

# Knowledge of breast cancer risk factors and preferred indigenous language information sources among women in lagos, Nigeria

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# Abstract

The audience's inclination towards a particular communication medium heavily influence their knowledge and attitudes towards breast cancer risk factors. Studies that have hitherto been conducted on breast cancer have mostly ignored women's awareness of risk factors and information sources in favor of prevalence rates and clinical analyses. This study investigated how information sources, including Indigenous language sources, were used for breast cancer risk factors in Lagos State. A cross-sectional survey was employed in eliciting information from 389 women randomly selected from four selected LGAs in Lagos State with the aid of a multi-staged sampling technique. Findings revealed that although internet-related platforms such as social media and websites were the predominant channels through which respondents accessed information on breast cancer risk factors, many women had little to no understanding of these risk factors. The study also found that respondents depicted a positive attitude towards breast cancer risk factors, as 72.3% were willing to conduct breast selfexaminations, and 74.8% were willing to consult a medical doctor in case of a breast lump. Furthermore, findings showed that out of the six information sources examined, the internet/websites had the highest predictive value at a standardized coefficient (beta) of 0.243, followed closely by health workers regarding risk factor knowledge. Similarly, internet/websites had the most predictive value at a standardized coefficient (beta) of 0.404, followed closely by health workers at a beta value of 0.355 regarding attitude. The study highlights the need for breast cancer awareness campaigns to incorporate Indigenous language communication to improve comprehension and accessibility of breast cancer risk information. Health messages framed in Indigenous languages can enhance understanding, particularly among women with limited literacy in dominant languages. This study recommends that breast cancer awareness campaigns be initiated with messages framed positively, emphasizing risk factors and symptoms while leveraging Indigenous language communication channels to reach a broader audience effectively.

Keywords: Breast cancer risk factors, Indigenous Language, Information sources, Knowledge, Preferred information source.

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**Transparency:** The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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#### **1. Introduction**

The burden of cancer is high globally, with effects on the mental, social, and physical well-being of people. More burdensome is breast cancer, which has exerted a negative impact on the human population. According to the World Health Organization [1] 2.3 million women worldwide received a breast cancer diagnosis in 2020, and 685,000 of them passed away. Breast cancer has been the most common disease in the world by the end of 2020, with 7.8 million women having received a diagnosis in the preceding five years [2]. Consequently, breast cancer affects 2.1 million women yearly and accounts for the majority of women's cancer-related fatalities [3].

Furthermore, Azubuike [4] observed that mortality figures are high in Africa, as the continent had the world's highest age-standardized death rate for breast cancer. The findings also revealed that Africa's previously low breast cancer incidence rate increased over time. Breast cancer incidences were previously low in Nigeria but are increasingly growing as a consequence of urbanization and lifestyle changes, and it currently accounts for around 23% of all cancer diagnoses and nearly 18% of all deaths in the country, making it the main cause of cancer mortality [5].

Breast cancer has a variety of risk factors. Certain risk factors are well-known, such as family history and age. Research over the past decade has further underlined the importance of hormones and the identification of genes associated with breast cancer risk (e.g., BRCA1, BRCA2) [6-8]. Regardless of the facts about the hazards of breast cancer, many women have a poor awareness of the disease's origins and a limited sense of their own personal risk. Many women rely on information sources to obtain health information; however, mainstream and general-interest sources like the media sometimes distort risk factors [9]. Breast cancer risk factors and individual risk perception are important behavior motivators for preventing, detecting, and managing the illness.

Various researchers have also indicated that one's level of awareness about breast cancer might influence early diagnosis screening habits [10-12]. Poor screening procedures are linked to a lack of breast cancer awareness [13]. Recent studies indicate that women have a low understanding of risk indicators and risk perception [14, 15]. Therefore, it is crucial for people to feel motivated to detect, prevent, and manage diseases by being aware of risk factors and perceiving their own risk [16].

In a world regulated and controlled by technology, information is widely accessible. However, individuals still determine the sources they prefer and trust. The ability to comprehend and recall health messages, including breast cancer risk factors, depends on the target audience's familiarity with and preference for the communication channel being used [17]. For many women, Indigenous languages play a crucial role in how they understand and process health-related messages. Language is not just a medium of communication but also a cultural bridge that enhances message clarity and relatability. Previous studies have suggested that health messages delivered in Indigenous languages improve comprehension and trust, leading to better health-seeking behaviors [18]. Knowing the content and sources of breast cancer communication that resonate most with women, particularly in Indigenous languages, will help future outreach efforts be more effective. As a result, effective communication channels must be established that are both accessible and culturally relevant.

Therefore, this research aims to scrutinize the information sources used in accessing breast cancer risk factor messages, assess knowledge of breast cancer risk factors, ascertain women's attitudes towards breast cancer risk factors, and investigate the preferred information sources, including Indigenous language sources, among women in Lagos State.

# 1.1. Research Objectives

The research objectives of this study are:

- 1. To investigate the indigenous information sources women in Lagos state employed in assessing messages on breast cancer risk factors
- 2. To assess women's knowledge of breast cancer risk factors in Lagos state.
- 3. To investigate women's attitudes towards breast cancer risk factors in Lagos state

## 1.2. Hypotheses

H<sub>1</sub> - There is no significant relationship between information sources and knowledge of breast cancer risk factors

H<sub>2</sub> - There is no significant relationship between information sources and women's attitude towards those sources.

# 2. Methodology

#### 2.1. Study Design

This study employed the descriptive research design. It is descriptive because it shows the relationship or correlation between variables and how they relate to each other as it naturally occurs [19]. The descriptive method was adopted in scrutinizing the information sources used in assessing breast cancer risk factor messages; knowledge of breast cancer risk factors; ascertain women's attitudes towards breast cancer risk factors; and investigate the preferred information sources among women in Lagos state.

The population of this study included women in Lagos state, Southwest Nigeria. The choice of Lagos is premised on the 2009-2016 report of the Nigeria National System of Cancer Registries (NSCR), which ranks Lagos as the state with the highest preponderance cases of Breast cancer and ranks it as the second state with the most prevalent cases of Breast cancer in Nigeria. Lagos is the second most populous state in Nigeria and has been described as the commercial hub of the country [20-22]. The women population of Lagos has been estimated to be 5,295,476 [23]. Furthermore, Fapohunda, et al. [24] has observed that the most common cancer type among women is breast cancer. A further validation is the reason being an increase in the advocacy campaigns against Breast cancer and also its eradication in Lagos state. Such campaigns have been carried out by Run For A Cure Africa Breast Cancer Foundation, Breast Without Spots (BWS), Innovating Health & Cancer Care Foundation, Pink Africa Initiative, Nigeria National System of Cancer Registries (NSCR) civil Society for Cancer Eradication in Nigeria (CISCANEN).

#### 2.2. Sample Size and Technique

Although scholars have no unanimous decision on how large the sample size should be Keyton and Beck [25]. For this study, 384 respondents were selected from the sample drawn from 2 out of the 3 senatorial districts in Lagos state. The justification for this sample size was derived according to the formula by Fishers et al.'s (1983), as cited by Mugenda and Mugenda [26] was used.

#### 2.3. Sampling Technique

For this cross-sectional study, the large population of Lagos state were delimited to a manageable size using multi stage sampling technique.

In the first stage of selection, the simple random technique was harnessed in selecting two out of the three senatorial districts in Lagos state (Lagos-Central and Lagos-East). At the second stage, the simple random technique was utilized in selecting two local governments each from the senatorial districts making a total of 4 local governments- Surulere and Etiosa constituency; Ikeja and Agege, responsively. Then the third stage involved the usage of simple random technique in selecting two wards each from the identified local government, totaling 8 wards.

At the fourth stage of selection, the simple random technique was used in selecting two streets each from the wards making it a total of 16 streets. In the last stage, streets were stratified into residential houses where women reside in order to administer the questionnaire. The researcher also, made use of systematic sampling technique in selecting residential houses that fell within the sample. To do this, the researcher determined which person in the household should answer the questionnaire by using a form of random-numbers table.

#### 2.4. Method of Data Presentation and Analysis

Descriptive statistics data express in frequency, percentage and cross tabulation was utilized in describing the demographic characteristics of respondents as well as the use of information sources by respondents. This study employed the three levels of analysis namely univariate, bivariate and multivariate. Hence, the quantitative data generated from this study were organized with the aid of statistical product and service solution (SPSS) version 23. Furthermore, the Smart PLS statistical tool was used to test the hypotheses in order to establish the significance of the independent factors' effects on the dependent variables.

## 2.5. Ethical Clearance

An ethical clearance was obtained from Covenant Health Research Ethics Committee with the number CHREC /132/2022. Furthermore, all the participants were informed about the set objective of the study. They were allowed to discontinue their participation at any level without providing a reason(s) for the decision. Therefore, only those who are willing participated in the survey.

# 3. Results

3.1. Demographic Data of Respondents

 Table 1.

 Demographic data

	Percentage	
Age		
18-29 years	24.7	
30-41 years	33.7	
42-53 years	29.3	
54-59 years	12.3	
Total	100	
Marital status		
Single	31.3	
Married	62.5	
Others	6.2	
Total	100	
Religion		
Christianity	77.4	
Islam	21.3	
Traditional	1.3	
Total	100	
Educational qualification		
Primary education	2.1	
Secondary education	19.3	
Tertiary education	78.7	
Total	100	
Occupation		
Students	10.5	
Artisans	9	
Businesswomen	26.5	
Employed	42.9	
Unemployed	11.1	
Total	100	

Table 1 shows the respondents' demographic information. This cuts across age, marital status, religion, education level and occupation. The respondents' age distribution reveals that the majority of them (33.7%) were within the age bracket of 30-41. The marital status of the respondents shows majority of responders were married. Meanwhile, the finding also revealed that majority 42.9% were employed either by government or private organisations.





Figure 1.

What is the predominant channel you heard about Breast cancer risk factors?.

The researcher's focus also was in examining the primary information sources of knowledge that respondents usually explore to seek information about breast cancer risk factors. It was discovered that the most predominant channel of information was the internet and websites, which accounted for 30.3%, followed by health workers, which represented 19%. Also, television and family/friends accounted for 15.5% each, followed by radio which accounted for 12.1 while the newspaper was the least, representing 5.7%. This implies that the internet has contributed significantly to the awareness of breast cancer in Nigeria.



Figure 2.

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How often do you read / watch/ hear about Breast cancer risk factors?.

Figure 2 shows that 18.8% of the respondents read / watch/ hear about Breast cancer risk factors very often, 22.4% oftentimes read / watch/ hear about Breast cancer risk factors, 35.2% rarely read / watch/ hear about Breast cancer risk factors, 5.1% never read / watch/ hear about Breast cancer risk factors while 18.5% of the respondents read / watch/ hear about Breast cancer risk factors. This can be attributed to the fact that there is not enough breast cancer awareness solely focused on breast cancer risk factors.

Knowledge	e of Breast Cancer Risk Factor.							
S/N	ITEMS	SA	Α	D	SD	Mean	SD	
1	A family history of breast cancer cannot	142	138	82	26	2 5 2 0	1 120	
	cause breast cancer.	(36.8)	(35.5)	(21.1)	(6.7)	2.320	1.120	
2	Early menstruation (< 12 years) cannot	139	152	59	39	2 5 6 0	1 104	
	cause breast cancer.	(35.7)	(39.1)	(15.2)	(10.0)	2.309	1.194	
3	Late menopause (> 55 years) cannot	127	135	72	55	2 5 1 4	1 022	
	cause breast cancer.	(32.6)	(34.7)	(18.5)	(14.1)	2.314	1.022	
4	Poor eating lifestyles cannot cause breast	105	169	34	81	2 621	1.062	
	cancer.	(27.0)	(43.4)	(8.7)	(20.8)	2.051	1.005	
5	Excessive alcohol intake cannot cause	132	148	44	65	2 610	1.052	
	breast cancer.	(33.9)	(38.0)	(11.3	(16.7)	2.010	1.032	
6	Obesity cannot cause breast cancer.	102	166	76	45	0.504	1.071	
		(26.2)	(42.7)	(19.5)	(11.6)	2.524	1.051	
7	Recent and long-term use of hormone	29	66	175	119			
	replacement therapy cannot cause breast	(7.5)	(17.0)	(45.0)	(30.6)	2.52	1.109	
	cancer.							
8	High-dose radiation and chemicals to the	17	64	145	163	2.62	1 170	
	chest cannot cause breast cancer.	(4.4)	(16.5)	(37.3)	(41.9)	2.02	1.170	
9.	Ageing cannot cause breast cancer.	126	157	67	39	2.76	1.001	
		(32.4)	(40.4)	(17.2)	(10.0)	2.70	1.091	
10.	Poor breast hygiene cannot cause breast	39	83	105	162	2.26	1.077	
	cancer.	(10.0)	(21.3)	(27.0)	(41.6)	2.20	1.077	

Table 2 shows the descriptive statistics on women's breast cancer risk factors knowledge. This was measured with ten items. It was in the researcher's interest to know if a family history of breast cancer cannot cause breast cancer, A family history of breast cancer cannot cause breast cancer, according to 142 (36.6%) of the respondents who strongly agreed with the statement. Of the remaining 138 (35.5%) respondents, who also agreed with the statement, while with a mean score of 2.520 and a standard deviation of 1.120, 82 (21.1%) and 26 (6.7%) respondents disagreed and strongly disagreed that a family history of breast cancer cannot cause breast cancer. Also, 139(35.7%) strongly agreed that early menstruation (< 12 years) cannot cause breast cancer, 152(39.1%) also agreed, while 59(15.2%) and 39(10.0%) disagreed and strongly disagreed that early menstruation (< 12 years) cannot cause breast cancer, 152(39.1%) of the respondents strongly agreed that late menopause (> 55 years) could not cause breast cancer accompanied by a means score of 2.514 and 1.022 as the standard deviation.

The study also intends to find out if poor eating lifestyles cannot cause breast cancer. 105(27%) of the respondents strongly agreed that poor eating lifestyles could not cause breast cancer, 169(43.4%) agreed with the statement, 34(8.7%) disagreed, while 81(20.8%) strongly disagreed that poor eating lifestyles cannot cause breast cancer with a mean score of 2.631 and standard deviation of 1.063.

The findings revealed that 102(26.2%) of the respondents strongly agreed that obesity cannot cause breast cancer, 166(42.7%) agreed with the statement, 74(19.5%) disagreed, while 45(11.6%) strongly disagreed that obesity cannot cause breast cancer with a mean score of 2.524 and standard deviation of 1.051. In addition, it was investigated whether recent and prolonged usage of hormone replacement treatment may result in breast cancer. Meanwhile, 126(32.4%) strongly agreed that ageing cannot cause breast cancer, 157(40.4%) agreed that ageing cannot cause breast cancer, 67(17.2%) disagreed, while 39(10%) strongly disagreed that ageing cannot cause breast cancer of 2.760 and standard deviation of 1.091. It was also discovered that most of the respondents, which accounted for 162(41.6%), strongly disagreed that poor breast hygiene cannot cause breast cancer; 105(27%) also disagreed with the statement. However, 39(10%) strongly agreed that poor breast hygiene cannot cause breast cancer, while 83(21.3%) agreed with the statement with a mean score of 2.260 and a standard deviation of 1.077.

Table 3.

S/N	ITEMS	SA	Α	D	SD	Mean	SD
1	I am willing to do a breast self-	138	143	26	82	2.067	1 077
	examination (BSE).	(35.5%)	(36.8%)	(6.7%)	(21.1%)	2.907	1.077
2	I am willing to consult a medical doctor in	152	139	59	39	2 757	1 100
	case of a breast lump.	(39.1%)	(35.7%)	(15.2%)	(10%)	2.131	1.109
3	I am willing to seek help immediately.	105	169	34	81	2 505	1.057
		(27%)	(43.4%)	(8.7%)	(20.8%)	2.393	1.037
4	I am willing to seek help when I start to	134	212	26	17	2 823	1.078
	experience deeper symptoms.	(34.4%)	(54.5%)	(6.7%)	(4.4%)	2.823	1.078
5	I am willing to seek alternative treatments,	119	128	72	70		
	e.g., spiritual healing or homoeopathy, in	(30.6%)	(32.9%)	(18.5%)	(18%)	2.984	1.127
	case of a breast lump.						
6	I am willing to do nothing in case of a	48	29	170	142	1 821	1.018
	breast lump	(12.4%)	(7.5%)	(43.7%)	(42.7%)	1.021	1.018

Attitude of Women Towards Breast Cancer Risk Factor

Table 3 displays the descriptive statistics on women's attitudes towards breast cancer risk factors. This was measured with six items. The study intends to determine if respondents are willing to do a breast self-examination. It was discovered from the results that 138(35.5%) of the respondents strongly agreed that they were willing to do a breast self-examination, 145(36.8%) agreed with the statement, 82(21.1%) disagreed, while 26(6.7%) strongly disagreed that they are willing to do a breast self-examination with a mean score of 2.967 and standard deviation of 1.077. It was also discovered that most of the respondents, which accounted for 152(39.1%), strongly agreed that they are willing to consult a medical doctor in case of a breast lump, and 139(35.7%) agreed with the statement. Moreover, 59(15.25%) disagreed with the statement, while 39(10.0%) strongly disagreed that they would be willing to consult a medical doctor in case of a breast lump, with a mean score of 2.757 and a standard deviation of 1.109.

In addition, the study sought to determine if women are willing to seek assistance instantly. The results revealed that most of the respondents, representing 169(43.4%), agreed with the statement, and 105(27%) strongly agreed. Meanwhile, 34(8.7%) and 81(20.8%) respectively disagreed and strongly disagreed that women will be willing to seek help immediately, with a mean sore of 2.595 and a standard deviation of 1.057. In addition, the study also revealed that 134(34.4%) strongly agreed that they would be willing to seek help when I start to experience deeper symptoms, 212(54.5%) agreed with the statement, 26(6.7%) disagreed with the statement while 17(4.4%) strongly disagreed that they will be willing to seek help when I start to experience deeper symptoms.

An effort was also made by the researcher to find out if respondents would be willing to seek alternative treatments, e.g., spiritual healing or homoeopathy, in case of a breast lump. It was revealed that 119(30.6%) strongly agreed that they would be willing to seek alternative treatments, e.g., spiritual healing or homoeopathy in case of a breast lump, 128(32.9%) agreed with the statement, 72(18.5%) disagreed while 70(18%) strongly disagreed with a mean score of 2.984 and standard deviation of 1.027. Besides, the findings also revealed that 48(12.4%) strongly agreed that the respondents would be willing to do nothing in case of a breast lump; 29(7.5%) also agreed with the statement. Nevertheless, 170 respondents (43.7\%), or the majority, disagreed with the assertion, while 142(42.7%) strongly disagreed that respondents would be willing to do nothing in case of a breast lump, with a standard deviation of 1.418 and a mean score of 1.821.

 $H_1$ : Information sources have no significant effect on women's knowledge of breast cancer risk factors.

Test of hypothesis one focused on the effect of information sources (television, radio, newspaper, family/friends, internet and health workers) on knowledge of breast cancer risk factors by women. A linear and multiple regression analysis was computed as depicted in <u>Table 4a</u> and Table 4b to determine whether information sources significantly affect the knowledge of breast cancer risk factors by women.

9.711

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# Table 4a.

Coefficients	1								
Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	R2	Adjusted	F	ANOVA (Sig.)
	В	Std.	Beta						
		Error							
(Constant)	2.449	0.093		26.256	0.000	0.138	0.134	7.503	0.006 <sup>b</sup>
Information	0.277	0.064	272	2 720	0.006				
Sources	0.277	0.004	.372	5.739	0.000				

## Linear Regression Coefficients of Hypothesis One

Note: a. Dependent Variable: knowledge of breast cancer risk factors

b. Predictor: Information Sources

#### Table 4b.

Multiple Regression Coefficients of Hypothesis One.

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Model	Unstandardis	Unstandardised Coefficients		t	Sig.	
	В	Std0. Error	Beta			
(Constant)	1.840	0.195		9.425	0.000	
Television	0.201	0.059	0.162	3.415	0.001	
Radio	0.083	0.071	0.077	1.172	0.242	
Newspaper	0.068	0.071	0.066	0.959	0.338	
Family/Friends	0.201	0.059	0.162	3.415	0.001	
Internet/website	0.234	0.058	0.243	4.036	0.000	
Health workers	0.244	0.063	0.236	3.889	0.000	
a. Dependent Variable: Women's	knowledge of breast	cancer risk factor	rs			
Model Summary and ANOVA						
-value		0.389				
R-Squared		0.151				
diusted R-Squared			0.1	38		

F-value P-value

Note: Dependent Variable: Women's knowledge of breast cancer risk factors

Predictors: (Constant), television, radio, newspaper, family/friends, internet and health workers

#### 3.3. Decision Rule

The R square is very weak from 0.0 to 0.20, moderate between 0.20 and 0.40, strong between 0.40 and 0.60, very strong between 0.60 and 0.80, and very strong above 0.80. Reject the null hypothesis if the significance value is less than 0.05. Rejecting the null hypothesis when the significance value is greater than 0.05 is not advised.

Table 4.5a exhibits the findings of hypothesis one's linear regression, which looked at the impact of information sources on the understanding of breast cancer risk factors by women. The value of R-squared from the linear regression findings was 0.138, indicating that information sources may explain 13.8% of the variance in awareness of breast cancer risk factors.

Shown in Table 4.5b are the results of hypothesis one's multiple regression, which concentrated on the relationship between information sources (television, radio, newspaper, family/friends, internet and health workers) and knowledge of breast cancer risk factors by women. The route coefficient values were used to estimate the amount and degree of correlation between information sources and women's awareness of breast cancer risk factors; the amount of variation in women's awareness of breast cancer risk factors as explained by information sources is determined by the r-square, and the level of probability is determined by the p-value. Sequel to Table 4.5b, the finding shows that information sources significantly influence the understanding of breast cancer risk factors at (R=389, R-squared =0.151 and p-value= 0.000 < 0.05). The value of 0.389 indicates that there is little correlation between women's awareness of breast cancer risk factors and the sources of such information. The R2 value of 0.151 implies that information sources may account for a variation in awareness of breast cancer risk factors of 15.1%.

Additionally, as shown in the model, the corrected R-squared value was 0.138, which suggests that 13.8 percent less variation may be attributed to the prognosis of information sources on awareness of breast cancer risk factors. This indicates that the information sources, i.e., television, radio, newspaper, family/friends, internet and health workers, jointly explain 13.8% of variations in the awareness of breast cancer risk factors. The rest, however, are explained by additional factors that the model does not take into account. The model may therefore be used to consistently examine the effect of information sources on understanding of breast cancer risk factors.

To determine if the model will considerably fit in forecasting the outcome using the mean, the variance analysis was applied. The F-ratio measures how much better the forecast is as a consequence of fitting the model as contrasted to how inaccurate the model is.

The F-ratio was 9.711 and was significant at (p<0.05), which implies that information sources (television, radio, newspaper, family/friends, internet and health workers) are jointly significant in explaining variations in the understanding of breast cancer risk factors. The model improved the capacity to foresee how different information sources will affect people's understanding of breast cancer risk factors.

Additionally, the model displays an estimate of  $\beta$  values. and gives an individual contribution of each predictor (information sources) to the model. The  $\beta$  value describes the relationship between breast cancer risk factors knowledge with each predictor (television, radio, newspaper, family/friends, internet and health workers). The positive  $\beta$  data suggests a favorable relationship between the predictor and the outcome. The regression model is depicted as follows:

 $\begin{array}{l} y_1 = \text{knowledge of breast cancer risk factors} \\ x_1 = \text{television} \\ x_2 = \text{radio} \\ x_3 = \text{newspaper} \\ x_4 = \text{family/friends} \\ x_5 = \text{internet/websites} \\ x_6 = \text{health workers} \end{array}$ 

The modified regression model is indicated below

 $y_1=\beta_0+\beta_1x_1+\beta_4x_4+\beta_5x_5+\beta_6x_6$   $y_1=1.840+0.201+0.202+0.234+0.244$ where:  $y_1=$  knowledge of breast cancer risk factors  $x_1=$  television  $x_4=$  family/friends  $x_5=$  internet/websites  $x_6=$  health workers

Note:  $x_2$  and  $x_3$  were not considered for the modified model because they do not contribute significantly to the model.

The model suggests that when all the predictors (television, radio, newspaper, family/friends, internet and health workers) are kept constant at zero, the understanding of breast cancer risk factors would be estimated to 1.843. A change in television would catalyze to a 0.201 surge in the knowledge of breast cancer risk factors in one unit. Similarly, one-unit change in family/friends, internet and health workers will lead to 0.201, 0.234 and 0.244 increment in the knowledge of breast cancer risk factors, respectively.

To determine if the predictors (television, radio, newspaper, family/friends, internet, and health workers) were making a meaningful contribution to the model, the t-test was investigated. The predictor significantly impacts the model when the t-test linked to the -values is significant. The value of significant declines as the contributor to that predictor increases (the larger the value of t). Radio and newspaper were statistically insignificant, according to the results. The results of the multiple regression analysis stated that television (t=3.415, p<0.05), family/friends (t=3.415, p<0.05), internet/websites (t=4.036, p<0.05) and health workers (t=3.889, p<0.05) are significant predictors of knowledge of breast cancer risk factors.

Specifically, out of the six information sources used in this study, it was discovered that the internet/websites have the most predictive value at the standardised coefficient (beta) value of 0.243, followed closely by health workers.

H<sub>2</sub>: Information sources have no significant influence on women's attitudes towards breast cancer risk factors.

Test of hypothesis two focused on the influence of information sources (television, radio, newspaper, family/friends, internet and health workers) on women's attitudes towards breast cancer risk factors. A linear and multiple regression analysis was computed as depicted in Table 5a and Table 5b to determine whether information sources significantly affect women's attitudes towards breast cancer risk factors.

Model	Unstandardised Coefficients		Unstandardised Standardised t Coefficients Coefficients		Sig.				
	В	Std.	Beta			R2	Adjusted	F	ANOVA
		Error							(Sig.)
(Constant)	2.450	0.101		27.112	0.000	0.203	0.200	29.093	0.000
Information Sources	0.306	0.070	0.450	4.370	0.000				

Table 5a.

Linear Regression Coefficients of Hypothesis Two.

Note: Dependent Variable: Attitudes towards breast cancer risk factors Predictor: Information Sources

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Multiple Regression Coefficients of Hypothesis Two.

Model	Unstandardi	sed Coefficients	Standardised Coefficients	t	Sig.
	В	Std. Error	Beta		
(Constant)	1.998	0.226		7.012	0.000
Television	0.070	0.039	0.074	1.813	0.070
Radio	0.016	0.031	0.018	0.950	0.950
Newspaper	0.045	0.034	0.049	1.333	0.187
Family/Friends	0.286	0.029	0.344	10.001	0.000
Internet/website	0.407	0.036	0.404	11.404	0.000
Health workers	0.388	0.030	0.355	10.033	0.000
a. Dependent Variable: Women's attitude	es towards breast canc	er risk factors			
Model Summary and ANOVA					
R-value			0.564		
R-Squared		0.319			
Adjusted R-Squared		0.312			
<u>F-value</u>		47.216			
P-value			0.000		

Note: Dependent Variable: Women's attitudes towards breast cancer risk factors

Predictors: (Constant), television, radio, newspaper, family/friends, internet and health workers.

The findings of the second hypothesis, which examined the impact of information sources on women's perceptions of breast cancer risk factors, are presented in Table 5a. According to the findings of the linear regression, the value of R-squared was 0.203, meaning that information sources may account for a variance of 20.3% in women's views regarding breast cancer risk factors.

Table 5b depicts the multiple regression results of hypothesis two, which fixated on the correlation between information sources (television, radio, newspaper, family/friends, internet and health workers) and women's attitude toward breast cancer risk factors. The path coefficient values were used to determine the direction and strength of the relationship between information sources and women's attitudes toward breast cancer risk factors. The r-square and p-value indicate the degree of variance in women's attitudes toward breast cancer risk factors as explained by information sources, respectively. Sequel to Table 4.6b, the finding shows that information sources significantly influence women's attitudes towards breast cancer risk factors at (R=564, R-squared =0.319 and p-value= 0.000<0.05). A strong correlation between information sources and women's opinions regarding breast cancer risk factors is indicated by the coefficient of 0.564. The R2 value of 0.319 implies that information sources can account for a 31.9 % variation in women's views regarding breast cancer risk factors.

Additionally, as the model's modified R-squared value of 0.312 indicates, the prediction of information sources on women's attitudes regarding breast cancer risk factors is thought to be responsible for 31.2% less variation than other explanations. This indicates that the information sources, i.e., television, radio, newspaper, family/friends, internet and health workers, jointly explain 31.2% of variations in the women's attitude towards breast cancer risk factors while the rest are explained by other variables not considered in the model. As a result, the model can be used to test the impact of information sources on women's attitudes towards breast cancer risk factors in a consistent way.

To determine if the model will considerably fit in forecasting the result using the mean, the study of variance was employed. The F-ratio measures how much better the forecast is as a consequence of fitting the model as contrasted to how inaccurate the model is.

Significant at (p<0.05) was the F-ratio of 47.216, which implies that information sources (television, radio, newspaper, family/friends, internet and health workers) are jointly significant in explaining variations in the attitude of women towards breast cancer risk factors. The model enhanced the ability to significantly predict the impact of information sources on the attitudes of women towards breast cancer risk factors.

The model also shows the estimate of  $\beta$  values and gives an individual contribution of each predictor (information sources) to the model. The  $\beta$  value describes the relationship between women's attitudes towards breast cancer risk factors with each predictor (television, radio, newspaper, family/friends, internet and health workers). The positive  $\beta$  values denote a favorable relationship between the predictor and the outcome. The regression model is depicted as follows:

 $y_1$ = women's attitude towards breast cancer risk factors  $x_1$ = television  $x_2$ = radio  $x_3$ = newspaper  $x_4$ = family/friends  $x_5$ = internet/websites  $x_6$ = health workers

The modified regression model is indicated below

$$y_1 = \beta_0 + \beta_4 x_4 + \beta_5 x_5 + \beta_6 x_6$$
  

$$y_1 = 1.8998 + 0.286 + 0.407 + 0.388$$
  
where:  

$$y_1 = \text{women's attitude toward breast cancer risk factors}$$
  

$$x_4 = \text{family/friends}$$
  

$$x_5 = \text{internet/websites}$$
  

$$x_6 = \text{health workers}$$

Note:  $x_1, x_2$  and  $x_3$  were not considered for the modified model because they do not contribute significantly to the model.

The model suggests that when all the predictors (television, radio, newspaper, family/friends, internet and health workers) are kept constant at zero, the women's attitude towards breast cancer risk factors will be at 1.998. A one-unit change in family/friends, internet and health workers will lead to 0.286, 0.407and 0.388 increases in the women's attitude towards breast cancer risk factors, respectively.

The t-test was done to assess if the predictors (television, radio, newspaper, family/friends, internet and health workers) made a big contribution to the model. In the event that the t-test associated with the -values is significant, the predictor makes a meaningful contribution to the model. The smaller the value of significant, the more significant the contribution of that predictor is (the larger the value of t). Television, Radio and Newspaper were statistically insignificant, according to the results. The results of the multiple regression analysis disclosed that family/friends (t=10.001, p<0.05), internet/websites (t=11.404, p<0.05) and health workers (t=310.033, p<0.05) are significant predictors of women's attitude towards breast cancer risk factors.

Specifically, out of the six information sources used in this study, it was discovered that the internet/websites have the most predictive value at the standardised coefficient (beta) value of 0.404, followed closely by health workers at the beta value of 0.355, which family/friends accounted for a beta value of 0.344.

# 4. Discussion of Findings

It is now flagrant evidence that breast cancer is one of the most often diagnosed malignancies among Lagos' female population. Individuals cannot gain adequate knowledge about something without having a credible source or form by which they gain such knowledge. Mukhwana [27] explains that various sources of information have been used to meet the requirements of specific groups of individuals in terms of health communication, based on psychographics and demographics.

Sources of information have been recognized as a crucial element of public health knowledge, particularly when it comes to understanding breast cancer risk factors [28]. The findings show that a large number of the respondents seek information on breast cancer risk factor messages from various information sources. This is most likely due to them having a symptom and wanting to know more about their chances/risk factors in having the disease, helping them cope with breast cancer for those that might have the disease, facilitating the decision-making process, achieving correct health-related information, feeling more confident, assuming health responsibility for self and their families, and hearing misconceptions they want to clarify. According to the study conducted by Alago and Awiti [17] women seek information on breast cancer to make informed decisions regarding preventive measures.

However, while some women actively seek knowledge, others deliberately avoid it. A study by Clarke, et al. [29] asserts that some women alternated between seeking and avoiding knowledge. Worry, dread, and sentiments of cynicism or negativity drove these women to shun knowledge. The results showed that more women seldom look for information about breast cancer risk factors from any information source. This finding can be attributed to the mindset of Lagos women that "what they do not know, can't kill them," thereby feigning ignorance about the disease. Additionally, limited coping resources, fear of regret upon discovering potential risk factors, and deep-seated beliefs, including spiritual convictions, contribute to the avoidance of information seeking [30].

Findings also revealed that the predominant source of knowledge about breast cancer risk factors was the internet/websites. The advancement of technology has increased the credibility of online sources, as they provide immediate access to information. Moreover, digital health communication has been instrumental in reducing barriers to accessing healthcare information [31]. Nevertheless, reliance on online information without guidance from healthcare professionals may lead to misinformation, emphasizing the need for credible and culturally relevant health communication.

Breast cancer communication efforts aim to describe breast cancer symptoms, educate individuals on risk factors, and remind them of preventive measures. The study's findings indicate that a significant number of participants had little understanding of breast cancer risk factors. Many believed that having relatives with breast cancer did not increase their risk, which contradicts studies such as those conducted by Couch, et al. [32]. Additional studies [33] confirm that having first-degree relatives with breast cancer significantly increases one's risk. Similarly, the majority of respondents did not associate early menstruation (<12 years) with an increased risk of breast cancer, contrary to findings by Eaton [34] and Mahdavi and Nasseri [35].

One of the critical gaps in breast cancer communication is the language barrier. Many health messages are disseminated in English, making them inaccessible to women who are more fluent in Indigenous languages such as Yoruba, Igbo, and Hausa. This study found that women who primarily communicate in Yoruba, which is widely spoken in Lagos,

often struggle to access breast cancer-related health information. Health communication campaigns must therefore incorporate Indigenous languages to enhance understanding and engagement. Studies have shown that messages delivered in a person's native language have a higher likelihood of acceptance and comprehension [36]. The use of Indigenous languages in health messaging can bridge the communication gap, reduce misinformation, and encourage preventive healthcare behaviors.

Findings revealed that Lagos women generally have a positive attitude toward breast cancer risk factors. A high number of participants believed that seeing a doctor was the best course of action for breast cancer care, indicating positive medical help-seeking behavior. However, knowledge does not always translate into behavioral change, as observed in this study. Previous research [37] has demonstrated that a lack of information often correlates with negative attitudes and behaviors. The observed positive attitudes may be attributed to breast cancer awareness initiatives encouraging women to adopt preventive measures. Nonetheless, long-term changes require continued education and culturally sensitive communication approaches that integrate Indigenous languages.

Conversely, studies Montiel-Lopez, et al. [14] and Dasgupta [38] indicate that some women exhibit negative attitudes toward breast cancer knowledge and treatment. These attitudes stem from fear of the unknown, anxiety, and, in some cases, spiritual beliefs. Some women believe that divine intervention supersedes medical care, leading them to reject medical diagnoses and treatment. These findings highlight the need for culturally appropriate interventions that respect spiritual beliefs while emphasizing the importance of medical care.

The key to prevention is understanding the risk factors. Breast cancer remains a leading cause of illness and mortality among women globally. Despite the increasing incidence of breast cancer, few women practice breast self-examination (BSE) or possess fundamental knowledge about risk factors. This study tested the hypothesis that information sources significantly influence women's understanding of breast cancer risk factors. Structural equation modeling, coefficient tables, and standard regression weights revealed that television, family and friends, the internet, and health professionals significantly impacted women's knowledge. This result underscores the necessity of leveraging multiple sources, including Indigenous language-based communication channels, to disseminate breast cancer information effectively.

The study further examined the influence of information sources on women's attitudes toward breast cancer risk factors. Findings revealed that family and friends, the internet, and health professionals had a substantial impact on women's perceptions. Family and friends play a crucial role as they provide emotional and material support, making them a trusted source of information. Similarly, the internet has enhanced women's knowledge and engagement in health decision-making. Independent online inquiries supplement clinical interactions and empower individuals in their healthcare journey [39]. However, skepticism remains regarding the credibility of online medical information, necessitating a multi-channel approach to breast cancer education.

Incorporating Indigenous languages into breast cancer communication is essential to improving health literacy and promoting early detection behaviors among Lagos women. Local media outlets, community health workers, and culturally adapted health campaigns should deliver messages in Yoruba and other Indigenous languages. Health information should be conveyed using relatable narratives and culturally familiar symbols to enhance engagement. Future research should explore the effectiveness of Indigenous language interventions in improving breast cancer awareness and prevention efforts.

Therefore, while the internet and health professionals remain primary sources of breast cancer information, the inclusion of Indigenous languages in health communication can significantly enhance knowledge dissemination and behavioral change. Culturally relevant strategies must be prioritized to ensure that all women, regardless of their linguistic background, have access to life-saving breast cancer information.

# 5. Conclusion

Information sources are important elements used to communicate health information on both communicable and noncommunicable diseases. However, the audience's capacity to comprehend, believe, and take action depending on the information received determines how successful various information sources will be. The study investigated the information sources women in Lagos state employed in assessing messages on breast cancer risk factors. It also assessed the knowledge of women towards breast cancer risk factors in Lagos state, as well as investigated the attitudes of women towards breast cancer's risk factors in Lagos state and determined the preferred information sources of breast cancer risk factors among women in Lagos state. One critical finding of this study is the role of language in health communication. Many women in Lagos state primarily speak Indigenous languages such as Yoruba, and the effectiveness of breast cancer awareness campaigns can be significantly improved by incorporating these languages into health messages. Health communication strategies should utilize Indigenous languages alongside English to ensure accessibility, comprehension, and engagement. By integrating culturally relevant communication methods, such as radio programs, community discussions, and translated digital content, health professionals can bridge the gap in breast cancer knowledge and encourage preventive healthcare behaviors. The inclusion of Indigenous languages will not only enhance understanding but also foster trust in health information sources, ultimately leading to better health outcomes for women in Lagos state.

## References

[1] World Health Organization, *World health statistics 2020: Monitoring health for the SDGs, sustainable development goals.* Geneva, Switzerland: World Health Organization, 2020.

- [2] X. Qian, H. Jia, Y. Zhang, B. Ma, G. Qin, and Z. Wu, "Risk factors and prediction of second primary cancer in primary female non-metastatic breast cancer survivors," *Aging (Albany NY)*, vol. 12, no. 19, p. 19628, 2020. https://doi.org/10.18632/aging.103939
- [3] United Nations, *The sustainable development goals report 2021*. New York: United Nations, 2021.
- [4] O. B. Azubuike, "Understanding the role of digital technologies in education: A review of recent evidence," *Education and Information Technologies*, vol. 23, no. 3, pp. 1019–1041, 2018. https://doi.org/10.1007/s10639-017-9642-5
- [5] C. A. Adebamowo *et al.*, "Waist-hip ratio and breast cancer risk in urbanized Nigerian women," *Breast Cancer Research*, vol. 5, no. 2, pp. 1-7, 2003. https://doi.org/10.1186/bcr567
- [6] E. Washbrook, "Risk factors and epidemiology of breast cancer," *Women's Health Medicine*, vol. 3, no. 1, pp. 8-14, 2006.
- [7] S. H. Njor, E. Paci, and M. Rebolj, "As you like it: How the same data can support manifold views of overdiagnosis in breast cancer screening," *International Journal of Cancer*, vol. 143, no. 6, pp. 1287-1294, 2018.
- [8] Y.-S. Sun *et al.*, "Risk factors and preventions of breast cancer," *International journal of biological sciences*, vol. 13, no. 11, pp. 1387-1397, 2017.
- [9] H. M. Asif, S. Sultana, N. Akhtar, J. U. Rehman, and R. U. Rehman, "Prevalence, risk factors and disease knowledge of breast cancer in Pakistan," *Asian Pacific journal of Cancer Prevention*, vol. 15, no. 11, pp. 4411-4416, 2014. https://doi.org/10.7314/apjcp.2014.15.11.4411
- [10] M. P. Banegas, Y. Bird, J. Moraros, S. King, S. Prapsiri, and B. Thompson, "Breast cancer knowledge, attitudes, and early detection practices in United States-Mexico border Latinas," *Journal of Women's Health*, vol. 21, no. 1, pp. 101-107, 2012.
- [11] S. Macdonald *et al.*, "Mass media and risk factors for cancer: The under-representation of age," *BMC Public Health*, vol. 18, no. 1, pp. 1-11, 2018.
- [12] D. U. Ramathuba, C. T. Ratshirumbi, and T. M. Mashamba, "Knowledge, attitudes and practices toward breast cancer screening in a rural South African community," *Curationis*, vol. 38, no. 1, pp. 1-8, 2015. https://doi.org/10.4102/curationis.v38i1.1172
- [13] N. A. Ibrahim and O. O. Odusanya, "Knowledge of risk factors, beliefs and practices of female healthcare professionals towards breast cancer in a tertiary institution in Lagos, Nigeria," *BMC Cancer*, vol. 9, no. 1, pp. 1-8, 2009.
- [14] F. Montiel-Lopez *et al.*, "Prevalence, attitude, knowledge, and risk perception towards COVID-19 in COPD patients associated to biomass exposure," *International Journal of Environmental Health Research*, vol. 33, no. 2, pp. 170-179, 2023. https://doi.org/10.1080/09603123.2021.2013449
- [15] L. Simione and C. Gnagnarella, "Differences between health workers and general population in risk perception, behaviors, and psychological distress related to COVID-19 spread in Italy," *Frontiers in Psychology*, vol. 11, p. 2166, 2020.
- [16] C. Kratzke, A. Amatya, and H. Vilchis, "Breast cancer prevention knowledge, beliefs, and information sources between non-Hispanic and Hispanic college women for risk reduction focus," *Journal of Community Health*, vol. 40, pp. 124-130, 2015. https://doi.org/10.1007/s10900-014-9908-9
- [17] S. Alago and J. Awiti, "Preferred breast cancer message sources and frames amongst western Kenyan women," *Journal of Development and Communication Studies*, vol. 4, no. 2, pp. 454-468, 2016.
- [18] S. W. Smith *et al.*, "Topics and sources of memorable breast cancer messages and their impact on prevention and detection behaviors," *Journal of Health Communication*, vol. 14, no. 3, pp. 293-307, 2009.
- [19] B. Blumberg, D. Cooper, and P. Schindler, "Survey research," Business Research Methods, 2005.
- [20] B. Elewonibi and R. BeLue, "The influence of socio-cultural factors on breast cancer screening behaviors in Lagos, Nigeria," *Ethnicity & Health*, vol. 24, no. 5, pp. 544-559, 2019. https://doi.org/10.1080/13557858.2017.1348489
- [21] H. Ø. Haugen, "Nigerians in China: A second state of immobility," *International Migration*, vol. 50, no. 2, pp. 65-80, 2012.
- [22] N. Okorie, "Mass media strategies for creating awareness of breast cancer," *Public Knowledge Journal*, vol. 2, no. 1, pp. 1-18, 2013.
- [23] National Population Commission (NPC), *Population and housing census of the federal republic of Nigeria: National and state population and housing tables: Priority tables.* Abuja, Nigeria: National Population Commission, 2006.
- [24] A. Fapohunda *et al.*, "Cancer presentation patterns in Lagos, Nigeria: Experience from a private cancer center," *Journal of Public Health in Africa*, vol. 11, no. 2, p. 1138, 2020.
- [25] J. Keyton and S. J. Beck, "Team attributes, processes, and values: a pedagogical framework," *Business Communication Quarterly*, vol. 71, no. 4, pp. 488-504, 2008.
- [26] O. M. Mugenda and A. G. Mugenda, *Research methods: Quantitative and qualitative approaches*. Nairobi, Kenya: Acts Press, 1999.
- [27] C. Mukhwana, *Characteristics of authentic entrepreneurial leadership within information technology startups in Kenya*. Kenya: Walden University, 2021.
- [28] E. Adesina, O. Oyero, N. Okorie, L. Amodu, B. Adeyeye, and D. Yartey, "Data on information sources, knowledge and practice on hepatitis B virus in Southwest Nigeria," *Data in brief*, vol. 30, p. 105507, 2020. https://doi.org/10.1016/j.dib.2020.105507
- [29] C. N. Clarke, C. S. Cortina, O. M. Fayanju, L. A. Dossett, F. M. Johnston, and S. L. Wong, "Breast cancer risk and screening in transgender persons: A call for inclusive care," *Annals of Surgical Oncology*, vol. 29, no. 4, pp. 2176-2180, 2022.
- [30] D. Melnyk and J. A. Shepperd, "Avoiding risk information about breast cancer," *Annals of Behavioral Medicine*, vol. 44, no. 2, pp. 216-224, 2012.
- [31] K. Vance, W. Howe, and R. P. Dellavalle, "Social internet sites as a source of public health information," *Dermatologic Clinics*, vol. 27, no. 2, pp. 133-136, 2009.
- [32] F. J. Couch *et al.*, "Inherited mutations in 17 breast cancer susceptibility genes among a large triple-negative breast cancer cohort unselected for family history of breast cancer," *Journal of Clinical Oncology*, vol. 33, no. 4, pp. 304-311, 2015.
- [33] Ö. Karayurt, D. Özmen, and A. Ç. Çetinkaya, "Awareness of breast cancer risk factors and practice of breast self examination among high school students in Turkey," *BMC Public Health*, vol. 8, no. 1, pp. 1-8, 2008.
- [34] L. Eaton, "Early periods and late childbearing increase risk of breast cancer, study confirms," *BMJ*, vol. 324, no. 7334, p. 386, 2002.
- [35] F. Mahdavi and A. R. Nasseri, "Breast cancer, a systematic review of epidemiology, diagnosis, surgical treatments, radiotherapy and chemotherapy," *International Journal of New Chemistry*, vol. 9, no. 3, pp. 472-479, 2022.

- [36] L. Ferguson, D. Lezotte, B. Haglund, and S. Ishida, *Introduction to public health*. Burlington, MA: Jones & Bartlett Learning, 2019.
- [37] S. Solikhah, S. Promthet, and C. Hurst, "Awareness level about breast cancer risk factors, barriers, attitude and breast cancer screening among Indonesian women," *Asian Pacific Journal of Cancer Prevention*, vol. 20, no. 3, p. 877, 2019. https://doi.org/10.31557/APJCP.2019.20.3.877
- [38] N. Dasgupta, "Implicit attitudes and beliefs adapt to situations: A decade of research on the malleability of implicit prejudice, stereotypes, and the self-concept," *Advances in Experimental Social Psychology*, vol. 47, pp. 233-279, 2013.
- [39] E. Fahy, R. Hardikar, A. Fox, and S. Mackay, "Quality of patient health information on the Internet: reviewing a complex and evolving landscape," *The Australasian Medical Journal*, vol. 7, no. 1, pp. 1-24, 2014.