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Knowledge, Attitudes, and Preventive Practices Related to Breast and Cervical Cancer among Rural Women in Sidama, Ethiopia: A Facility-Based Cross-Sectional Study

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Abstract

Background

Breast and cervical cancers are the leading causes of cancer-related morbidity and mortality among women worldwide. Early detection significantly improves outcomes; however, uptake of screening services remains low due to limited knowledge, negative attitudes, and socio-cultural barriers. This study evaluated knowledge, attitudes, and practices regarding breast and cervical cancer among rural women in Dalle district, Sidama National Regional State (SNRS), Ethiopia.

Methods

A cross-sectional study was conducted in health facilities among 356 women aged ≥ 18 years in Dalle district, SNRS. Data were collected using a pretested structured questionnaire. Descriptive statistics were employed, while binary and multivariable logistic regression analyses identified factors associated with knowledge and screening practices. Statistical significance was set at $p < 0.05$ with 95% confidence intervals.

Results

Overall, 80.3% of the participants had heard of breast and cervical cancer. However, comprehensive knowledge was low, with 84.83% demonstrating poor knowledge of breast cancer and 38.76% lacking adequate knowledge of cervical cancer. Health extension workers were the mainstay of cancer-related information (37.1%), while schools were the rare sources of breast and cervical cancer-related information (only 1.7%). Negative attitudes were observed in 53.36% and 54.71% of participants toward breast and cervical cancer, respectively. Only 32% had ever practiced breast self-examination. Factors significantly associated with better knowledge included younger age (AOR = 5.22; 95% CI: 1.72–15.90), higher education (AOR = 6.54; 95% CI: 2.91–14.73), and access to information (AOR = 3.21; 95% CI: 1.66–6.21).

Conclusion

Among rural women, knowledge and preventive practices related to breast and cervical cancer were limited. Key barriers included socioeconomic disparities, limited access to information, and negative attitudes. Curriculum-based education in schools, comprehensive cross-cutting health education, and targeted community-based intervention programs are essential to improve awareness and screening uptake.

Background

Cancer is a major public health challenge and a leading cause of premature mortality, and an important factor in decreasing life expectancy in every country worldwide [1]. Breast and cervical cancers are the most commonly diagnosed cancers among women worldwide and are particularly prevalent in low- and middle-income countries, including Ethiopia [2, 3]. Despite prevention and treatment advancements, late diagnosis remains a significant challenge, mainly due to limited awareness and poor access to screening services [4].

In Ethiopia, cancer accounts for a growing proportion of mortality, with breast and cervical cancers contributing substantially to the burden among women. It is estimated to account for about 5.8% of total national mortality. Although comprehensive population-based data is not available in the country, it is estimated that the annual incidence of cancer is around 60,960 cases and the annual mortality is over 44,000 [5].

Early detection of signs and symptoms of both cancer forms is the basis for curative treatment approaches. Mammographic screening for breast cancer is impractical in many countries, especially in low-income countries. However, awareness creation through public health education, understanding of the importance of early detection and treatment, and the role of consulting medical practitioners upon first suspecting breast cancer are predictors in improving the disease outcome [6]. The cervical cancer screening program is effective in reducing cervical cancer incidence [7]. However, a number of factors are known to influence the screening uptake. Among those are the knowledge about the disease and availability of screening services, perception, beliefs, and attitudes of the individuals and culture, and an attitude of the partner [8]. Visual Inspection with Acetate (VIA), a cheaper but effective technique for screening of cervical cancer, is adopted by the Ethiopian government and is employed for routine screening for early detection of asymptomatic women, aged 30 to 49 years, and on-the-spot cryotherapy treatment of cervical pre-cancerous lesions [9].

However, evidence indicates that knowledge and utilization of screening services remain low, particularly in rural communities. Sociocultural beliefs, misconceptions, and limited health information further hinder preventive practices [10]. Although studies have been conducted in urban settings, there is limited evidence from rural areas of Sidama National Regional State (SNRS). This study, therefore, aimed at assessing the knowledge and its predictors, attitudes, and preventive practices toward breast and cervical cancer among rural women in Dalle district.

Methods

Study Area, Study Design, Population, and Sampling Techniques

A descriptive facility-based cross-sectional survey was conducted in Dalle district of the SNRS, Ethiopia (Fig. 1). The data were collected from four different Health Centers (Magara Health Center, Bera Tadicho Health Center, Masinkala Health Center, and Moto Health Center) between April and September, 2024.

Pretested and enhanced semi-structured questionnaires were administered to consenting study participants to generate data on variables such as demographic characteristics, lifestyle, personal behavior, beliefs, awareness, and perceptions about various cancer forms, particularly cervical and breast cancer. In addition, knowledge of the study participants about the causative agents, prevention methods, risk factors, and screening methods of cervical and breast cancer was recorded.

The target populations of this study were women aged ≥ 18 years, residents in the rural Dalle district of the SNRS, and visiting the nearby health center seeking reproductive health services. The SNRS is the 10th member state of the Ethiopian Federal Democratic Republic, officially formed after the Referendum conducted on November 20, 2019. Formerly one of the highly populous zones under the Southern Nations, Nationalities and Peoples regional state, Sidama accounts for 4.0% of the National population of about 115 million [11]. Administratively, the region is structured into 30 woredas (districts) and seven city administrations. The capital city of the SNRS is Hawassa city and is 275km away from Addis Ababa in the southeast direction, with a projected population of half a million [11]. The geographical location of the Dale district is 6°27' to 6°51'N latitude and 38°0' to 38°37'E longitude. Yirgalem town, the capital and economic center of the district, is located about 317 kilometers southeast of Addis Ababa.

A single population proportion formula, [$n = (Z\ \alpha/2)^2\ p\ (1\text{-}p)/d^2$], was used to estimate the sample size of women to be interviewed. The following assumptions have been made: N = the number of participants to be interviewed; $(Z\ \alpha/2)^2$ = standardized normal distribution value for the 95% CI, = 1.96; proportion of women having knowledge about cervical cancer and breast cancer as 33% (p = 0.33); d = margin of error taken as 5%; 10% non-response rate. Accordingly, the sample size turned out to be 339. With the addition of 10% non-response rate, a total sample size of 374 was considered.

Data Collection Tool Design

Questionnaire design

The questionnaire items, administered face-to-face, were initially prepared in English and translated into Amharic, the national working language, and Sidaamu-Afoo, a regional working language, by the language experts with vigorous cross-checking for authenticity and accuracy. A pilot was conducted on ~ 5% of the sample size of a different population with similar socio-economic characteristics in a rural district of the region. During the pretest, ambiguous questionnaire items were revised and clarified.

There is no nationally validated survey tool to assess the knowledge, attitudes, and practices of rural communities about breast and cervical cancer in Ethiopia. For this particular study, the tools were adopted from the American Cancer Society, Champion's Health Belief Model Scale, and Powe's Fatalism Inventory with major modifications [12–14]. The questions were constructed in such a way that it fits the cultural setting and religious beliefs of the community. Completeness, accuracy, and consistency of the gathered information were cross-checked by the blinded assistant.

The questionnaire contained 8 different closed-ended questions to determine the knowledge of participants about etiology, risk factors, screening, prevention, and treatment of breast cancer. There were also 8 different questions to determine the knowledge of participants about etiology, risk factors, screening, prevention, and treatment of cervical cancer. Sixteen (16) closed-ended questions were included in the questionnaire to assess attitudes of the study participants about breast and cervical cancer separately.

For knowledge assessing questionnaire items, a nominal scale of “1” was assigned for the right response and “0” for both wrong/neutral/not certain responses. For questionnaire items assessing attitudes, a Likert-like *scale* where a negative response was scored as “1”, a not certain response was scored as “2,” and a positive response was scored as “3,” indicating a positive attitude towards the variable under investigation. The higher the value, the closer to 3, the more positive the attitude, whereas the lower the value, the closer to 1, the more negative the attitude. For this particular study, an average was calculated for each respondent and the value of 2.75 was categorized as having positive attitude, whereas others were considered as having a negative attitude. The Cronbach’s alpha was computed to determine the internal consistency of the dichotomous knowledge assessing variables (“0” or “1” score) and a three-scale (“3”, “2,” or “1”) score of attitude assessing items, separately for both breast and cervical cancer [15]. Accordingly, the obtained Cronbach's alpha values were 0.759 for knowledge items, 0.757 for attitude items, indicating acceptable reliability.

Statistical Analysis

Descriptive statistics such as frequency, percentage, mean, aggregate mean, and standard deviation were used to describe the study population using the latest version of SPSS (IBM SPSS, Chicago, IL). Tables and charts were used to present the findings. Associations among variables were assessed using binary logistic regression. To assess a series of predictor variables, multivariate logistic regression analysis was employed. $P < 0.05$ at a confidence interval (CI) of 95% was considered statistically significant. Odds ratios were used to test the association between the binary variables.

Results

Socio-demographic characteristics

A total of 356 women completed the survey, making the response rate of 95.2%. Of the participants, 228(64.0%) were aged between 18 and 35, and 262 (73.6%) were married, while the mean age was 32.58±9.91, with an age range of 18 to 64 years. Slightly over half of the respondents (53.6%) gave birth two or more times, with mean parity of 2 (SD+2.2). About 53.6% of the respondents attended at least a primary school. Protestant was the dominant religion among the study participants (71.9%). Occupationally, the majority (54.21%) were housewives (Table 1).

Table 1. Socio-demographic characteristics of the study participants (n=356).

Age	Frequency	Percent
18.00 - 25.00	110	30.9
26.00 - 35.00	118	33.1
36.00 - 45.00	94	26.4
46.00 - 55.00	25	7.0
56.00 - 75.00	9	2.5
Marital status		
Single	57	16.0
Married/Cohabitating	262	73.6
Divorced/Separated	15	4.2
Widowed	22	6.2
Religion (self-declared)		
Orthodox	40	11.2
Catholic	20	5.6
Protestant	256	71.9
Adventist	18	5.1
Muslim	22	6.2
Educational status		
Unable to read/write	104	29.21
Read & write,	61	17.13
Primary education	72	20.22
High School	55	15.45
Diploma	54	15.17
Bachelors' degree	7	1.97
Master degree and above	3	0.84
Occupation		
Business/merchant	30	8.43
Farmer	15	4.21
Government employee	35	9.83

House wife	193	54.21
NGO employee	6	1.69
Private/laborer	8	2.25
Retired	2	0.56
Student	67	18.82

Awareness about breast and cervical cancer

Overwhelmingly, 80.3% (286/356) of the respondents reported having awareness of breast and cervical cancer. The major source of information about breast and cervical cancer was health extension workers (HEWs), 37.1% (132/356), followed by other health workers, 29.2% (104/356), and electronic mass media, 24.7% (88/356). Schools were a rare sources of breast and cervical cancer related information. A considerable proportion 19.7% (70/356), did not give a response whether they had heard about cervical or breast cancer (Figure 2).

Knowledge of breast and cervical cancer

To assess the knowledge of breast and cervical cancer, a total of 16 questions were prepared, of which eight were prepared to measure breast cancer knowledge, and the remaining eight questions measure cervical cancer knowledge. For a correct response, one point and zero points for each wrong answer were given. Based on the summation score, a score ³50% was considered as having good knowledge about breast or cervical cancer. Accordingly, the majority (84.83%) of the respondents demonstrated limited knowledge about the breast cancer risk factors. Lack of basic knowledge of the fact that inherited gene defects (76%), a diet with lots of animal meat (78.10%), family history of breast cancer (76.10%), and use of oral contraceptives (76.10%) are risk factors for breast cancer is gravely concerning. In addition, 75% of the study participants believe that bigger breasts are a risk factor for breast cancer. Similarly, the majority of sample respondents (64.60%) indicated that they did not know that regular alcohol consumption increases their risk of breast cancer. It can be seen from the table that most of the respondents believe that breastfeeding (65.40%) and physical activity (59.70%) increase the risk of breast cancer (Table 2).

Table 2: Knowledge of study participants about breast cancer (n=356)

Item	Category	Frequency	Percentage
[a]Do you think inherited gene defects can cause breast cancer?	I don't know	272	76.40
	Yes	84	23.60
[a]Do you think you are more likely to get breast cancer if someone in your family has it?	I don't know	271	76.12
	Yes	85	23.88
[a]Do you think the oral contraceptive is a risk factor for breast cancer?	I don't know	271	76.12
	Yes	85	23.88
[a]Do you think a diet with lots of animal meat is a risk factor for breast cancer?	I don't know	278	78.09
	Yes	78	21.91
[a]Do you think breastfeeding makes it less likely to get breast cancer?	I don't know	232	65.17
	Yes	124	34.83
[a]Do you think alcohol is a risk factor for breast cancer?	I don't know	230	64.60
	Yes	126	35.40
[a]Do you think exercise makes it less likely to get breast cancer?	I don't know	212	59.70
	Yes	143	40.30
[b]Do you think bigger breasts are a risk factor for breast cancer?	I don't know	89	25.00
	Yes	267	75.00
Knowledge about breast cancer	Poor	302	84.83
	Good	54	15.17

[b]The correct response for this question was "No."; [a]The correct response for these questions was "Yes."

In sharp contrast to that of breast cancer, it was found that only 38.76% have a knowledge gap about the risk factors of cervical cancer. Over 84.3% (300/356) believed that it can be cured if diagnosed early. Above half (51.4%) of the sample respondents identified HIV and/or human papillomavirus (HPV) as risk factors for cervical cancer (Table 3).

Table 3: Knowledge of study participants about cervical cancer (n=356)

Item	Category	frequency	Percentage
Is cervical cancer preventable?	I don't know	103	28.5
	Yes	253	71.5
Is having many different sexual partners a risk factor?	I don't know	103	28.9
	Yes	253	71.1
Do you know cervical cancer can be cured if diagnosed early?	I don't know	56	15.7
	Yes	300	84.3
Is smoking a risk factor for cervical cancer?	I don't know	189	53.1
	Yes	167	46.9
Is giving birth to many babies a risk factor?	I don't know	181	50.8
	Yes	175	49.2
Are HIV and/or human papilloma virus (HPV) risk factors for cervical cancer?	I don't know	173	48.6
	Yes	183	51.4
Is oral contraception a risk factor for cervical cancer?	I don't know	95	26.7
	Yes	261	73.3
Are you more likely to get cervical cancer if your family has it?	I don't know	290	81.5
	Yes	66	18.5
Knowledge about cervical cancer	Poor	138	38.76
	Good	218	61.24

Attitude of the participants towards breast and cervical cancer

A staggeringly high proportion of the study participants are scared of hearing about breast cancer (82.8%). About 57.9% believe having breast cancer would threaten a relationship with their boyfriend, husband, or partner. About 56.2% of the study participants prefer a female health worker to conduct breast exams (Table 4).

The overall attitude of the study participants towards breast cancer was assessed using a Likert-like *scale* where a negative response was scored as “1”, a not certain response was scored as “2,” and a positive response was scored as “3,” indicating a positive attitude towards the variable under investigation. Accordingly, the overall score of attitude of the study participants towards breast cancer was negative (2.26 ± 0.34) (Table 4).

Table 4: Attitudes of the study participants towards breast cancer (n=356).

Item	Yes	Not sure	I don't know	Mean Score ±SD
I feel it is likely that I will get breast cancer sometimes during my life	18 (5.1%)	130 (36.5%)	208 (58.4%)	2.53±0.59
My chances of getting breast cancer in the next few years are high/great	17(4.8%)	78 (21.9%)	261 (73.3%)	2.69±0.56
The thought of breast cancer scares me	295 (82.8%)	20 (5.6%)	41 (11.5%)	1.29±0.66
Problems I would experience with breast cancer would last a long time	168 (47.2%)	99 (27.8%)	89 (25%)	1.78±0.82
Breast cancer would threaten a relationship with my boyfriend, husband, or partner	206 (57.9%)	52 (14.6%)	98 (27.6%)	1.70±0.87
If there is cancer development in my destiny, having a breast examination will not help to prevent it	84 (23.6%)	86 (24.2%)	186 (52.2%)	2.29±0.82
Having mammography (low-dose X-ray breast examination) will help me find small breast lumps early	171 (48%)	39 (11%)	146 (41%)	1.93±0.94
I am afraid to have a mammogram because I might find out something is wrong & don't understand what will be done	44 (12.4%)	57 (16%)	255 (71.6%)	2.59±0.70
I have other problems more important than having breast exams in my life	18 (5.1%)	70 (19.7%)	268 (75.3%)	2.70±0.56
Health care workers doing breast exams are rude to women	19 (5.3%)	75 (21.1%)	262 (73.6%)	2.68±0.57
Having breast exams is too painful	40 (11.2%)	77 (21.6%)	239 (67.1%)	2.56±0.69
Having breast exams takes too much time	51 (14.3%)	83 (23.3%)	222 (62.4%)	2.48±0.73
If I developed breast cancer, I would not live longer than 5 years.	55 (15.4%)	89 (25%)	212 (59.6%)	2.44±0.75
There is no health center close to my house for breast exams	97 (27.2%)	75 (21.1%)	184 (51.7%)	2.24±0.86
I prefer a female health worker to conduct breast exams.	200 (56.2%)	57 (16%)	99 (27.8%)	1.72±0.87
I will never have breast exams if I have to pay for them.	49 (13.8%)	81 (22.8%)	225 (63.4%)	2.50±0.73
It is embarrassing to have my breasts examined	105 (29.5%)	27 (7.6%)	224 (62.9%)	2.33±0.90

I am too old to have breast exams regularly	89 (25%)	68 (19.1%)	199 (55.9%)	2.31±0.85
Summary	Agree (26.92%)	Neutral (19.72%)	Disagree (53.36%)	2.26±0.34

About 57.6% of the study participants never feel it is likely that they will get cervical cancer sometime during their life and 72.5 % do not believe that there is a high chance of getting cervical cancer in the next few years. Over 82.6% women found the issue of cervical cancer is scary to them (Table 5).

The overall attitude of the study participants towards cervical cancer was also assessed. Accordingly, the overall score of attitude of the study participants towards cervical cancer was negative (2.28 ± 0.33) (Table 5).

Table 5. Attitudes of study participants towards cervical cancer (n=356).

	Yes	Not sure	I don't know	Mean Score ±SD
I feel it is likely that I will get cervical cancer sometime during my life	16 (4.5%)	135 (37.9%)	205 (57.6%)	2.53±0.58
My chances of getting cervical cancer in the next few years are high/great	13 (3.7%)	85 (23.9%)	258 (72.5%)	2.69±0.54
The thought of cervical cancer scares me	294 (82.6%)	12 (3.4%)	50 (14.0%)	1.31±0.71
Problems I would experience with cervical cancer would last a long time	151 (42.4%)	87 (24.4%)	118 (33.1%)	1.91±0.87
Cervical cancer would threaten a relationship with my boyfriend, husband or partner	212 (59.6%)	53 (14.9%)	91 (25.6%)	1.66±0.86
If there is cancer development in my destiny, having cervical exams will not help to prevent it	101 (28.4%)	66 (18.5%)	189 (53.1%)	2.25±0.87
Having PAP smear/VIA/regular screening tests will help me find precancerous cells in my cervix early	180 (50.6%)	27 (7.6%)	149 (41.9%)	1.91±0.96
I am afraid to have a PAP smear/VIA/regular screening tests because I might find out something is wrong or don’t understand what will be done	43 (12.1%)	60 (16.9%)	253 (71.1%)	2.59±0.70
There is no health center close to my house to have cervical exams	28 (7.9%)	14 (3.9%)	314 (88.2%)	2.80±0.56
I have other problems more important than having cervical exams in my life	18 (5.1%)	80 (22.5%)	258 (72.5%)	2.67±0.57
Health care workers doing cervical exams are rude to women	20 (5.6%)	75 (21.1%)	261 (73.3%)	2.68±0.58
Having cervical exams is too painful	40 (11.2%)	102 (28.7%)	214 (60.1%)	2.49±0.69
Having cervical exams takes too much time	44 (12.4%)	109 (30.6%)	203 (57.0%)	2.45±0.70
If I developed cervical cancer, I would not live longer than 5 years	77 (21.6%)	91 (25.6%)	188 (52.8%)	2.31±0.81

I prefer a female health worker to conduct cervical exams	222 (62.4%)	41 (11.5%)	93 (26.1%)	1.64±0.87
I will never have cervical exams if I have to pay for it	41 (11.5%)	103 (28.9%)	212 (59.6%)	2.48±0.69
I would be ashamed to lie on a gynecologic examination table and show my private parts to have a cervical exam	100 (28.1%)	26 (7.3%)	230 (64.6%)	2.37±0.89
I am too old to have cervical exams regularly	83 (23.3%)	53 (14.9%)	220 (61.8%)	2.38±0.84
Summary	1683 (26.3%)	1219 (19.0%)	3506 (54.7%)	2.28±0.33

Predictors of Knowledge towards breast cancer

Bivariate logistic regression was used to assess the association between each independent variable and dependent variable. Hence the level of the respondent's knowledge with age, educational background, and information about breast cancer were associated. Similarly, the multivariate regression analysis revealed that P < 0.05 age, educational background, and information about breast cancer were found to have an association with knowledge of breast cancer

Of the total 356 sample respondents whose 18-25 years were 5.23 times [AOR=5.22; 95%CI; 1.72-15.90] more likely to have knowledge than age above 45 years. Women with primary education were 4.96 times [AOR=4.96; 95%CI (2.15-11.48)], women with secondary education 7.38 times [AOR=7.38(3.20-17.03)] and women with diploma or higher education 6.54 times [AOR = 6.54; 95% CI: 2.90-14.73]) are more likely to have breast cancer knowledge than illiterate women. The odds of good knowledge among rural households have information access from multiple sources about breast cancer was 3.21 times higher [AOR= 3.21, 95%CI, 1.66-6.21] than those who did not have information about the cancers (Table 6).

Table 6. Factors associated with good knowledge of breast cancer: results of multivariable logistic regression analyses.

Dependent variable: Good knowledge	Knowledge of Breast cancer		Crude OR (95%CI)	Adjusted OR (95%CI)
	Poor	Good		
Age in years				
Age of the respondent (Reference: >45)	63	47		
Age of the respondent (1=18-25 years)	81	35	4.78(1.34-17.08)*	5.22(1.72-15.90)*
Age of the respondent)2=26-35 years)	84	14	2.74(0.81-9.29)	3.03(0.99-9.27)
Age of the respondent (3=36-45 years)	28	4	1.65(0.45-6.02)	1.17(0.36-3.84)
Education status: Women				
Education: Reference: illiterate	88	10		
1=Read and write	59	13	1.67(0.66-4.25)	1.94(0.80-4.71)
2=some primary	39	22	2.96(1.20-7.32)*	4.96(2.15-11.47)**
3=Some secondary	31	26	4.2(1.67-10.55)*	7.38(3.20-17.03)**
4= Diploma and above	39	29	3.40(1.39-8.31)*	6.54(2.91-14.73)**
Access to information (Reference ;0=No)	78	12		
Access to information(1=yes)	178	88	2.11(1.01-4.42)*	3.21(1.66-6.21)**
Marital status				
Marital status; Reference widowed	18	5		
Marital status(1=single)	27	23	0.76(0.19-2.97)	3.07(0.98-9.55)
Marital status(2=married)	201	65	0.73(0.23-2.33)	1.16(0.42-3.26)
Marital status(3=separated)	10	7	1.77(0.38-8.14)	2.52(0.63-10.54)

*P<0.05; ** P<0.01

Preventive practices against breast and cervical cancer

A handful proportion of the study participants 40.7% (145/356) had a belief that both cancer forms are curable while 22.8% (81/356) had a belief that both cancer forms are treatable. Significant proportion (19.4%) considers cancer as the “curse of God” (Figure 3).

Upon assessing the preventive practices of the study participants, it was found that only 32% reported practicing breast self-examination (114/356). However, a massive proportion 96.07% (342/356) were

found to be willing to participate in a national cervical cancer screening program.

Discussion

This research revealed considerable gaps in knowledge and preventive practices concerning breast and cervical cancer among rural women. Although awareness was relatively high, detailed understanding of risk factors and prevention strategies was limited. These findings are consistent with previous studies conducted in Ethiopia and other sub-Saharan African countries [16, 17].

The study showed that health extension workers (HEWs) and health facilities contributed considerably to women's awareness, highlighting the critical role of national primary healthcare system in public health outreaching activities including public education. In rural parts of the country, HEWs serve as frontline healthcare providers and trusted community educators, particularly for maternal and reproductive health services [18]. The HEWs involvement in disseminating information about breast and cervical cancers may enhance awareness and facilitate screening uptake at the community level [19].

Electronic mass media was one of prominent sources of information about breast and cervical cancers among the study participants. This suggests that mass media including social media platforms play a substantial role in spreading cancer-related information in rural communities where access to specialized health services and formal health education remains limited. Similar findings have been reported in Southern Ethiopia, where mass media was identified as one of the main source of information regarding breast and cervical cancers among rural residents [20]. Again, studies demonstrated that women exposed to media messages were more likely to have heard about breast and cervical cancers and screening services compared to those without media exposure [21]. These findings underscore culturally appropriate radio and television campaigns to improve community awareness and early health-seeking behaviors related to cancer prevention and screening should be strengthened.

The present finding revealed that the role of schools as a source of information about breast and cervical cancers was very insignificant. This may be attributed to the inadequate integration of reproductive and cancer-related health education within the Ethiopian school curriculum and thus it is a missed opportunity [22]. Another explanation could be large proportion of rural women may have dropped out of formal education at an early age [23]. This once again necessitates comprehensive cancer related education at community level especially in rural parts of the country.

In many developing countries, school health programs primarily focus on sanitation, communicable diseases, and basic reproductive health topics of cultural relevance, cancer and other non-communicable diseases receive minimal attention [24]. Previous studies in Ethiopia have similarly documented inadequate community knowledge and limited screening practices despite the presence of HEWs, suggesting the need for strengthened training of health workers and integration of cancer education into school curriculum, religious organizations, and other community-based platforms [25].

The report that over 82 %) of the study participants are scared of hearing about breast cancer and cervical cancer is very concerning. This is higher than other study reported from Ethiopia (70.3%) [26]. Breast and cervical cancers are perceived as scary by women, particularly in low-resource and rural settings because the disease is associated with tremendous suffering, desperateness and ultimate death because many women encounter patients mostly at advanced stages of cancer. Studies from sub-Saharan Africa have shown that prolonged suffering, pain, and fear of death strongly influence women's perceptions of cancer and discourage timely healthcare seeking [27]. Other explanation could be lack of adequate awareness and widespread misconceptions. About 19.4% of the study participants perceive cancer as the "curse of God". This beliefs further increase anxiety and stigma surrounding the disease and thus necessitates comprehensive awareness creation activities. A systematic review in Ghana, in agreement with the present findings, described cancer resulted from curses from the gods for wrongdoing [28].

Concerning the awareness about the risk factors for the cancers, the current study revealed mixed outcomes. For instance, the awareness of alcohol consumption as a risk factor for breast cancer was higher (35.4%) when compared to previous report elsewhere (only 24.6%) [29]. Again, the proportion that breastfeeding (34.6%) and physical activity (40.3%) reduce the risk of breast cancer are higher than the previous reports [26, 30]. Among the total participants, 57.6% and 59.6% believed that breast cancer and cervical cancer, respectively, could threaten marital or partner relationships. This proportion is higher than findings reported in previous studies conducted in Ethiopia [26].

In the study, younger age (18-25 years old), diploma or higher education and access to information are strongly associated with cancer knowledge. This finding indicate the higher odd over the previous report from central Ethiopia [30]. Generally, it is believed that older women may have better cancer-related knowledge due to cumulative exposure to healthcare services and reproductive health information acquired throughout their lifetime. However, these days younger women may demonstrate higher awareness about cancers due to better access to information and digital media exposure. The finding is in agreement with other reports from Ethiopia and Africa [16, 31].

Preventive practices such as breast self-examination (32%) and willingness of participants to national cervical cancer screening (96.07%) are encouraging and should properly be exploited. This low breast self-examination practice may be attributed to limited practical knowledge, inadequate exposure to practical demonstrations by healthcare providers, lack of self-assurance in performing self-examination, and fear of discovering disease. The current breast self-examination prevalence, though low, is within the pooled estimate of breast self-examination in Ethiopia [32]. Whereas, willingness to participate in the national cervical cancer screening is higher than most countries worldwide including China (84%) [33], India (25%) [34], and USA (55%) [35]. This high willingness could be due to the screening opportunities are scarce in comparison to developed countries, and women in developing countries may

perceive screening as a highly important health service that is currently inaccessible. Another reason could be perceived disease severity and fear of cancer thus increase women's motivation and willingness to participate in preventive programs such as national screening campaigns [36, 37].

The cross-sectional design of the current study limits the ability to establish causal relationships between the variables. In addition, the study relied on self-reported information obtained from reproductive-age women, which may have introduced reporting and recall biases.

Conclusion

An overall knowledge of risk factors for breast and cervical cancer among women was low. Majority believe in the importance of early diagnosis for better management of both cancer forms. Educational status, access to information and poor attitude are the most important barriers to access and care for both cancer forms. Therefore, it should be addressed through integrated strategies including curriculum-based education in schools, awareness creation campaigns, and proper use of mass media outlets. Culturally appropriate community education involving religious leaders, community influencers, and HEWs are essential to overcome myths and misconceptions and to promote evidence-based understanding of breast and cervical cancers. Such interventions can enhance access to accurate health information, improve community awareness, and ultimately encourage early healthcare-seeking behavior and utilization of preventive services. In addition, regular cancer screening campaigns/programs should be in instituted and thus increase access. Finally, additional research to further understand and assess the effectiveness of different strategies to increase knowledge and improve attitudes is needed.

Abbreviations

AOR	Adjusted Odds Ratio
CI	Confidence Interval
HEWs	Health Extension Workers
HPV	Human Papillomavirus
KAP	Knowledge, Attitude, Practice
SNRS	Sidama National Regional State
VIA	Visual Inspection with Acetic Acid

Declarations

Ethics Approval and Consent to Participate

The research ethical review committee of Hawassa College of Teacher Education reviewed and approved the study protocols (Ref. №: HCTERC/002/2023). Written informed consent was obtained from all participants before data collection and study enrollment. All information gathered was treated confidentially, and the names of all participants were kept anonymous. All direct personal data and indirectly identifiable data were deleted. Principles stated in the Declaration of Helsinki were followed during the conduct.

Consent for publication - Not applicable

Clinical trial number – Not applicable.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Competing interests - The authors declare that they have no competing interests.

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Authors' contributions

NT conceived and designed the study, collected the data, critically drafted the manuscript, revised and approved the final version. MR and TA contributed to study design, collected and interpreted the data and approved final version.

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Figures

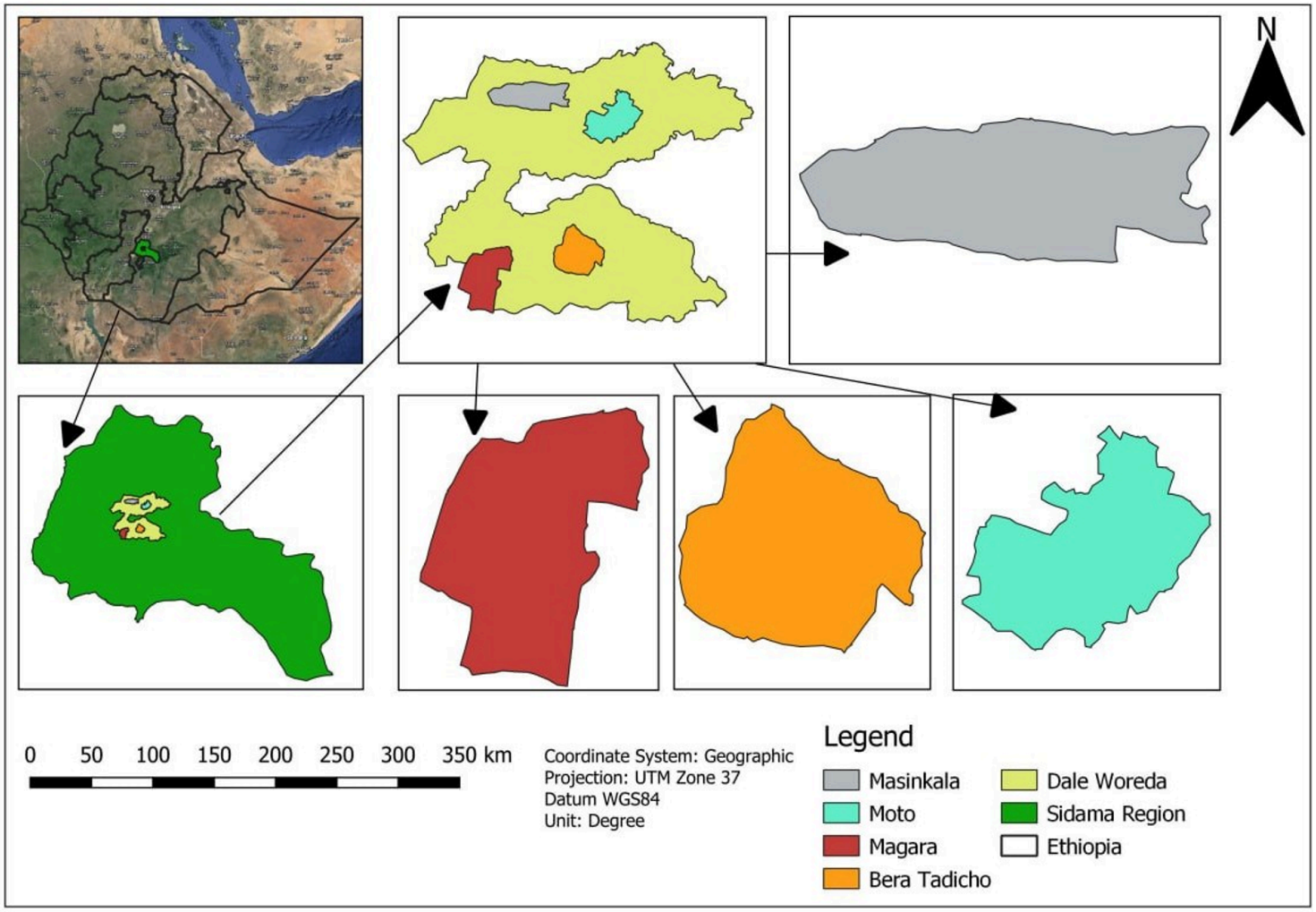


Figure 1

The map showing the geographical location of Dalle district, Sidama national Regional State, Ethiopia. The map was generated using QGIS. Administrative boundary data were obtained from GeoBoundaries and are distributed under the Creative Commons Attribution 4.0 International License (CC BY 4.0).

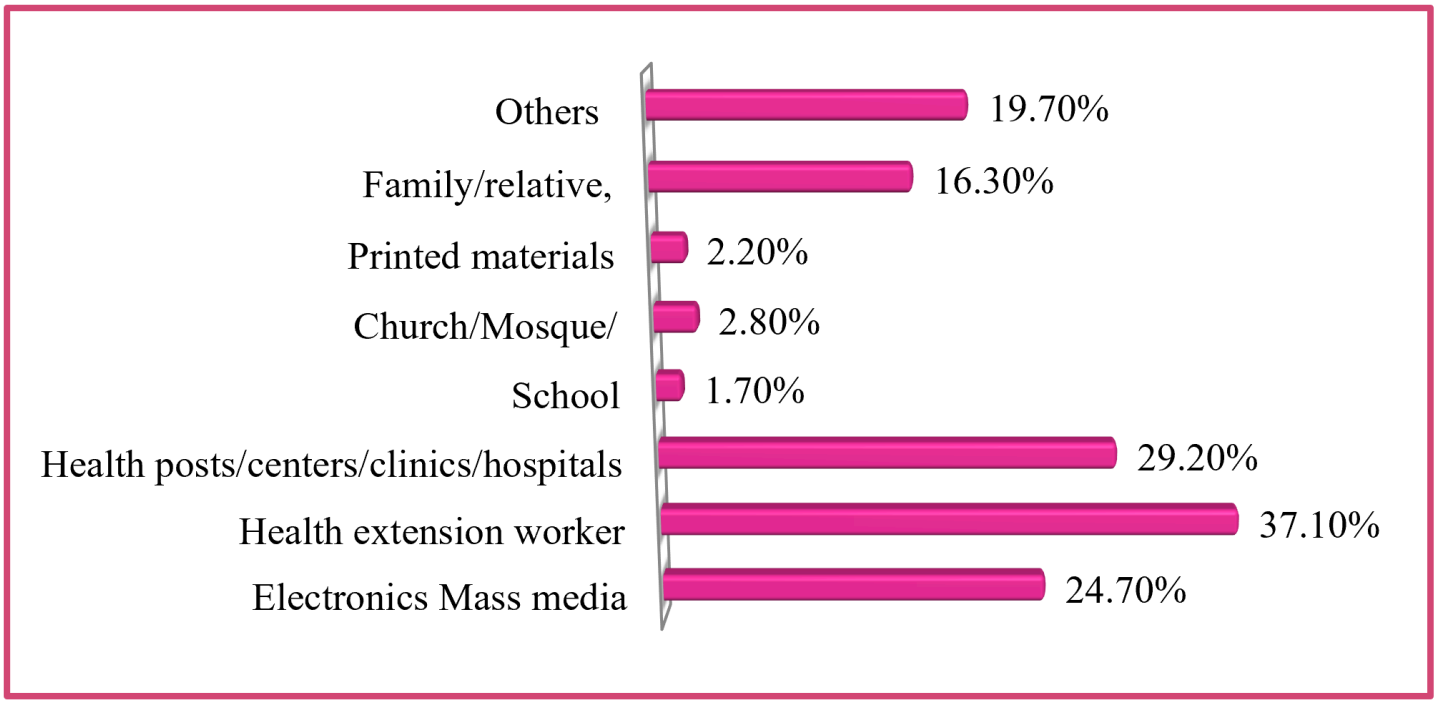


Figure 2

Source of information about breast and cervical cancers among reproductive-age women in the rural setting of SNRS, Ethiopia, 2025.

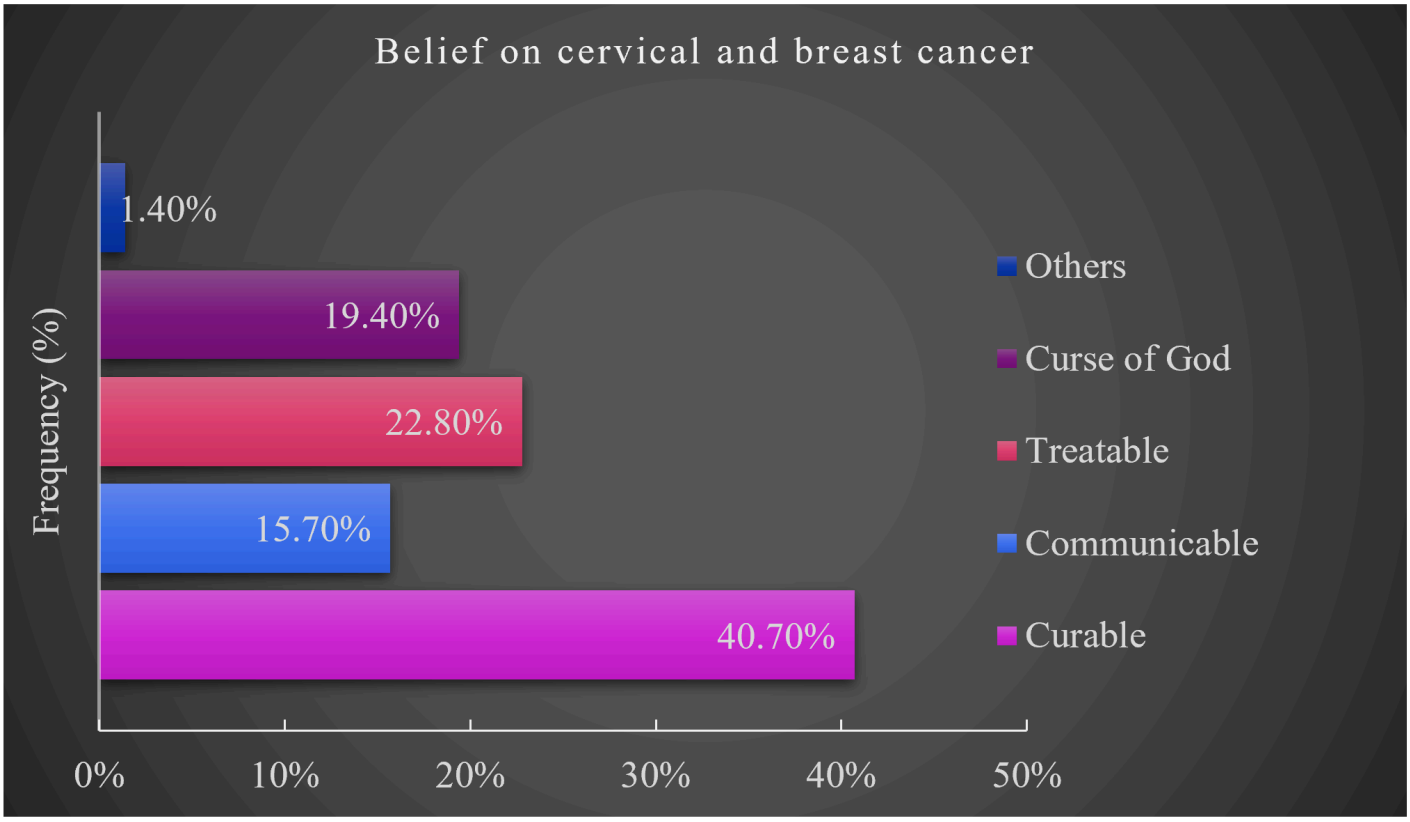


Figure 3

Belief on cervical and breast cancer among the study participants in Dale District, SNRS, Ethiopia, 2025