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Exploring Women's Awareness and Perceptions of Cervical and Breast Cancer in Windhoek, Khomas Region

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ABSTRACT

Background: Breast and cervical cancers are the most prevalent cancers among women in Namibia, with a prevalence of 28.9% and 18.3%, respectively, in 2020. However, the knowledge and attitudes of Namibian women toward breast and cervical cancers are not documented, as this is essential for early detection and improved treatment outcomes.

Aim: This study explored the knowledge and attitudes regarding these cancers among women aged 18 and above in Windhoek, Khomas Region.

Methods: A mixed-methods cross-sectional random sampling study was conducted from November 2024 to March 2025 across all eight constituencies of Windhoek. A questionnaire was used to document demographic information, knowledge, and awareness of breast and cervical cancer, cancer screening habits, and barriers to screening. Multivariable logistic regression was used for data analysis.

Results: A total of 232 females participated in the study, of which 93.5% and 95.3% reported having heard of breast and cervical cancer, respectively. Among those who were aware, 35.3% underwent breast cancer screening, while 34.5% had been screened for cervical cancer. Knowledge regarding the causes, symptoms, and prevention of both cancers was moderate to high. Education level was a significant predictor of awareness and screening behavior. Women with tertiary education (73.7%) were four times more likely to have heard of breast cancer (OR = 4.0; 95% CI: 2.8–5.7; $p < 0.001$) and twice as likely to have heard of cervical cancer (OR = 2.0; 95% CI: 1.5–2.7; $p < 0.001$).

Conclusion: Public awareness campaigns regarding early screening are crucial to improve awareness and knowledge regarding breast and cervical cancers among Namibian women.

1 | Introduction

In 2020, cervical cancer was diagnosed in an estimated 604,000 women worldwide, resulting in about 342,000 deaths, with the highest burden observed in low- and middle-income countries. During the same year, breast cancer accounted for roughly 2.3 million new cases and nearly 670,000 deaths globally. According to Singh et al. [1], approximately 90% of these cases occur in low- and middle-income countries, including Namibia. In 2021, breast cancer

was responsible for approximately 660,000 deaths globally, while cervical cancer accounted for around 350,000 deaths [2]. Cervical and breast cancer remain the leading causes of cancer-related morbidity and mortality among women globally and in Namibia. The recent World Health Rankings report a rise in deaths from cervical (133) and breast cancer (121) in Namibia over the past three years, placing the country at 48th globally for cervical cancer mortality and 120th for breast cancer mortality [3].

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Cervical cancer, also known as squamous cell carcinoma of the cervix, affects the cells of the cervix, the inferior part of the uterus, and the interjoining part that connects the uterus to the vagina [4]. The risk factors for developing cervical cancer include having multiple sexual partners, early-age sexual intercourse, sexually transmitted infections, and smoking [5]. Although there has been a struggle to establish a clear etiological rationale for cervical cancer, it has now been proven that 95% of all cervical cancer cases are due to the human papillomavirus (HPV). This specific virus is considered high risk because it is linked with cancers, not only of the cervix but also for other organs as well, such as the vulva, anus, and mouth [6]. In response, the WHO and the Namibian government have introduced elimination strategies to reduce the incidence to fewer than 4 cases per 100,000 women annually. While efforts such as vaccination, screening, and awareness campaigns are in place, their effectiveness remains uncertain.

Gamde et al. [7] stipulate that histopathological techniques are the cornerstone of diagnosing cervical cancer, and cytology is used to screen for the disease. The initial stages of cervical cancer are hardly noticeable, but once it has been fully established, it will present with symptoms of vaginal bleeding after copulation, foul-smelling vaginal discharge, and pelvic pain during intercourse [6].

The management plan for cervical cancer is determined by the spread of the cancer, and up to date, the following options are surgery, chemotherapy, and radiotherapy [4]. Precancer treatments such as ablative therapy with cryotherapy and or thermal ablation are also recommended to halt the progress of cervical cancer. Complications of cervical cancer may result from delayed or inadequate treatment or from treatment-related side effects. Advanced disease can cause severe pain, bleeding, urinary tract obstruction leading to renal failure, fistula formation, and metastasis to distant organs. Treatment with surgery, radiotherapy, or chemotherapy may lead to early menopause, vaginal stenosis, lymphedema, and other genitourinary, gastrointestinal, and hematologic complications [8].

Breast cancer is an adenocarcinoma arising from the epithelia of ducts (85%) and glandular tissue of the breast lobules (15%). Namibia and other African countries are not an exception from these statistics. The WHO [4] reports 133 deaths attributed to breast cancer from 2018 to 2020 in Namibia.

Breast cancer initially develops in the ducts or lobules, where it is confined (in situ), often asymptomatic, and less likely to metastasize. Over time, it may spread to other glands and organs. The cause and pathophysiology of breast cancer result from an interaction between modifiable and nonmodifiable factors such as genetics, hormonal influences, nutrition, and lifestyle activities contributing to disease pathogenesis [9]. Predisposing factors increasing cancer risk include a positive family history, nulliparity, obesity, tall stature, hormone therapy, and substance use such as alcohol and smoking [10]. The WHO [4] emphasizes that breast cancer signs and symptoms are often noticeable, including a painless lump in the breast or armpit, irritation or dimpling of the breast skin, redness around the nipple or breast skin, bloody nipple discharge, unusual breast pain, and changes in breast size or shape. Diagnosis follows a three-step “triple assessment” approach, beginning with a thorough history and

breast examination to confirm whether presenting complaints and signs align with those of breast cancer, as outlined by the National Comprehensive Cancer Network (NCCN) Clinical Practice Guidelines in Oncology Educates [11].

The third component of the triple assessment is histological or cytological examination, which makes use of biopsy specimens and smears obtained by fine-needle aspiration, respectively. Breast cancer has a good prognosis if diagnosed and treated early. Treatments include chemotherapy, which kills rapidly dividing cells, radiotherapy, hormone therapy, and mastectomy [12]. Each of these treatments has side effects that contribute a huge portion to the complications of breast cancer. Chemotherapy can cause sleep disturbances, fatigue, bruising and bleeding, medication-induced depression, sadness, and fear. Radiotherapy can cause complications of secondary cancers, cardiovascular malfunctions, and inflammation of lung tissues. Hormone therapy and mastectomy are attributed to temporary swelling of the breast, tenderness, wound infection and hemorrhage, lymphedema, and phantom breast pain [13].

In summary, despite the implementation of national cancer prevention strategies in Namibia, there remains a limited understanding of the public's knowledge, attitudes, and practices regarding breast and cervical cancer, particularly among women aged 18 years and above. Most existing data focus on national incidence and mortality rates, yet little is known about the extent to which women are aware of risk factors, symptoms, and the importance of early detection. Furthermore, while screening services are available, there is a lack of evidence on their uptake and the sociocultural or educational barriers that may hinder participation. The available data do not adequately reflect the community-level realities, especially within urban populations such as those in Windhoek.

Additionally, there is limited information on the public's perception of the government's elimination strategies, including HPV vaccination programs, breast and cervical cancer awareness campaigns, and screening initiatives. Current surveillance efforts do not determine whether women are aware of these services or whether the intended impact has been achieved. This study aims to address these gaps by exploring women's knowledge and attitudes toward these cancers in Windhoek and examining how this influences their health-seeking behavior. Doing so will provide context-specific evidence to support the redesign of existing cancer control strategies in Namibia. The study also seeks to evaluate how successful these interventions have been, especially given the rising cases of breast cancer. Moreover, there is little data on the most common subtypes of these cancers in Namibia, as well as limited understanding of women's knowledge, attitudes, and participation in screening, which are the key factors in meeting elimination goals.

1.1 | Aim

To explore women's awareness and perceptions of cervical and breast cancer in Windhoek, Khomas Region.

The study objectives:

- i. To determine the uptake of breast and cervical cancer prevention services in Windhoek, including vaccination, screening, treatment, and educational campaigns.

- ii. To assess women's knowledge of breast and cervical cancers in Windhoek.
- iii. To evaluate the effectiveness and progress of cancer elimination strategies in reducing breast cancer.

2 | Methodology

2.1 | Research Design and Setting

This study used a mixed-methods cross-sectional design to investigate knowledge and attitudes relating to cervical and breast cancer among women aged 18 years and above in Windhoek, Khomas Region (November 2024 to March 2025). Some questions aimed to quantify the number of women who are aware of these cancers and have been screened. Other questions aimed to assess the knowledge on how breast and cervical cancer present, as well as barriers to screening, and how they can be addressed.

2.2 | Sample Size and Sampling Method

The sample size was determined using a formula adopted from the NCBI designed to estimate a population proportion.

$$n = \frac{P(1 - P)(1.96)^2}{d^2} \quad (1)$$

Using statistics from the Namibian Census report of 2023 of the number of women in Windhoek and those who are aged for our study, the researcher anticipated the women with knowledge on breast and cervical cancer to be 81.4% ($p = 0.814$; $d = 0.05$ is the desired precision). The minimum sample for this study was therefore calculated to be 232.

A stratified simple random sampling method was used. Constituencies formed the strata, and within each, participants were randomly approached. Recruitment occurred through door-to-door visits and online invitations via WhatsApp and Facebook. Every woman aged ≥ 18 years who met the inclusion criteria had an equal chance of selection.

This technique aligns with standard practices in mixed-methods population-based research, where unbiased participant selection is essential for valid inference [14]. A total of 232 participants were successfully recruited between November 2024 and February 2025, representing a diverse sample across age groups and backgrounds.

2.2.1 | Inclusion Criteria

The inclusion criteria included the following:

- Female Windhoek residents for the past 2 years.
- All females over the age of 18 years.
- All races.
- Patients who have been screened/diagnosed/or ever treated for breast and cervical cancer.
- All religions.
- All tribes.

2.2.2 | Exclusion Criteria

The exclusion criteria were as follows:

- Patients who are over-aged or cannot clearly remember how much they have sought screening or treatment for breast and cervical cancer.
- Women who do not have the mental capacity to give consent or provide information.

2.3 | Data Collection Tools

An online survey (Google Forms) was used to collect the required data (Appendix C).

2.4 | Data Collection Procedure

Quantitative data were collected using a structured questionnaire covering demographics, knowledge, attitudes, screening behaviors, and barriers. The instrument underwent expert review for content validity and a pilot test ($n = 15$) for clarity and reliability (Cronbach's $\alpha = 0.82$). Participants who met the inclusion criteria took part by clicking the link to the study questionnaire and answering the questions.

Qualitative data were obtained through in-depth interviews with a purposive subsample ($n = 12$) to explore perceptions and barriers in greater depth. Interviews were audio-recorded, transcribed verbatim, and translated into English where necessary. Face-to-face interviews were also conducted to reach individuals who are not digitally connected, particularly those who are undereducated and over 50 years old.

The questions were asked in English, and translation was provided to native languages such as Oshiwambo and Otjiherero upon request. The researcher also found translators to convert the material into languages such as Afrikaans, Damara, and Kavango, upon request. Survey questions were simplified and clarified at the participants' request, and the researcher provided his contact details so that participants filling out the survey in the comfort of their homes could reach him.

Before the questions were asked, participants were required to consent to participation, allowing them to continue answering. The questions included items on knowledge and attitudes related to cervical and breast cancer, such as their awareness of the causes and how they should protect themselves and their families or partners. Questions on screening practices addressed whether they had been screened, how many times, why they believed screening was important, and if they would recommend it. The questions were selected based on their relevance to the Namibian context, considering the diverse cultures and religions in Namibia.

To ensure data quality, door-to-door recruiters received standardized training, and for online responses, IP tracking and duplicate checking were employed. The final questionnaire was organized into (a) demographics, (b) knowledge and attitudes toward breast cancer, and (c) knowledge and attitudes toward cervical cancer.

2.5 | Data Analysis

Quantitative data from the electronic survey were entered into Excel, imported into EpiData EntryClient (v4.6) with validation checks in EpiData Manager (v4.6), and analyzed in EpiData Analysis (v2.2.3.187). Descriptive statistics summarized demographics and levels of knowledge and attitudes toward breast

and cervical cancer, using frequencies and percentages for categorical variables, and medians or means for continuous variables. Variables significant in bivariate analysis were entered into a binary logistic regression model to identify independent predictors of adequate knowledge or positive attitudes toward screening, with results reported as adjusted odds ratios (ORs) and 95% confidence intervals (CIs). A *p* value < 0.05 was considered statistically significant. Qualitative data were analyzed thematically using Braun and Clarke's six-step framework, with two independent coders reviewing transcripts to enhance credibility.

2.6 | Ethical Considerations/Research Ethics

Initially, approval for this study was obtained from the University of Namibia and the Ministry of Health and Social Services as indicated in Appendix A (reference number: 22/3/1/2). An information letter was provided at the beginning of the Google questionnaire, outlining the primary aims, objectives, and significance of the study, as well as the risks associated with participant involvement. The information letter (Appendix B) also emphasized how anonymity and confidentiality would be maintained. Furthermore, participants were informed about the parties that might have access to the study's results and that, while the study may be published, no patient identification details will be revealed. Participants also provided their consent to participate, which was the very first question in the Google Forms questionnaire (Appendix C). In conclusion, this study was conducted with a strong commitment to research ethics, including autonomy (consent), nonmaleficence, and protection of confidentiality.

3 | Results

3.1 | Sociodemographic Characteristics

A total of 232 women participated, giving a response rate of 100%. The median age group was 18–30 years (73.7%), with only 5.2% aged ≥ 51 years. The majority were single (90.1%) and students (68.1%). Over two-thirds (73.7%) had tertiary education (Table 1).

The constituency participation distribution is outlined in Figure 1. Most participants who were sure of their constituencies lived in the Khomasdal Constituency (23.7%), followed by the Windhoek West constituency (20.7%). The remaining participants were from Katutura Central (7.8%), Katutura East (6.5%), Samora Machel (5.6%), Moses Garoeb and Tobias Hainyeko (each with 4.7%), and Windhoek Rural Constituency (2.2%).

More than three-quarters of the participants were from the Oshiwambo-speaking tribe (83.6%), followed by the Damara Nama tribe (5.6%), and Kavango and White Namibian tribes both had a representation of 2.6%. The other tribes, which included Herero/Himba, Baster, Caprivians, Zemba, Tswana, and San, all had a cumulative representation of 7.94% (Figure 2).

3.2 | Knowledge of Breast Cancer

More than three-quarters (93, 5%) of the women who participated in the study have heard of breast cancer once or twice in their lifetimes. Among the women who have heard of breast cancer (217/232), only 35.3% of these women ever had breast cancer screening, and 64.7% never had any form of breast cancer screening. A mean percentage of 3.4% of respondents could not

TABLE 1 | Demographic characteristics of participants (n = 232).

Variable	Category	n (%)
Age group	18–30	171 (73.7)
	31–40	28 (12.0)
	41–50	21 (9.0)
	≥ 51	12 (5.2)
Marital status	Single	209 (90.1)
	Married	21 (9.1)
	Widowed/divorced	2 (0.8)
Occupation	Student	158 (68.1)
	Employed/self-employed	46 (19.8)
	Unemployed/housewife	28 (12.1)
Education	No formal	4 (1.7)
	Primary	18 (7.8)
	Secondary	39 (16.8)
	Tertiary	171 (73.7)

give a correct response to what is breast cancer (Figure 3), either attributing it as a nutrition deficiency disorder (5.6%) or a sexually transmitted infection (0.4%) and some not knowing at all (4.3%).

Out of 232 respondents, most correctly identified at least one true symptom of breast cancer. A lump in the breast and/or armpit (89.7%), nipple discharge (58.6%), and changes in breast size or shape (48.3%) were the most recognized signs. Misconceptions were also present: 13.8% cited weight loss, and a few indicated unrelated symptoms such as nausea/vomiting (1.3%) and headache (0.4%). About 7.3% of respondents admitted they did not know any symptoms of breast cancer (Table 2).

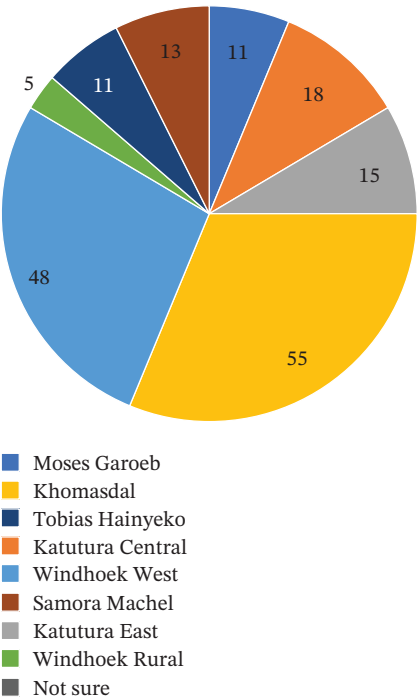


FIGURE 1 | Constituencies participated.

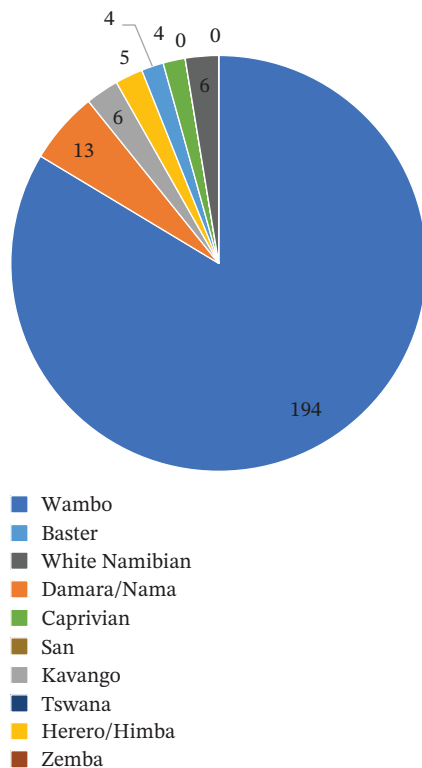


FIGURE 2 | Cultural distribution of study population ($n = 232$).

3.3 | Knowledge of Cervical Cancer

A percentage of 2.3 of the interviewed population has heard of cervical cancer (95.3%) more than they have heard of breast cancer. Among the respondents who have heard of cervical cancer (221/232), only 34.5% have ever had a Pap smear or VIA done for cervical cancer screening. More than three-quarters of the respondents provided the right response of what cervical cancer is (92.7%), being a malignant disease that affects the lower womb (Figure 4).

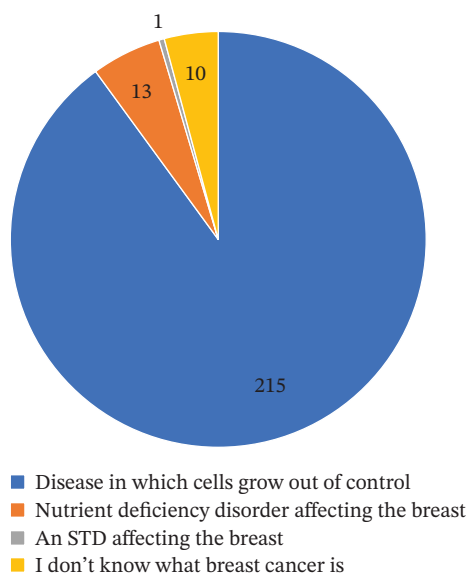


FIGURE 3 | Responses on what breast cancer is.

Among the 232 participants, the most frequently identified signs of cervical cancer were abnormal vaginal bleeding (64.2%), pain during sexual intercourse (61.2%), and pelvic pain (55.6%), which were all valid symptoms. A notable 22.4% of respondents indicated they did not know any symptoms. Some participants incorrectly cited weight loss (13.8%), nausea/vomiting (3.0%), and headache (0.9%) as symptoms, reflecting existing knowledge gaps (Table 3).

3.4 | Attitude on Breast and Cervical Cancer

The overall attitude toward the abovementioned cancers among the respondents was assessed separately although with related questions, which mainly focused on why they think it is important to be screened, what are limitations to screening, and solutions to combat these barriers, and more half than of the population could outline sensible answers which shows a positive attitude toward breast and cervical cancer.

Ninety-seven percent of the population believes that it is important to be screened for breast cancer because early detection can improve treatment and save lives, although 70% percent of these have never received any form of breast cancer screening. Similarly, 97% of the population believes it is important to be screened for cervical cancer because early detection improves treatment and saves lives, although only 13.3% have ever been screened for cervical cancer. In total, 72% (167/232) and 44.4% (103/232) of women have never been screened for cervical cancer and breast cancer, respectively.

There was no association between the respondents' employment status with the frequency of being for breast cancer. Among students and the employed (the most participants), 36.7% were never screened, and 37.2% of the unemployed class were also never screened (OR = 1.01; 95% CI: 0.95–1.08; $p = 0.75$). However, the students and the employed were thrice more likely to have cervical cancer screening than the unemployed (OR = 3.0; 95% CI: 2.2–4.1; $p < 0.001$) (Table 4).

Most of the population believed that the best way to overcome barriers hindering breast and cervical cancer screening was to increase awareness of regular screening and provide information about the available services, 63.8% and 73.3%, respectively (Table 5).

4 | Discussion

4.1 | Knowledge and Awareness

Breast and cervical cancers are major public health concerns in Namibia, with cervical cancer the leading cause of cancer-related deaths among women and breast cancer the most frequently diagnosed [3]. Many cases present at advanced stages due to limited screening and low awareness, increasing both mortality and morbidity during women's most productive years. Improving knowledge is essential for shaping health-seeking behavior, promoting early detection, and acceptance of free preventative services such as screening, HPV vaccination, and Pap smears. This study, therefore, examines women's awareness, attitudes, and use of these services in Windhoek, in line with national cancer elimination goals. This agrees with the findings of Alemayehu et al. [15].

TABLE 2 | Knowledge of signs and symptoms of breast cancer.

Sign/symptom	Frequency (n)	Percentage (%)	Correct symptom
<i>A lump (mass) in the breast and/or armpit</i>	208	89.7	*
<i>Nipple discharge</i>	136	58.6	*
<i>Change in size and shape</i>	112	48.3	*
Weight loss	32	13.8	
I don't know the symptoms of breast cancer	17	7.3	
Nausea/vomiting	3	1.3	
Headache	1	0.4	

Note: The italic values are the correct answers to this question.

*The correct answers in the table.

Knowledge of breast and cervical cancer varied among participants. While many were aware of breast and cervical cancer, knowledge of the risk factors and symptoms was, however, limited. Women with tertiary education (171/232) were four times likely to have heard about breast cancer than those with lower education (OR = 4.0; 95% CI: 2.8–5.7; $p < 0.001$) and twice as likely for cervical cancer (OR = 2.0; 95% CI: 1.5–2.7). This trend is consistent with findings from other African settings. A study conducted by Moodley et al. [16] in South Africa showed that 91.2% of urban South African women, who generally had higher education levels, had heard of breast cancer, compared to only 79.9% of their uneducated counterparts. Similarly, awareness of cervical cancer was 82.3% among women with higher education versus 79.9% among women with primary and no education [16].

This study showed that 7.3% (17/232) and 22.4% (52/232) of the participants did not know the signs and symptoms of breast cancer and cervical cancer, respectively, at all. Women who received a tertiary education demonstrated better knowledge of the signs and symptoms of these cancers. Among those who attained primary education and never attended school (22/232), 59% (13/22) of them did not know any signs and symptoms of breast cancer, and 77% (17/22) did not know the signs and symptoms of cervical cancer. Similar to the findings of this study,

a study conducted in rural Eastern Cape, South Africa, revealed that both women and men had limited knowledge of the symptoms, despite having heard of the diseases. Knowledge levels were notably lower among those with less education [17]. These findings reveal the need for targeted educational interventions to improve women's knowledge of breast and cervical cancer symptoms, which is crucial for early detection and treatment.

4.2 | Screening Uptake and Barriers

Although almost every participant (95.3% for cervical and 93.5% for breast) had ever heard of these cancers, 72% and 44.4% had never been screened for cervical and breast cancers, respectively. In agreement with our results is another study done in Ethiopia, which reports that only 8.7% of women had ever been screened for cervical cancer [18]. These low rates of screening reflect how a greater portion of the female population remains at risk of late diagnosis and poor treatment outcomes. If so, few women are screened, and efforts to reduce mortality from these preventable cancers will continue to be ineffective. It is therefore essential to not only raise awareness but also to make screening more accessible and routine.

This study identified both structural and sociocultural barriers to breast and cervical cancer screening in Windhoek. Systemic constraints included lack of facility access (breast: 28.8%; cervical: 37.9%), high costs (breast: 23.7%; cervical: 26.3%), difficulty in scheduling appointments (breast: 31.5%; cervical: 29.7%), lack of transportation (breast: 13.8%; cervical: 13.8%), and cultural and religion prohibition (breast: 0.4%; cervical: 3.4%), and 41.4% and 36.6% of the women did not identify any barrier to breast and cervical cancer screening, respectively, at all.

Sociocultural factors also emerged as important influences. Qualitative findings revealed that some women view screening as unnecessary in the absence of symptoms, reflecting a reactive rather than preventive approach to health. This perception is reinforced by limited community-level education on asymptomatic disease progression.

Religious beliefs played a smaller but notable role. A few participants expressed that undergoing screening was inconsistent with their faith, or that religious leaders discouraged it. Such beliefs, though less prevalent, can create strong personal barriers when combined with broader mistrust of the healthcare system, which is reflected in concerns about privacy, judgment from healthcare staff, and fear of being stigmatized if diagnosed.

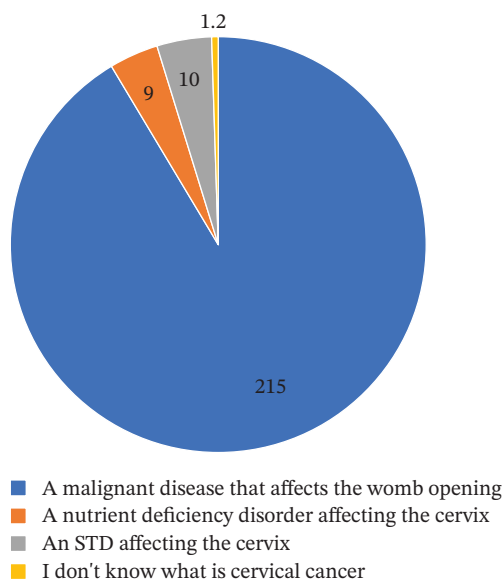
**FIGURE 4** | Responses on the definition of cervical cancer.

TABLE 3 | Knowledge of the signs and symptoms of cervical cancer.

Sign/symptom	Frequency (n)	Percentage (%)	Correct symptom
<i>Abnormal vaginal bleeding</i>	149	64.2	*
<i>Pain during sexual intercourse</i>	142	61.2	*
<i>Pelvic pain</i>	129	55.6	*
Weight loss	32	13.8	
I don't know any symptoms of cervical cancer	52	22.4	
Nausea/vomiting	7	3.0	
Headache	2	0.9	

Note: The italic values are the correct answers to this question.

*The correct answers in the table.

TABLE 4 | Multivariable logistic regression of factors associated with screening uptake.

Variable	Breast cancer screening		Cervical cancer screening	
	adjusted OR (95% CI)	p value	adjusted OR (95% CI)	p value
Tertiary vs. ≤ secondary education	3.20 (1.90–5.30)	< 0.001	1.80 (1.10–2.90)	0.015
Employed vs. unemployed	1.10 (0.65–1.85)	0.72	2.50 (1.50–4.15)	< 0.001
Age ≥ 31 vs. 18–30	1.45 (0.85–2.45)	0.17	1.68 (0.98–2.88)	0.06

A mixed-methods study conducted in Makurdi, North-Central Nigeria, by Irowa et al. [19] identified significant gaps and barriers to cervical cancer screening at the primary healthcare level, including the absence of routine screening services, inadequate trained personnel and equipment, poor awareness among women, high screening costs, long distances to health facilities, fear of positive results, and low perceived risk of cervical cancer. These findings closely align with those observed in our study. These findings closely mirror the barriers identified in our study. To overcome these barriers, the Ministry of Health and Social Services can introduce mobile screening units that travel to remote areas regularly. Strengthening and increasing community health outreach programs can also improve access and awareness. Subsidizing transport or offering screening during community events may further boost uptake. Partnering with local organizations can ensure services are trusted and well-utilized.

A systematic review across sub-Saharan Africa found that the prevalence of cervical cancer screening was 19.0%, with Namibia at large having the highest at 45.9% [20]. However, disparities persist, especially among women with lower education and those in rural areas. This is also reflected in this study whereby participants with tertiary education were over three times more likely to have undergone breast cancer screening (OR = 3.2; 95% CI: 1.9–5.3; $p < 0.001$) and nearly twice as likely for cervical cancer screening (OR = 1.8; 95% CI: 1.1–2.9; $p = 0.015$). This is just another reflection of how educational attainment plays an important role in the awareness and utilization of cancer prevention services.

With the low cancer screening uptake among women aged 18 years and above in Windhoek, as found by this study, the effectiveness of the implemented strategies is currently ineffective. Their effectiveness is also hindered by knowledge gaps.

4.3 | Practical Recommendations

This study found that the effectiveness and utilization of these services can be improved by increasing access to affordable health care (54.3%), providing financial assistance for screenings (31.5%), providing flexible scheduling options and transportation (31.5%), increasing awareness of outreach dates and available resources (63.8%), and addressing cultural and religious anti-screening factors (23.9%).

A study conducted in Tshwane, South Africa, investigated whether combining breast and cervical cancer screenings could combat barriers such as limited access to healthcare services, lack of awareness, and transportation costs. This is achieved by offering both screenings simultaneously. The study found that while 14% of participants had previously undergone cervical cancer screening, 65.4% accepted the combined screening offer during the program. This approach enhanced screening participation rates [21].

Tailored health education delivered in local languages and emphasizing the preventive nature of screening can help shift perceptions from treatment to early detection, ultimately improving uptake and aligning with Namibia's cancer control goals. Although Pap smears are one of the most effective tools for early detection of cervical cancer, this study found that many participants either did not understand what a Pap smear was or had misconceptions about its purpose. Several women were unsure whether it was a treatment or a general checkup, and very few had undergone the procedure. Similarly, in a study done in Lagos, Nigeria, by Wright et al. [22], baseline awareness was low, with only 6.9% of women aware of the Pap smear, and less than 10% possessing accurate information about its use. This lack of understanding directly impacts screening uptake. Pap smears are critical in detecting precancerous changes early when treatment is most effective and outcomes are best [22]. It is important to acknowledge that awareness regarding the availability of

TABLE 5 | Attitude on breast and cervical cancer.

Suggested intervention	Breast cancer screening (%)	Breast (n = 232)	Cervical cancer screening (%)	Cervical (n = 232)	Average percentage (%)
Increase awareness of regular screenings	63.8	148	73.3	170	68.5
Increase access to healthcare	51.3	119	57.3	133	54.3
Provide financial assistance for screenings	30.2	70	32.8	76	31.5
Address cultural, religious, and social discouraging factors	22.4	52	25.4	59	23.9
Providing flexible scheduling options and transportation	31	72	29.3	68	30.1

diagnostic and treatment procedures and screening programs can influence the cancer burden [23]. The WHO [3] has indicated that 95% of cervical cancer is caused by sexually transmitted HPV. However, more community engagements to create awareness regarding the significance of HPV vaccination yet have to be done in Namibian populations especially in resource-poor settings.

When asked about breast self-examination, most participants were aware of the concept but did not practice it regularly or correctly. Some heard about it from clinics but admitted they did not know how to do it (7.8%) or how often to do it. Breast self-examination is an important, low-cost, accessible method for early detection of breast changes, especially in settings where clinical breast exams or mammography are not easily available [24]. This is consistent with a study in Wolaita Sodo, Ethiopia, where only 34.5% of women practiced BSE [25]. In Namibia, an analysis of the 2013 Demographic and Health Survey revealed that only 30.67% of women aged 15–49 performed breast self-examinations [26]. Promoting monthly breast self-examination, supported by simple demonstrations during clinic visits or community events, can empower women to take control of their breast health and seek care early if abnormalities are detected.

5 | Limitations of the Study

There were no participants from the Zemba, Tswana, and San cultures. The findings of this study would therefore potentially undermine the representativeness of the women who fall into this cohort. This study could not, therefore, ascertain whether the zero representation of the women of these cultures was attributed to this barrier or just merely no representation. This study has several limitations. First, it was conducted exclusively in Windhoek, which limits the generalizability of the findings to women in rural regions of Namibia who may have different levels of access to information and health services. Second, the use of self-reported data may introduce the risk of recall and social desirability bias, potentially affecting the accuracy of responses regarding awareness and screening behaviors. Lastly, the cross-sectional design prevents the establishment of causal relationships and does not capture changes in knowledge and attitudes over time.

6 | Conclusion and Recommendations

This survey aimed to assess the level of knowledge and attitudes toward breast and cervical cancers among women aged 18 years and older in Windhoek, Khomas Region. The main impression given by the study is that the knowledge of these two cancers was average. Although most of them had heard and knew the risk factors of breast and cervical cancer, there were very low screening rates. The study identified a lack of resources and knowledge about screening programs as key barriers preventing women from being screened. These potential barriers can be addressed by increasing the awareness of routine screenings through social media and other technology platforms, providing financial assistance for screenings, and providing flexible scheduling options for women who are finding it hard to book appointments. Further studies should be conducted in other areas in Namibia, such as in the north, to understand the knowledge and attitudes of these cancers on a much larger national scale. Studies also need to be carried out to understand

the probable effectiveness of the individual strategies employed to advance knowledge and positively improve attitudes about these cancers.

Author Contributions

Likius T. Hailaula: conceptualization, data curation, formal analysis, investigation, methodology, and writing–original draft.

Albertina M. N. Shatri: conceptualization, data curation, project administration, supervision, validation, visualization, and writing–review and editing.

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Disclosure

All authors revised and approved the final version of the manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. (*Supporting Information*)

Appendix A: MoHSS ethical approval.

Appendix B: Participant consent form.

Appendix C: Data collection tool.