

# Breast cancer: Factors influencing late-stage presentation at the Mankweng Hospital breast cancer clinic, Polokwane, Limpopo Province, South Africa

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**Background.** Female breast cancer remains the most common cancer in many parts of the world. According to GLOBOCAN (2021), female breast cancer has become the most commonly diagnosed cancer, surpassing lung cancer. Women in low- and middle-income countries are reported to seek medical help at an advanced stage of the disease, which negatively affects the prognosis, irrespective of the care available.

**Objectives.** To determine factors influencing late-stage diagnosis of breast cancer in women at the specialist breast cancer clinic at Mankweng Hospital in Polokwane, Limpopo Province, South Africa.

**Methods.** The study was conducted at the Mankweng breast cancer clinic in the rural province of Limpopo over the 18-month period July 2020 - December 2021 and applied a quasi-experimental design to determine the stage of breast cancer at the time of presentation to the clinic, and factors influencing late-stage presentation.

**Results.** Of the study sample, 269 patients were female (98%) and 5 male (2%). The majority of the females ( $n=203$ ; 75%) had late-stage cancer at presentation, only 66 (25%) being in the early stages.

**Conclusion.** Most of the patients (76%) presented with late-stage disease. The main reason for the delay was lack of knowledge about breast cancer and its symptoms (not painful, not considered serious). Of concern is the higher proportion of educated patients presenting with late-stage disease compared with the group with a lower level of education.

*S Afr Med J* 2022;112(11b):906-910. <https://doi.org/10.7196/SAMJ.2022.v112i11b.16834>

Female breast cancer remains the most common cancer in many parts of the world.<sup>[1,2]</sup> According to GLOBOCAN (2021),<sup>[3]</sup> breast cancer has become the most commonly diagnosed cancer, surpassing lung cancer. Estimates of its incidence increased from 2.1 to 2.3 million new cases over the period from 2018 to 2020, with the incidence continuing to be highest in developed countries. Breast cancer has a very good prognosis in comparison with many other types of cancer, with an 84 - 89% survival rate at 5 years reported in high-income countries. However, in low- and middle-income countries (LMICs), the majority of women diagnosed with breast cancer succumb to the disease. Women in LMICs have a 17% higher mortality rate compared with women in affluent countries<sup>[3]</sup> and are reported often to seek medical help only at an advanced stage of the disease, which negatively affects the prognosis irrespective of the care available.<sup>[4]</sup>

Factors influencing delay in seeking medical help after initial discovery of symptoms have been studied in urban breast centres in South Africa (SA).<sup>[4,5]</sup> The contributing factors reported in the literature include lack of knowledge about breast cancer and its symptoms, low levels of education, negative attitudes towards breast cancer symptoms, fear of cancer treatment, poverty, traditional healers' beliefs, spiritual beliefs and need to care for others.<sup>[5-7]</sup>

A study of the barriers to early presentation of breast cancer among women in Soweto, Johannesburg, showed that limited education and lack of breast cancer knowledge and awareness as well as health system inefficiencies were associated with an advanced stage at diagnosis.<sup>[8]</sup> Rayne *et al.*<sup>[4]</sup> also found low levels of education to be a prominent

factor delaying diagnosis. They recommended direct access to a specialist breast cancer clinic to reduce delays in presentation and improve time to diagnosis and care. The SA National Department of Health launched a breast cancer policy in 2017,<sup>[9]</sup> outlining standards to which healthcare providers should adhere when providing care. The provincial Department of Health in Limpopo provides transport for patients to designated referral facilities to ensure ease of access. However, despite all the measures in place, breast cancer patients continue to present with late-stage disease. Our previous study on the profile of breast cancer in Limpopo reported a 69% prevalence of stage 3 and 4 disease.<sup>[10]</sup> The present study is the first to determine factors influencing late presentation of breast cancer patients in Limpopo. Understanding these factors is essential if we are to improve survival rates for patients with breast cancer.

The main objectives of this study were to determine the stage of breast cancer at the time of patients' presentation to the breast clinic, to determine factors influencing late stage at presentation, and to recommend solutions for modifiable factors.

## Methods

This study was conducted at the Mankweng Hospital specialist breast cancer clinic in the rural province of Limpopo, SA, over the 18-month period 1 July 2020 - 31 December 2021, and applied a quasi-experimental design to determine the stage of breast cancer at the time of presentation to the clinic, and factors influencing late-stage presentation. New breast cancer patients were approached

by a trained research assistant during their first visit to the breast cancer clinic for screening and to assess whether they met the inclusion criteria for the study. A survey questionnaire was used to collect data after written consent had been obtained. The study sample size was 274 from a population of 350, representative of the population. The questionnaire was translated from English into the three main local languages, Sepedi, Xitsonga and Tshivenda. Participants were asked questions regarding their demographic characteristics, socioeconomic situation, education level, whether they had consulted a traditional healer, self-perceived proximity to the nearest healthcare facility (km), date of first presentation to the healthcare facility, and time interval between first healthcare facility visit and breast cancer clinic visit. The participant's information was then linked to the clinical stage at presentation as documented in the patient file. Stages at presentation were divided into two categories, early (stages 0, I and II) and late (stages III and IV). Education was categorised into low (primary and no formal education) and higher (secondary and tertiary) levels. Late presentation was defined as a patient who presented at their nearest healthcare facility >2 months after symptoms were noticed, and late referral as when it took >2 months for the patient to be referred from their local healthcare facility to the Mankweng breast cancer clinic.

Data were analysed using descriptive statistics and a  $\chi^2$  test to determine the stage and factors associated with late presentation in patients diagnosed with breast cancer. The collected data were entered onto an Excel spreadsheet, version 2013 (Microsoft Corp., USA). The Statistical Package for the Social Sciences (SPSS), version 28.0 (IBM Corp., USA) was used for data analysis. For continuous variables, results are presented using means and standard deviations (SDs), while categorical variables are described using proportions and frequency tables. Ethical approval was obtained from the Pietersburg-Mankweng Research Ethics Committee (ref. no. PMREC-29 January UL 2020/A).

## Results

Details are reflected in Tables 1 - 4.

### Demographic characteristics

Of the study sample, 269 patients were female (98%) and 5 male (2%). Of the female participants, the majority ( $n=203/269$ ; 75%) had late-stage disease at presentation, with only 66/269 (25%) in the early stages. All but one of the men ( $n=4/5$ ) were in the late stages at presentation. These results show no significant association between gender and stage at presentation (Table 1). The mean (SD) patient age was 54.01 (15.29) years, with the youngest patient aged 20 years and oldest 96 years, and the majority aged >50 years ( $n=146$ ; 53%). The majority of the participants were black Africans ( $n=265$ ; 97%), and of these, the majority ( $n=201/265$ ; 76%) were at a late stage of disease at presentation and only 64 (24%) at an early stage. There was no significant association between race and stage at presentation ( $p>0.05$ ). The majority of participants were married ( $n=136$ ; 50%) at the time of presentation, and of these 99 (73%) were at a late stage of disease and 37 (27%) at an early stage. There was no significant association between marital status and stage at presentation ( $p>0.05$ ). The most affected district was Vhembe ( $n=92$ ; 34%). The majority of the patients were unemployed ( $n=209$ ; 76%), and of these the majority were at a late stage at presentation ( $n=157/209$ ; 75%). There was no significant association between employment status and stage at presentation ( $p>0.05$ ). Similar results were noted for educational level, with the majority of patients with both low and high levels of education at a late stage at presentation. More patients had high school or tertiary education than lower levels of education ( $n=163$ ;

59% v.  $n=111$ ; 41%, respectively). There was no significant association between level of education and stage at presentation ( $p>0.05$ ).

### Stages at the time of presentation since noticing the lump for the first time

The majority of the patients ( $n=150$ ; 55%) presented at the nearest health facility more than 2 months after they noticed the lump in the breast, with 124 (45%) presenting before the 2 months threshold. However, the majority of both groups had late-stage disease, and there was no significant association between delay after first noticing the lump and stage at presentation.

### Causes of delay

The most common reasons for delaying for >2 months before presenting at the nearest health facility were lack of knowledge about breast cancer and its symptoms (not painful, not considered serious) ( $n=99$ ; 36%), initially seeking help from a traditional healer ( $n=17$ ; 6%), suffering from COVID-19, and other effects of the pandemic ( $n=13$ ; 5%), and financial problems ( $n=10$ ; 4%) ( $\chi^2=271.982$  with 11 degrees of freedom;  $p<0.0001$ ).

## Discussion

This study was designed to determine factors contributing to late presentation of patients to the breast cancer clinic, and the relationship between demographic and socioeconomic characteristics of patients with delayed presentation and late stage at diagnosis. It was anticipated that late presentation would be related to advanced stage at diagnosis of breast cancer.

Patient age has been reported to influence the timing of presentation to a health facility. Marcus *et al.*<sup>[11]</sup> reported that middle-aged women (45 - 64 years) sought healthcare within 3 months of noticing symptoms, while younger women (<45 years) were found to attend the health facility after 6 months. In the present study, the majority of patients were aged >50 years ( $n=146$ ; 53%), and most of them had late-stage disease at presentation ( $n=106$ ; 73%, v.  $n=40$ ; 27% who were at an early stage). Of the 128 patients aged  $\leq 50$  years, the majority also presented at a late stage ( $n=101$ ; 79%). The majority of patients with breast cancer were female, were married, had a high level of education, were unemployed, were aged >50 years, and were from Vhembe district. The majority of the patients travelled <20 km to the clinic ( $n=223$ ; 81%). We found no significant association between demographic characteristics and presentation at a late stage ( $p>0.05$ ) (Table 1). Public primary healthcare in SA is provided through clinics and community health centres, available within 5 km to >90% of the population and free at point of use.<sup>[12]</sup> However, we found that clinic proximity did not influence patient behaviour in terms of seeking medical attention at earlier stages of the disease.

Moodley *et al.*<sup>[5]</sup> reported that 50% of their patients made four or more visits to a healthcare provider before being referred to the one-stop breast clinic at a tertiary hospital. The reasons for multiple visits and longer decision-making at primary level need thorough investigation if prompt interventions are to be achieved.

An SA study on breast cancer screening knowledge, attitudes and practices among women found that a low level of education (no formal education and primary education) was associated with minimal understanding of disease presentation and symptom identification, and therefore a late decision to seek medical help.<sup>[6]</sup> A low level of education was found to be associated with an increased risk of late presentation (odds ratio 3.059) in a study in Nigeria.<sup>[13]</sup> Patients with a low level of education were found to have larger tumours ( $p<0.05$ ) in Area 2, KwaZulu-Natal Province.<sup>[14]</sup> However, Trupe *et al.*<sup>[15]</sup> found

**Table 1. Demographic characteristics and tumour stage at presentation**

Variable	Early stage, n (%)	Late stage, n (%)	Total, n (%)	$\chi^2$	df	p-value
Gender				0.055	1	0.8151499
Female	66 (24)	203 (74)	269 (98)			
Male	1 (0.4)	4 (1)	5 (2)			
Total	67 (24)	207 (76)	274 (100)			
Age (years)				1.467	1	0.225818
≤50	27 (10)	101 (37)	128 (47)			
>50	40 (14)	106 (39)	146 (53)			
Total	67 (24)	207 (76)	274 (100)			
Race				0.397a	1	0.5284933
Black African	64 (23)	201 (73)	265 (97)			
White	3 (1)	6 (2)	9 (3)			
Total	67 (24)	207 (76)	274 (100)			
Marital status				1.809a	2	0.4048034
Divorced	3 (1)	6 (2)	9 (3)			
Married	37 (14)	99 (36)	136 (50)			
Single	27 (10)	102 (37)	129 (47)			
Total	67 (24)	207 (76)	274 (100)			
District				1.316a	4	0.8586284
Capricorn	15 (5)	55 (20)	70 (26)			
Mopani	11 (4)	37 (14)	48 (18)			
Sekhukhune	7 (3)	26 (9)	33 (12)			
Vhembe	25 (9)	67 (24)	92 (34)			
Waterberg	9 (3)	22 (8)	31 (11)			
Total	67 (24)	207 (76)	274 (100)			
Employment status				0.087a	1	0.7676476
Employed	15 (5)	50 (18)	65 (24)			
Unemployed	52 (19)	157 (57)	209 (76)			
Total	67 (24)	207 (76)	274 (100)			
Education level				2.813a	1	0.0935127
Low	33 (12)	78 (28)	111 (41)			
High	34 (12)	129 (47)	163 (59)			
Total	67 (24)	207 (76)	274 (100)			

df = degrees of freedom; early stage = 0, I and II; late stage = III and IV; low education = primary and no formal education; high education = secondary and tertiary levels.

**Table 2. Stages at the time of presentation since noticing the lump for the first time**

Variable	Early stage, n (%)	Late stage, n (%)	Total, n (%)	$\chi^2$	df	p-value
Time of presentation				1.746	1	0.1864188
≤2 months	35 (13)	89 (32)	124 (45)			
>2 months	32 (12)	118 (43)	150 (55)			
Total	67 (24)	207 (76)	274 (100)			

Early stage = 0, I and II; late stage = III and IV; df = degrees of freedom.

no association between education and knowledge regarding care-seeking behaviour. We found that the majority of participants with a high level of education were at a late stage at presentation (59%). However, the association between level of education and stage at presentation was not significant. Moreover, Trupe *et al.*<sup>[15]</sup> found that the level of knowledge did not predict care-seeking behaviours or attitudes in the population they studied. Damiani *et al.*<sup>[16]</sup> reported that women of intermediate and high occupational class were more likely to use screening methods compared with those in the lowest class. Our findings provide new information with regard to healthcare-seeking behaviour and level of education. Educated people have access to websites providing information about the side-effects of cancer treatments such as surgery, chemotherapy and

radiation therapy. It is possible that some women read about and are afraid of experiencing such negative effects.

Lack of understanding of the severity of breast cancer was found to be the reason for presenting late for 40% of the participants in the study in rural KwaZulu-Natal.<sup>[14]</sup> The SA study by Rayne *et al.*<sup>[4]</sup> found that the average delay time for patients with locally advanced cancer was 2.5 months from the time of noticing symptoms.<sup>[4]</sup> The present study showed an association between a delay of >2 months and the following: lack of knowledge regarding the breast cancer symptoms (not painful, not considered serious); attending a traditional healer; COVID-19; and financial problems ( $p < 0.0001$ ) (Table 3).

The study in KwaZulu-Natal found that a small proportion of patients (8%) presented to health facilities late because of financial

**Table 3. Causes of delay in presentation for >2 months after noticing symptoms**

Variable	n (%)	$\chi^2$	df	p-value
No delay (presentation $\leq 2$ months)	124			
Causes of delay (presentation >2 months), n=150		271.982	11	<0.0001
Breastfeeding caused delay	4 (1)			
COVID-19	13 (5)			
Fear of hospital/operation	4 (1)			
Lack of knowledge (not painful, not considered serious)	99 (36)			
Waiting for mammogram	1 (0.4)			
Financial problems	10 (4)			
Pregnancy	1 (0.4)			
Refusing by herself	1 (0.4)			
Attended traditional healer	17 (6)			
Total	274 (100)			

**Table 4. Time interval between attending the nearest health facility and presentation at the Mankweng breast cancer clinic**

Time interval	n (%)
$\leq 2$ months	93 (34)
>2 months	181 (66)
Total	274 (100)

issues.<sup>[14]</sup> The SA public health system has provision for planned patient transport, which is probably why we also recorded few patients presenting late due to financial problems (4%). In contrast, late presentation was found to be associated with lack of money, especially for patients living far from the health facilities, in a study by Asoogo *et al.*<sup>[7]</sup> A Bangladeshi study found that 40% of breast cancer patients did not seek medical help because of lack of finances.<sup>[17]</sup>

Traditional healing is a common practice in Africa.<sup>[12]</sup> We found that attending a traditional healer was associated with presentation after >2 months compared with not attending one ( $p < 0.0001$ ). Although the number of patients who visited traditional healers was small ( $n = 17$ ), they all came to the nearest facility after 2 months, and 16 presented with late-stage disease. Another concern in the present study was late referral from local healthcare facilities to the Mankweng breast cancer clinic. We found that many patients (66%) experienced delays in transfer and arrived at the clinic >2 months after first attending their nearest healthcare facility (Table 4). This time interval needs to be shortened. Moodley *et al.*<sup>[5]</sup> also reported that many patients experienced delays in transition of care, sometimes owing to poor healthcare provider knowledge and misdiagnosis.

Early detection and diagnosis are of paramount importance in increasing the survival rate of breast cancer patients. Timely diagnosis also enables more effective and simpler management, which reduces costs. It is therefore essential that primary healthcare units and district hospitals disseminate awareness of and education on early signs and symptoms to the community. Much of this information, including education on signs and symptoms of breast cancer, self-examination of the breasts and management, is included in the National Department of Health's breast cancer prevention and control policy,<sup>[9]</sup> so it is imperative to implement the policy as outlined in the document. The findings of the present study also support the need to include women of younger age in routine screening, as recommended by Lince-Deroche *et al.*<sup>[18]</sup>

## Conclusion

Most of our patients (76%) presented with late-stage breast cancer, and the main reason for the delay was lack of knowledge (not painful,

not considered serious). More younger women had advanced disease compared with those who were older, and of concern is the high number of educated patients presenting with late-stage disease.

Many of our patients came from the Vhembe and Capricorn districts. All 17 patients who attended a traditional healer presented late, and nearly all of them ( $n = 16$ ) had late-stage breast cancer. Marital status had no obvious influence on presentation. Many patients experienced delays in transition of care from local healthcare facilities.

## Recommendations

- A health education and breast cancer awareness campaign for women in Limpopo is of critical importance, and should include those attending primary healthcare for any other reason.
- We recommend that the Limpopo provincial health monitoring and evaluation committee emphasises the implementation of breast cancer policy.
- Reasons for barriers to early referral to the one-stop breast clinic at Mankweng Hospital should be identified and possible solutions suggested, so that the current chain causing delay can be broken.

**Declaration.** None.

**Acknowledgements.** None.

**Author contributions.** Equal contributions (concept, acquisition of data, analysis of data, drafting of the manuscript and critical revision for important intellectual content).

**Funding.** None.

**Conflicts of interest.** None.

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*Accepted 19 September 2022.*