa, where low income predicted an inability to access care (11).

Finally, reliance on loans to finance medications (OR = 8.23; p = 0.04) reflects the severe economic constraints patients face. Ndom *et al.* reported that financing through loans exposes households to increased precarity and limits treatment adherence (12), a finding also supported by Kimani *et al.* in Kenya (13). These findings highlight the urgent need to implement public policies aimed at strengthening medication supply chains, establishing universal health insurance coverage, and developing financial support mechanisms. Such measures could significantly improve access to breast cancer treatments and reduce healthcare inequities in Cameroon.

Conclusion

This study underscores significant challenges limiting access to and availability of breast cancer medications in the oncology departments of two referral hospitals in Douala. Despite relatively high medication availability (91%), accessibility remains limited (71%), primarily due to factors such as stock shortages, family burden, low income, lack of health insurance, and reliance on loans for financing. These results emphasize the importance of strengthening supply chain infrastructure, promoting financial assistance mechanisms, and implementing policies that ensure equitable access to cancer treatments.

Study Strengths

In-depth contextual analysis: This study provides specific data within a local context, allowing for the identification of unique challenges in Douala's hospitals. Use of robust statistical tools: The methodological approach, based on binomial logistic regression, accurately identified key determinants. Policy recommendations: The results offer concrete pathways for guiding public health policies and improving access to treatment.

Study Limitations

Limited geographic scope: The study focuses only on two hospitals in Douala, which may not reflect the situation in other regions of Cameroon.

Perspectives

Expanded studies: Extend the analysis to other regions and include a larger sample of patients to obtain a national perspective. Complementary qualitative approach: Incorporate interviews with patients and caregivers to better understand perceptions and challenges related to medication access. Evaluation of interventions: Design and evaluate pilot interventions, such as subsidy systems or adapted health insurance models, to test their effectiveness in improving access. Health policy reinforcement: Collaborate with policymakers to integrate findings into national strategic planning for cancer control.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

Ethical Approval and Consent to Participate

This study was conducted in accordance with guidelines for clinical research involving human subjects, as outlined by the Ministry of Public Health of Cameroon.

Conflict of Interest: The authors declare no conflicts of interest.

Authors' Contributions

AND and AD **conceptualized the idea and study.** AND, NY, NMNK and DBE **collected and entered field data**. AD and YJ supervised data collection in the hospitals. AND and NMNK **coordinated data entry, created figures, performed statistical analyses, and interpreted the results** with the help of DBE. AND **drafted the manuscript** with support from DBE, AD, and YJ. Authors BBE, AD, MMEBAM and PN **reviewed the document to enhance its intellectual content**. YJ, AD and PN **supervised the work at all stages**. All authors read and approved the final manuscript before submission.

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