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Socio-economic inequalities in access to information before cancers diagnosis. The case of women with breast cancer in Mali

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Research Article

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Abstract

Background

Breast cancer is a major public health problem worldwide and its incidence is growing rapidly particularly in Sub-Saharan Africa. Prevention is a crucial issue in many sub-Saharan African countries where healthcare access is limited such as in Mali (Western Africa). While access to information about the disease has been pointed out as an important determinant of breast cancer screening and care pathway, little evidence exists about this point in Mali.

Methods

Using a mixed methods approach combining quantitative and qualitative data collected in the SENOVIE Mali project, this study aimed to analyse access to information about breast cancer by women diagnosed with breast cancer in Mali. Bivariable analyses and multivariable logistic regressions models were performed to analyse quantitative data collected among 274 women enrolled between 2023 and 2024 in five hospitals in Bamako. Thematic analyses were applied to two qualitative datasets: semi-structured interviews with 25 women conducted between 2021 and 2022 and with 29 stakeholders conducted between 2024 and 2025 in Bamako.

Results

We find that 60.2% of women surveyed have had access to information about breast cancer before their diagnosis. Those who had access to information were mostly from socioeconomically advantageous populations in terms of level of education, occupations, possession of a television and place of origin. Most of the participants had access to information through the media (63%) and their relatives (29.1%). Qualitative data revealed the key roles of healthcare professional and family members in access to information.

Conclusions

This study is one of the rare research documenting women access to information about breast cancer in Mali and highlighting the socioeconomic and geographic inequalities underlighting this major prevention issue. Our findings highlighted the urgent need for improving access to information in Mali by strengthening and diversifying prevention efforts – especially among less-educated populations, those living outside of Bamako, and socioeconomically disadvantaged populations.

Background

Breast cancer is a major public health problem worldwide. In 2022, 2.3 million women were diagnosed with breast cancer and 685,684 deaths were recorded around the world [1]. The burden of breast cancer varies considerably according to geographical area with the highest incidence rate observed in France (105 cases per 100,000 females) and Australia/New Zealand (100,3 cases per 100,000 females) and the

lowest in middle Africa with 26,7 cases per 100,000 females [1]. In Africa, 198,553 new cases and 91,252 deaths were documented in 2022 [1]. Although the incidence rates of breast cancer in sub-Saharan Africa (SSA) are among the lowest – partly due to the lack of high-quality cancer registries covering all populations [2] –, it is rising rapidly [3] and is projected to double by 2040 [4, 5] due to factors such as rapid population growth and ageing, changes in fertility patterns [4], changes in lifestyles and comorbidities (obesity, sedentary lifestyle, alcohol consumption, etc.) [5–7]. Furthermore, breast cancer mortality is disproportionately greater than the corresponding incidence in many SSA countries. For example, the second highest mortality rate worldwide was observed in Western Africa with 22.6 per 100,000 while the incidence rate was 42.1 cases per 100,000 [1]. These disproportionate mortality can be explained by several factors such as limited access to screening – particularly mammography – late stage at diagnoses, scarcity of specialised health professional, and weak health infrastructure to deal with breast cancer [8–12].

In 2021, WHO established the Global Breast Cancer Initiative with the shared goal of reducing breast cancer mortality by 2.5% per annum, which translates to the saving of 2.5 million lives within 2 decades [13]. One way to achieve the objective of this initiative is by improving access to screening, as a study conducted in Norway has shown that screening is associated with a reduction in breast cancer mortality, contributing to about one-third of the total reduction in breast cancer deaths [14].

Thus, to facilitate access to breast cancer screening, studies have shown that access to information about breast cancer (risk factor, sign and symptoms, preventive measures, screening methods and treatment) is an important step since women who are aware about breast cancer are more likely to undergo screening [15–17] and make lifestyle changes to reduce their risk of cancer [18]. Access to information is also an important part of an effective cancer prevention program as it can contribute to early detection and increase the chances for successful treatment and cure of the disease [19, 20]. However, studies carried out in SSA have shown varying results, but a lot of them emphasise that women have limited knowledge about breast cancer [21–26].

The low level of awareness about breast cancer is a significant public health challenge which exacerbates existing inequalities among women exposed to or affected by the disease. Most of the studies highlighted that access to information about breast cancer is influenced by women's socio-economic position, including education, occupation, income, household characteristics (head of household sex, education, income, etc.) and geographical location [22, 25, 27]. Women in an advantaged socio-economic position are more likely to be aware of breast cancer. In the same way, studies have also highlighted that the sources of information vary from one population to another, and generally involve the media as a whole, including radio, television, newspapers and the internet, as well as healthcare professionals, friends and family [25, 28]. Access to information is an important issue that needs to be better documented, particularly in countries where access to breast cancer healthcare is a major concern, as in Mali [9].

Mali, a Sahelian country in Western Africa, is a country with a low human development index - HDI (0.428 in 2021) [29]. Mali had a population of 22.4 million in 2022, 69.6% of whom lived in rural areas. Mali is characterised by the youth of its population, with almost half (47.2%) aged under 15. Women accounted for half the population (49.7%). The country's capital, Bamako, had 4,227,569 inhabitants in the same year, corresponding to 18.9% of the total population [30]. The country is facing several challenges, including political challenges (political crisis since 2012) and social and health challenges.

Among these social and health challenges, breast cancer has been a crucial issue over the past years, as the country has seen an increase in the number of cases of breast cancer [3, 31]. In 2019, breast cancer accounted for 19% (294/1545) of new cases of cancer recorded in the district of Bamako [32]. In Mali, women affected by breast cancer are particularly young [33], and the majority are diagnosed at a very advanced stage of the disease [34, 35]. It has been shown that 34% of women were diagnosed at a metastatic stage, with a 5-year survival rate of 37% [36].

Among the factors that explain late diagnosis and poor survival rates, studies have highlighted, among other things, low awareness of the disease among women and communities [35, 37, 38]. Even though knowledge of the disease has been identified as a determining factor, we found only one quantitative study in Mali estimating the level of knowledge of the disease among women: it showed that only 20% (13/64) of women knew about breast cancer self-examination [35]. Based on the evidence that few studies have been carried out in Mali on women's access to information on breast cancer, this article aims to study access to information about breast cancer by women in Mali using cross-sectional quantitative and qualitative data collected in the SENOVIE project.

Methods

Study setting

The SENOVIE Mali study is part of the multi-country research project SENOVIE - Therapeutic mobility and breast cancer. The SENOVIE Mali study is being carried out in five hospitals in the capital Bamako: the Centre hospitalo-universitaire (CHU) du Point G; the Hôpital Mère-Enfant Luxembourg; the CHU Gabriel Touré; the Hôpital du Mali and the Forum Medical clinic. These hospitals are the main cancer treatment facilities in Mali.

This study was carried out with the hospitals' members to produce evidence-based data to enable the Ministry of Health to make decisions. The study is being conducted by a multidisciplinary team comprising researchers from the social and medical sciences. Given the limited knowledge about the situation of women living with breast cancer in Mali, this study aims to document various aspects of breast cancer care in Mali. Thus, the objective of SENOVIE Mali is to document the sociodemographic and medical profiles of women with breast cancer in Mali, to evaluate the costs of treatment, to analyse their therapeutic mobility, and finally to document the physical and sociopsychological experiences of

these women. In order to meet these objectives, a mixed methodology study - quantitative and qualitative - was conducted.

Quantitative data collection and analysis

Recruitment and data collection

Between 25 September 2023 and 25 October 2024, we enrolled women aged 18 years or older who had received a diagnosis of breast cancer within the preceding 12 months at one of the five participating hospitals. Eligible participants were those undergoing treatment in the oncology, surgery, gynecology, or radiotherapy departments, who were deemed physically and cognitively capable of completing a face-to-face interview, and who provided voluntary informed consent to participate in the study. The data was collected by 4 interviewers recruited for the study, a doctoral student in economics and 8 medical students. All data collectors were recruited and trained in September 2023. In addition to the study presentation and theoretical training, questionnaires were pre-tested in three study hospitals.

Women were identified during consultation or in medical records. The medical students referred the identified women to the interviewers. The interviewers and medical students completed the recruitment questionnaire and the medical questionnaire with a tablet or a mobile phone using the KoboCollect software. At the CHU Gabriel Touré, women were recruited in the surgery and gynecology-obstetrics departments. At the CHU du Point G, recruitment was carried out in the onco-haematology, surgery A and B, gynaecology-obstetrics departments and in the Médecins sans Frontières liaison unit. At the CHU Mère-Enfant Luxembourg, recruitment began in the oncology department and then continued at the Clinique du Forum Médical following the head of department's move there. At the Mali hospital, the thoracic surgery, gynaecology and radiotherapy departments had been identified for recruiting women.

During the first months of data collection, four weekly meetings were held from 27/10 to 17/11/2023 with the interviewers and medical students to ensure that the data collection was running smoothly and to check the data sent to the server. Any difficulties encountered during data collection were discussed, along with solutions for resolving them. The quality of the data was regularly checked and feedback was given in case of problems.

Data analysis

Outcome variables

The main outcome of this research concerns access to information by the women surveyed in the SENOVIE Mali project. For this study, the question was formulated as follows: “Did you have any information about cancer before being diagnosed with the disease?” Response modalities were No and Yes. A second question was then asked to those who answered yes to the question above. It aimed to document the primary source of access to information and was worded as follows: “If yes, by whom first?” 1 = media (TV, radio), 2 = social networks, 3 = friends, 4 = family, 5 = association, 6 = doctors, 99 =

others, 99.1. Specify others. Respondents could only give one answer. For the analysis in this article, an initial coding was carried out for the descriptive analysis and includes the following categories: media (TV, radio, social networks), relatives (friends, family, association), healthcare professionals and others. Given the size of the sample and the objectives of the analysis, a second binary variable was coded: media vs. other sources of information. The questionnaire was administered in French and Bambara, a local language spoken by 57.8% of the Malian population [30].

Covariates

The Covariates used in this study are mainly based on the socio-demographic characteristics of the women surveyed. Variables included were selected based on the published literature [15, 19, 24, 25, 27]. The following variables were included: age group in years (under 40, 40–49, 50 and over), level of formal education (no education, basic, secondary or higher), occupational status (housewife, employed/retired, informal employment), marital status (not/no longer in union, in monogamous union, in polygamous union), region of origin (Bamako, other towns), sex of the household head (male, female), level of education of the household head (none, basic, secondary or higher), occupational status of the household head (housewife/househusband, employed/retired, informal employment), has a television in the household (yes, no), has a radio in the household (yes, no), has a mobile phone in the household (yes, no), household size (1–5 members, 6–10 members, 11–15 members, 16 + members), the number of household members who work and contribute to household expenses (none, one member, two or more members), awareness of any cases of breast cancer in the family (yes, no) as well as the household wealth tertile, divided into three categories (poor, middle class, and rich). This variable was constructed based on the material assets owned by the respondents' households.

Statistical analysis

Participants’ sociodemographic characteristics were described using proportions. Descriptive analyses were conducted for access to information and sources of information, with corresponding 95% confidence intervals (CIs). Access to information was analysed in relation to participants’ characteristics using Fisher’s exact test, stratified by whether participants had access to information or not. A similar analysis was performed to explore associations between participants’ characteristics and the sources through which they accessed information, whether through media or other sources. Variables that were significantly associated with the outcomes ($p < 0.20$) in the bivariate analysis were included in multivariable logistic regression models. A backward stepwise selection procedure was applied to identify the most parsimonious models with optimal predictive performance, as determined by minimisation of the Akaike Information Criterion (AIC) [39]. Models were compared using ANOVA test. This test showed that there were no significant differences between the initial model and the final model. The final models retained for each outcome were those demonstrating the best overall properties. All analyses were performed using RStudio (R version 4.5). The gtsummary [40] and ggplot2 [41] packages were used for data summarisation and visualisation, respectively. Quantitative analysis followed the STROBE guidelines (Strengthening the Reporting of Observational Studies in Epidemiology) statement [42] (supplementary files, appendix 1).

Qualitative data collection and analysis

Qualitative data were collected from two distinct fieldworks, generated in different contexts but both within the framework of the Senovie research project .The first dataset consisted of interviews with women living with breast cancer in Bamako (01/11/2021–14/04/2022). The second dataset consisted of interviews with diverse stakeholders involved in breast cancer prevention, care, advocacy, and research (16/04/2024–08/07/2025).The qualitative approach adopted follows the scientific criteria of COREQ qualitative research (COnsolidated criteria for REporting Qualitative research) [43] (supplementary files, appendix 2).

The first corpus explored the care pathways and embodied experiences of women living with breast cancer in Bamako. Two researchers collected the qualitative data: a Malian health anthropologist and lecturer at the University of Medicine in Bamako, who has extensive experience of conducting interviews on sensitive subjects such as illness, gender and sexuality; a French sociologist who has been conducting research with health workers and women in Mali for the past 10 years and was also trained as a midwife and worked in West Africa.

A total of 25 interviews were conducted with women with breast cancer, identified through two cancer associations (n = 20) and doctors (n = 5). Upon request from the researchers, the leader of the women's breast cancer associations suggested patients to be interviewed. Since breast cancer is a sensitive topic in Mali, the association leaders' involvement was crucial and made it easier to make contact and reduced the risk of mistrust from patients. Appointments with patients were negotiated by telephone. The interviews were carried out at the patients' homes (n = 20) or in the health services after the patients' medical appointments (n = 5). Data collected was audio-recorded and transcribed. Researchers shared the same interview grid (supplementary files, appendix 3) and the first interviews were conducted together to ensure everyone had the same understanding of the questions.

The interviews made it possible to describe the women's care pathways (the first signs of illness, seeking care, information received, etc.) and their relationship with their bodies, as well as their representations of “femininity” - i.e. “the relationship to oneself, to others and to the world that is mediated by the sexed body” [44]. The median duration of the interviews was 70 minutes. The data analysis approach was based on thematic analysis [45]. Manual coding was carried out.

A second corpus of qualitative data forms part of a prospective analysis aimed at informing the development of a knowledge transfer mechanism on breast cancer, which is being led by patient associations in Mali. Twenty-nine semi-structured interviews were conducted with a broad range of stakeholders, including leaders and members of patient associations, representatives of Non-Governmental Organisations (NGO), a journalist, policymakers and public health officials, as well as health professionals-researchers.

Participants were identified through the technical and scientific committees of the SENOVIE project and by the networks of the research team. The interviews were conducted by a bi-national French-Malian

public health researcher who has been working for several years on knowledge transfer in Mali. Interviews took place in French and in settings chosen by participants (association offices, health facilities, workplaces, or homes). The interviews were audio-recorded with participants' consent, and when they did not wish to be recorded, detailed notes were taken. All materials were transcribed and anonymized.

The interview guide explored perceptions and practices of knowledge production and circulation, the role of patient associations in advocacy and decision-making, and the opportunities and challenges for implementing a structured knowledge transfer mechanism in the Malian health system. Although women's access to information before diagnosis was not a central theme of this investigation, several interviews provided complementary insights on this issue, which were included in the analysis. The interviews also yielded useful perspectives on governmental actions in cancer control and on the ways in which the media address – or fail to address – breast cancer, which were integrated into the analysis.

Ethical considerations

The SENOVIE Mali study protocol was submitted to, evaluated and approved by the ethics committee of the Institut National de Santé Publique (Bamako, Mali) on 26 October 2021 under No. 17/2021 /CE-INSP. All participants gave their written consent to take part in the study.

Results

Participants characteristics

Quantitative survey participants: young women with low levels of education and from disadvantaged social backgrounds

A total of 275 women were recruited. One woman was misdiagnosed and ultimately excluded from the sample. The study therefore involved 274 women. Table 1 shows that slightly more than a quarter of the women surveyed were aged under 40 (27%) and 32.5% were aged between 40 and 49 with a median age at the survey of 46 (IQR: 38–56). Almost half of the participants had no formal education (47%). The majority of respondents were housewives (52.2%) or worked in the informal sector (26.6%). They were mostly in unions, either monogamous (36.1%) or polygamous (36.5%) (Table 1).

One in two women was from towns other than Bamako (51.5%), and the majority was from male-headed households (85.8%). Heads of household were more likely to have no formal education (42.5%), or to have secondary or higher education (39.6%). A similar trend was observed in terms of occupational status: the heads of household were either formally employed or retired (41.2%) or informally employed (48.1%). Women surveyed came from households with between 6 and 10 members (47.6%) and with a

television (77.7%) or radio (57.3%). In terms of breast cancer, the majority of women were not aware of any cases of breast cancer in their family (85%) (Table 1).

Table 1
Characteristics of participants enrolled in the study

Characteristic	**N = 274[1]**
Age in years	
under 40	27.0% (74/274)
40–49	32.5% (89/274)
50 and over	40.5% (111/274)
Age (median)	46 (38–56)
Level of formal education	
no education	47.0% (127/270)
basic	25.6% (69/270)
secondary or higher	27.4% (74/270)
missing	4
Occupational status	
housewife	52.2% (143/274)
employed/retired	21.2% (58/274)
informal employment	26.6% (73/274)
Marital status	
not/no longer in union	27.4% (75/274)
in monogamous union	36.1% (99/274)
in polygamous union	36.5% (100/274)
Region of origin	
Bamako	48.5% (133/274)
other towns	51.5% (141/274)
Sex of the household head	
male	85.8% (235/274)
female	14.2% (39/274)
Level of education of the household head	

[1]% (n/N) ; Median (Q1, Q3)

Characteristic	N = 274[1]
no education	42.5% (116/273)
basic	17.9% (49/273)
secondary or higher	39.6% (108/273)
Missing	1
Occupational status of the household head	
housewife/househusband	10.7% (28/262)
employed/retired	41.2% (108/262)
informal employment	48.1% (126/262)
missing	12
Has a radio in the household?	
no	42.7% (117/274)
yes	57.3% (157/274)
Has a television in the household ?	
no	22.3% (61/274)
yes	77.7% (213/274)
Has a mobile phone in the household ?	
no	3.3% (9/274)
yes	96.7% (265/274)
Household size	
1–5 members	26.4% (72/273)
6–10 members	47.6% (130/273)
11–15 members	16.5% (45/273)
16 + members	9.5% (26/273)
missing	1
Household members who work and contribute to household expenses	
none	11.8% (32/272)
one member	44.9% (122/272)

[1]% (n/N) ; Median (Q1, Q3)

Characteristic	N = 274[1]
two or more members	43.4% (118/272)
missing	2
Household wealth tertile	
lowest	33,6% (92/274)
middle	33,2% (91/274)
highest	33,2% (91/274)
Awareness of any cases of breast cancer in the family	
no	85.0% (233/274)
yes	15.0% (41/274)
[1]% (n/N) ; Median (Q1, Q3)	

Qualitative survey participants

For the first corpus, the study population comprised women of varying ages and socio-economic backgrounds. The women were aged between 30 and 70, had a variety of backgrounds (housewives, doctors), all lived in Bamako but came from different regions of Mali and different ethnic groups. All women were married and had between 1 and 9 children, except one who was single and without children.

Participants included in the second corpus were actors from the breast cancer ecosystem in Mali, such as patient association leaders (5), other civil society organisations and NGO representatives (8), policymakers (6), health professionals-researchers (4), research institutions (5), a media professional and an international institution’s expert on non-communicable diseases. Interviews were conducted in Bamako and the diversity of participants' institutional affiliations and professional and personal backgrounds allowed for complementary perspectives on knowledge transfer on breast cancer, both at the community and policy levels.

Access to cancer information before being diagnosed with the disease

Among women surveyed, our findings show that 60.2% [95% CI: 54%-66%] had received information about cancer before being diagnosed with the disease (Table 2). Of these patients who had received information about cancer, 63% [55%-70%] had received this information primarily through the media (radio, television, social networks); 29.1% [22%-37%] through their relatives and only 6.1% [3%-11%] had obtained information from healthcare professionals.

Table 2
Information about cancer before the disease and the primary source of access to information

	N = 274[1]	**95% CI**
Had information about cancer before being diagnosed with the disease		
no	39.8% (109/274)	34%-46%
yes	60.2% (165/274)	54%-66%
	N = 165[1]	**95% CI**
Primary source of access to information among those who had access to it		
media	63.0% (104/165)	55%-70%
relatives	29.1% (48/165)	22%-37%
healthcare professionals	6.1% (10/165)	3.1%-11%
others	1.8% (3/165)	0.47%-5.6%
Abbreviation: CI = Confidence Interval		
[1]% (n/N)		

The qualitative data also showed that a number of patients received information through the media, in particular by watching certain television or radio programmes, in which some patients have heard some healthcare professionals they knew. This is illustrated by the verbatim below:

“Because people inform us about it and I listen to the programmes every Thursday afternoon on TM2 [a television channel] where they talk about this disease and on Wednesdays another channel does the same programme. I found out about all this through TV programmes.” (Rokia, 60 years old)

“Yes, on TV I saw Dr A talking about it, and I even told him that I had seen him on television talking about cancer, and that day I prayed that God would spare everyone from this disease.” (Lakaré, 46 years old).

Close or distant relatives were also a source of access to information. Some women said that they had heard about breast cancer through having seen or lived with people with the disease in their family or during their studies:

Arabi, 33 years old, noted that: “Yes, for a long time, when I was in fifth grade, our teacher had cancer and her breast was amputated, but she continued to teach her classes”.

Socio-economic background influence on access to information about cancer before being diagnosed with the disease

Table 3-A shows that women who had received information about cancer before being diagnosed were more likely to come from advantaged socio-economic backgrounds (Table 3-A). In fact, 78.4% of those with a secondary or higher level of formal education had received information about cancer before the disease, compared with 47.2% of those with no formal education ($p < 0.001$). This trend was also observed in terms of occupational status, where 82.8% of salaried or retired women had received information compared with 52.4% of housewives and 57.5% of women in informal employment ($p < 0.001$). Social variation in access to information before the disease is also determined by the characteristics of the women's households, particularly those of the head of household. It was found that 73.1% of women from households where the head of household had a secondary education or higher had received information about cancer prior to the disease. In comparison, this was the case for only 45.7% of patients from households where the head of household had no formal education ($p < 0.001$). This result is also consolidated by the occupational status of the head of household: 71.3% of women from households where the head of household is a salaried or retired person had significantly received information about cancer before the disease, compared with 64.3% of women from households where the head of household is a househusband or housewife or a person who holds an informal employment (49.2%, $p = 0.002$) - (Table 3-A).

We also found that 67.6% of women who had a television in their household had received information about cancer before their illness, compared with 34.4% of those who did not have a television in their household ($p < 0.001$). Geographical region of origin also plays a role in access to information: 69.2% of patients from Bamako had information about cancer before the disease compared with 51.8% of patients from other towns, and this was significant ($p = 0.004$). Finally, the proportion of women who had information before the disease was higher among those who were aware of cases of breast cancer in their family (73.2% vs. 57.9% among women who were not aware of any cases of cancer in their family; $p = 0.083$), although only slightly significant (Table 3-A).

In parallel to quantitative data, qualitative data suggested that knowledge of cases of breast cancer among relatives can have an impact on belief in the existence of the disease and improve recognition of symptoms. This point was explained by some participants :

“My grandmother—my mother’s mother—had cancer; before her death, one of her breasts was amputated, and the other was covered in wounds and was also amputated. It was then that I believed in it, although I had already heard of cervical cancer and had even been screened for it.” (Bébé, 37 years old).

“I can talk about breast cancer because I have lived closely with women who have had breast cancer; I know the symptoms” (Lakaré, 46 years old).

Qualitative data further indicate that some participants were from family in which they had relatives with medical background. Those participants explained how relatives with medical background helped them significantly, over time, to learn about the disease and its management. As one of the respondents, Koro, 61 years old, described it: “My father was a doctor, so I understood the disease better than he [my husband] did and accepted the surgery much more quickly.”.

Table 3
Characteristics of women according to whether or not they had access to information about cancer before being diagnosed with cancer (A) and according to the primary source of access to information about cancer (B).

	A- Access to information			**B- Access to information primarily through the medias**		
Characteristic	yes N = 165/274[1]	95% CI	p-value[2]	medias N = 104/165[1]	95% CI	p-value[2]
Age in years			0.5			0.4
under 40	64.9% (48/74)	53%, 75%		66.7% (32/48)	51%, 79%	
40–49	61.8% (55/89)	51%, 72%		67.3% (37/55)	53%, 79%	
50 and over	55.9% (62/111)	46%, 65%		56.5% (35/62)	43%, 69%	
Level of formal education			< 0.001			0.10
no education	47.2% (60/127)	38%, 56%		53.3% (32/60)	40%, 66%	
basic	62.3% (43/69)	50%, 73%		65.1% (28/43)	49%, 79%	
secondary or higher	78.4% (58/74)	67%, 87%		72.4% (42/58)	59%, 83%	
missing	4			2		
Occupational status			< 0.001			0.7
housewife	52.4% (75/143)	44%, 61%		65.3% (49/75)	53%, 76%	
employed/retired	82.8% (48/58)	70%, 91%		64.6% (31/48)	49%, 77%	
informal employment	57.5% (42/73)	45%, 69%		57.1% (24/42)	41%, 72%	
Marital status			0.6			0.020
not/no longer in union	62.7% (47/75)	51%, 73%		46.8% (22/47)	32%, 62%	

[2] Fisher's exact test

	A- Access to information			B- Access to information primarily through the medias		
in monogamous union	62.6% (62/99)	52%, 72%		71.0% (44/62)	58%, 81%	
in polygamous union	56.0% (56/100)	46%, 66%		67.9% (38/56)	54%, 79%	
Region of origin			0.004			0.054
Bamako	69.2% (92/133)	60%, 77%		69.6% (64/92)	59%, 79%	
other towns	51.8% (73/141)	43%, 60%		54.8% (40/73)	43%, 66%	
Sex of the household head			0.5			0.007
male	59.1% (139/235)	53%, 65%		67.6% (94/139)	59%, 75%	
female	66.7% (26/39)	50%, 80%		38.5% (10/26)	21%, 59%	
Level of education of the household head			< 0.001			0.043
no education	45.7% (53/116)	36%, 55%		49.1% (26/53)	35%, 63%	
basic	67.3% (33/49)	52%, 80%		69.7% (23/33)	51%, 84%	
secondary or higher	73.1% (79/108)	64%, 81%		69.6% (55/79)	58%, 79%	
missing	-			-		
Occupational status of the household head			0.002			0.060
housewife/househusband	64.3% (18/28)	44%, 81%		50.0% (9/18)	29%, 71%	
employed/retired	71.3% (77/108)	62%, 79%		72.7% (56/77)	61%, 82%	
informal employment	49.2% (62/126)	40%, 58%		56.5% (35/62)	43%, 69%	
missing	8			4		
Has a radio in the household?			> 0.9			0.5

[2] Fisher's exact test

	A- Access to information			B- Access to information primarily through the medias		
no	60.7% (71/117)	51%, 69%		66.2% (47/71)	54%, 77%	
yes	59.9% (94/157)	52%, 68%		60.6% (57/94)	50%, 70%	
Has a television in the household ?			< 0.001			0.3
no	34.4% (21/61)	23%, 48%		52.4% (11/21)	30%, 74%	
yes	67.6% (144/213)	61%, 74%		64.6% (93/144)	56%, 72%	
Has a mobile phone in the household ?			0.5			0.14
no	44.4% (4/9)	15%, 77%		25.0% (1/4)	1.3%, 78%	
yes	60.8% (161/265)	55%, 67%		64.0% (103/161)	56%, 71%	
Household size			0.4			> 0.9
1–5 members	61.1% (44/72)	49%, 72%		63.6% (28/44)	48%, 77%	
6–10 members	63.8% (83/130)	55%, 72%		65.1% (54/83)	54%, 75%	
11–15 members	48.9% (22/45)	34%, 64%		59.1% (13/22)	37%, 79%	
16 + members	57.7% (15/26)	37%, 76%		60.0% (9/15)	33%, 83%	
missing	1			-		
Number of household members who work and contribute to household expenses			0.3			0.023
none	68.8% (22/32)	50%, 83%		36.4% (8/22)	18%, 59%	
one member	55.7% (68/122)	46%, 65%		66.2% (45/68)	54%, 77%	
two or more members	62.7% (74/118)	53%, 71%		68.9% (51/74)	57%, 79%	
missing	1			-		

[2] Fisher’s exact test

	A- Access to information			B- Access to information primarily through the medias		
Household wealth tertile			< 0.001			< 0.004
lowest	42,4% (39/92)	32%, 53%		46,2% (18/39)	30%, 63%	
middle	63,7% (58/91)	53%, 73%		58,6% (34/58)	45%, 71%	
highest	74,7% (68/91)	64%, 83%		76,5% (52/68)	64%, 86%	
Awareness of any cases of breast cancer in the family			0.083			< 0.001
no	57.9% (135/233)	51%, 64%		71.1% (96/135)	63%, 78%	
yes	73.2% (30/41)	57%, 85%		26.7% (8/30)	13%, 46%	
Abbreviation: CI = Confidence Interval						
[1]% (n/N)						
[2] Fisher's exact test						

Contribution of the social and family environment in accessing information through the media

The social and family context has a significant influence on access to information primarily through the media (Table 3-B). Women in union were significantly more likely to have had access to information through the media, with differences depending on the type of union: 71% of women in monogamous unions and 67.9% of patients in polygamous unions received information through the media compared with 46.8% of patients who were not or no longer in a union at the time of the survey (p = 0.020). We also noted that 67.6% of women from households headed by men had received information via the media, compared with 38.5% of women from households headed by women (p = 0.007). The influence of the head of household can also be seen in terms of his or her level of education, as around 70% of women from households where the head of household had been to school (whatever the level) received information via the media, compared with 49.1% of women from households where the head of household had no formal education (p = 0.043). In the family context, it should also be noted that women who were not aware of any cases of breast cancer in their family more often had access to information primarily via the media, compared to those who were aware of cases of cancer in their family (71.1% vs 26.7%, p < 0.001) - (Table 3-B).

We found that 72.4% of women with a secondary or higher level of formal education were inclined to receive information through the media, compared with only 53.3% of people with no formal education (p = 0.10). Place of residence also appears to be a determining factor, insofar as 69.6% of women from Bamako had access to information about cancer before the disease through the media. This proportion was lower among patients from other regions of the country (54.8%, p = 0.054) - (Table 3-B).

The qualitative data suggested that access to information through the media is a lever not only for access to general information but also for seeking care for diagnosis. Some patients stressed that the nature of the information they received through the media and the healthcare professional sharing the information was a determining factor in their willingness to seek care when they had suspicions about their own breast cancer diagnosis. Awa's words, 56 years old, are particularly relevant in this sense: “My cancer was diagnosed in 2015, but it wasn’t until late 2020 that I began treatment because I didn’t believe it… It didn’t bother me at all—no pain or discomfort—and from 2019 I noticed it had grown a bit and sometimes I felt tingling but no pain. One day, by chance, I saw Professor B’s show on Weekend 70 on TV. The following week I went to Gabriel Touré Hospital. I had the test and they told me to get a biopsy. And it was positive.”.

Factors influencing access to information about cancer prior to the disease and access through the medias

The results of the logistic regression models suggest that women who were formally employed or retired were more likely to have had information about cancer before the disease (aOR = 3.2 [1.4–7.6]; p = 0.006) compared to housewives (Fig. 1- A). Women who reported having a television in their household (aOR = 3.5 [1.8–6.9]; p < 0.001) as well as those who were aware of cases of cancer in their family (aOR = 2.5 [1.1–6.1]; p = 0.032) had a significantly higher probability of having had information before the disease, compared with women who did not have a television in their household and those who were not aware of cases of cancer in their family. Women from other towns, outside Bamako, were significantly less likely to have access to information before the disease (aOR = 0.5 [0.3–0.9], p = 0.032) (Fig. 1- A).

In terms of access to information through the media, women with secondary or higher levels of formal education were more likely to have access to information through the media (aOR = 2.8[1.1–7.5], p = 0.039) than women with no formal education. Women from female-headed households (aOR = 0.2 [0.0-0.6], p = 0.007) and those who knew about cancer cases in their family (aOR = 0.1 [0.0-0.3]; p < 0.001) were significantly less likely to have had information about cancer through the media (Fig. 1- B).

Discussion

We examined access to information about breast cancer from women diagnosed with the disease in four publics Malian hospitals and one private hospital. We were first able to highlight the proportion of women who had access to information about breast cancer before being affected by the disease. We also showed that a significant proportion of women had access to information through the media (radio, television and social networks) and also through their relatives, similarly to what has been observed in

other studies [46–48] including a systematic review [28]. Finally, we found that the type of information obtained varied, and that the people providing the information, whether in the media or outside, were sometimes experts known by women. We also found that this access to information influences the women's therapeutic pathways.

Socio-economic and geographical inequalities in access to breast cancer information

The study showed that the women diagnosed were young, with a median age of 46 years old at the time of the survey. Given that some women surveyed had been diagnosed in the 12 months prior to the survey, we can therefore emphasise that these women were diagnosed young, at similar ages to those observed in other studies carried out in Mali [34, 35] and in other sub-Saharan African countries [34]. Among the women surveyed, we found that only 60.2% had received information about cancer prior to the disease. Comparing this result with studies from Mali or other sub-Saharan African countries is challenging, as differences in indicators, their scope, and the populations studied across contexts may have influenced the levels of access to information. Despite these limitations, access to information in the other studies carried out in Mali was lower compared with the SENOVIE study (60.2% vs. 20% [35]). This difference may relate to the nature of the data collected – general information in our study versus breast self-examination in Grosse Frie's et al. – as well as to differences in study settings (single hospital vs multiple hospitals). It may also reflect changes in the cancer-control context in Mali between 2016 and 2022, particularly the establishment of the association Les Combattantes du Cancer in 2016. This association runs numerous awareness campaigns and is supported by Médecins Sans Frontières (MSF), which established a programme to fight female cancers in Mali in 2018 [9]. In 2020, MSF joined forces with the Week-End 70 (WE 70) programme (2016–2022) [49], to promote awareness of breast cancer and screening via the Pink October campaign. In addition, Malian health authorities have strengthened awareness and screening initiatives since 2022, notably through National Office for Reproductive Health (ONASR) led partnerships with associations and national campaigns, including the integration of breast and cervical cancer screening into family planning programs in 2023. These reasons could also explain that access to information in our study appeared either higher [15, 23] or lower [21, 26] than what was observed in other sub-Saharan African countries.

Our analyses highlighted significant inequalities based on the characteristics of the surveyed women. Women who had access to information were more often from higher socio-economic populations indicated by the fact that they were more often salaried or retired, had a television in their household and lived in Bamako, which elements are markers of higher economic status [50]. Similar results have been observed in studies conducted in other countries, both in Sub-Saharan Africa [22, 23, 51, 52] and beyond [48, 53, 54]. Studies have shown that socio-economic status and geographical proximity to healthcare services can facilitate contact with healthcare professionals and expose to health prevention campaign and medical information [55]. In Mali, breast cancer diagnosis and treatment is mainly available in Bamako [9]. This could explain why women living outside Bamako had less access to information.

Research has also revealed that television constitutes an important source of access to information [22, 23, 51]. However, media – particularly television – may disseminate information primarily accessible to more educated populations and urban residents, owing to the language level and use of standardised medical terminology. This could thus explain why access to information through the media concern women with a higher level of education, as also shown elsewhere [51, 56].

Information providers and the nature of the information received by women

Our quantitative and qualitative results highlighted significant issues regarding information providers and the nature of the information received. Regarding information providers, healthcare professionals were regularly mentioned. Qualitative findings indicate that information received from the media is mainly delivered by medical doctors, highlighting the strong involvement of healthcare professionals in breast cancer prevention and management in Mali, which may explain women's trust in healthcare providers reported in other studies [9]. Another information providers are associations. During Pink October – the flagship breast cancer awareness period – members of associations appear in the media to discuss breast cancer issues. For example, in 2024, the association Les Combattantes du Cancer featured in ten television programs and ten radio broadcasts during that period, sometimes alongside a healthcare professional (Information from the 2024 activity report of Combattantes du Cancer, consulted by the research team). Beyond these media appearances, associations were infrequently cited as pre-diagnostic information sources, possibly because healthcare professionals are perceived as more legitimate and thus more salient.

A key finding of our study is the role of family members and relatives in disseminating breast cancer information. Respondents referred both to medically trained relatives – often men – and to family members or friends with personal experience of the disease. This contribution of close relatives, support our quantitative findings and align with previous evidence on the central role of family members in the cancer care pathway [57, 58]. The higher probability of women with close relatives with personal experience of the disease to report having pre-diagnostic information, as also reported in other study [25], highlights two important elements. First, having cases of breast cancer in one's surroundings can be a source of information. Even though this information could be incomplete, as it focused on limited aspects of symptoms (e.g., breast ulceration) and treatment (e.g., breast amputation), it appeared that exposure to others' illness experiences or media information facilitated early care-seeking behaviours. However, this point needs to be nuanced. Breast cancer remains a "taboo" in Mali due to limited knowledge of the disease and stigmatization faced by affected women [9]. Consequently, women may choose to hide their disease, even to family members. In cases where the diagnosis is shared, information conveyed by relatives could also provoke fear and stigmatisation. Such reactions can influence women's perception of breast cancer, hinder their willingness to undergo breast cancer screening. These results are consistent with previous research [57, 59–61].

In addition, if the relative affected by breast cancer has passed away – as it is the case of lot of women concerned by this disease in Mali [62], this can negatively impact women ability to accept the disease, the treatment adherence among newly diagnosed women because the information they could have may be limited to the dramatic link that breast cancer equals death [60]. This is particularly relevant given that women informed by friends or family were less educated and more likely to live outside Bamako than those informed through the media, potentially limiting their health literacy and their ability to assess information reliability and distinguish cancer from death.

Addressing the breast cancer health literacy gap in Mali: implications for policy and future research

Our results suggested that 39.8% of the surveyed women had had no pre-diagnostic knowledge of the disease, revealing a low level of health literacy related to breast cancer. Health literacy is defined here as the “personal, cognitive and social skills which determine the ability of individuals to gain access to, understand, and use information to promote and maintain good health” [63]. According to Don Nutbeam, access to information is a central public health goal that need to be address at the population level to be more effective and avoid inequities [63]. Our findings, however, suggest that breast cancer awareness campaigns implemented in Mali may have benefited socio-economically privileged populations. This raises concerns about the inclusivity of such campaigns. It also suggests that cancer prevention efforts targeting the general population may be either insufficient – in terms of geographic coverage – or ineffective, due to various factors such as language barriers, inappropriate targeting, the use of inadequate communication channels, or limited frequency of information dissemination. This situation highlights the need for coordinated action and funding’s at both policy and research levels.

At the policy level, it appears essential to implement measures aimed at ensuring that all segments of the population in Mali have access to information about breast cancer. This is important since studies have shown that access to information reduces delays in seeking care by reducing both the lack of knowledge about breast cancer symptoms and the anxiety linked to a potential diagnosis [35, 64] and promotes earlier diagnosis [65]. As suggested by others studies [52, 64], diversifying the channels used to disseminate prevention messages – through community outreach beyond Bamako to address geographic disparities, messages in multiple local languages, regular awareness campaigns rather than only during Pink October – could be implemented. Moreover, it appears relevant to provide populations with comprehensive information on all aspects of breast cancer: diagnostic methods, various symptoms, risk factors, access to care, and available treatment options [64, 66]. Such transparency could be important in addressing the fear associated with the disease and the stigma experienced by those affected.

At the research level, future studies could also explore interventions aimed at improving breast cancer awareness, following the example of work conducted in other contexts suggesting that short interventions have the potential to enhance women's knowledge about cancer [66]. There is also a need

for large-scale surveys – or the inclusion of cancer and care pathway data in existing surveys – to strengthen scientific knowledge, as such data remain scarce [67].

Strengths and limitations

This study has some limitations. First, it included only women attending consultations during the survey period, most of whom had been diagnosed within the previous 12 months; thus, undiagnosed women, those diagnosed earlier, or those lost to follow-up or deceased were not captured. Population-based surveys would be needed to address this limitation. Second, interviews conducted post-diagnosis may be subject to recall bias regarding access to information before diagnosis, potentially leading to an overestimation of prior knowledge. Third, comparability with other studies in Mali or sub-Saharan Africa is limited by heterogeneity in indicators and study populations, underscoring the need for harmonised research measures.

Despite these limitations, this study provides valuable insights. It is among the few in Mali to examine access to information prior to breast cancer diagnosis, contributing to future research and prevention strategies. The mixed-methods design enabled nuanced analyses, highlighting the ambivalent role of relatives in information transmission, the nature of information received, and the central role of oncologists in facilitating both media- and interpersonal-based access to information – an aspect not previously documented, to our knowledge.

Conclusions

In Mali, access to breast cancer care is highly limited. This study has shown that this limitation also include prevention, particularly women's access to information before the disease diagnosis. Many women had received no information about the disease prior to being affected. Thus, this study bring light on a major public health challenge that need to be addressed. Given the rising incidence rate of breast cancer cases in Mali, there is a urgent need to improve access to information by strengthening and diversifying prevention efforts – especially among less-educated populations, those living outside of Bamako, and socioeconomically disadvantaged populations.

Abbreviations

AIC
Akaike Information Criterion
ANOVA
Analysis of Variance
aOR
Adjusted Odds-Ratio
CE
Ethics Committee

CHU
University Hospital Centre
CI
Confidence interval
COREQ
Consolidated criteria for Reporting Qualitative research
HDI
Human Development Index
INSP
National Institute of Public Health
MSF
Médecins Sans Frontières / Doctors Without Borders
NGO
Non-Governmental Organisations
ONASR
National Office for Reproductive Health
SSA
Sub-Saharan Africa
STROBE
Strengthening the Reporting of Observational Studies in Epidemiology
TV
Television
WHO
World Health Organization

Declarations

Competing interests :

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MSF contributed to the revision and approval of the manuscript. The others sponsors had no role in the design or conduct of the study, in the collection, analysis, or interpretation of data, nor in the manuscript's preparation, review, or approval.

Ethics approval and consent to participate:

The study is conducted in accordance with the Declaration of Helsinki. The SENOVIE Mali study protocol was evaluated and approved by the ethics committee of the Institut National de Santé Publique (Bamako, Mali) on 26 October 2021 under No. 17/2021 /CE-INSP.

Consent for publication:

Not applicable.

Availability of data and material:

All relevant data are within the manuscript and its supplementary information. Detailed individual data cannot be made publicly available due to the sensitive nature of the information they contain and in accordance with ethical agreements. However, they can be made available upon reasonable request to the corresponding author.

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Figures

Figure 1: Factors associated with access to information about cancer before the disease (A) and access through the media (B)

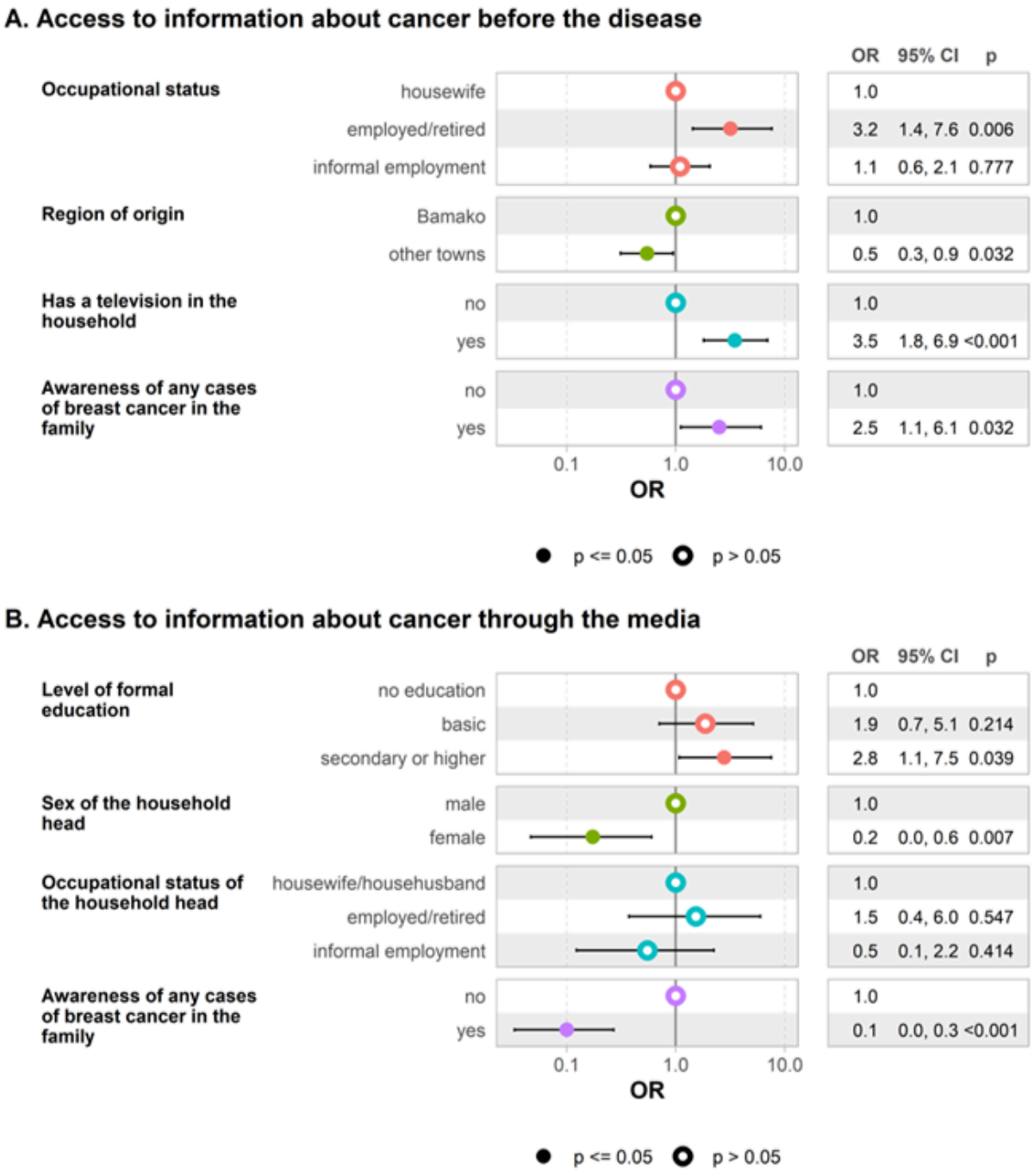


Figure 1

See image above for figure legend.

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