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### Original Article

# Knowledge and practices of breast self-examination amongst women attending a surgical outpatient clinic, Cameroon

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### Abstract

**Background:** The study sought to test the knowledge and practices of breast self-examination (BSE) amongst women attending a surgical outpatient clinic in a northwestern region of Cameroon. Based on the information, we aimed to undertake an education intervention program focused on dealing with any knowledge and practice gaps discovered.

**Methods:** A cross-sectional descriptive research design was used. A computer-based random sampling technique was adopted to select 200 female patients attending a surgical outpatient clinic in Shisong, the northwestern region of Cameroon. We obtained our data using pre-tested proforma which composed of four sections: I) Socio-demographic characteristics, II) knowledge about BSE and breast cancer, III) practices of BSE and IV) factors affecting BSE. Data obtained was analyzed using the Statistical Package for the Social Sciences (SPSS) version 22 and presented with inferential descriptive statistics.

**Results:** Results showed that women attending a surgical outpatient clinic showed good knowledge of early warning signs and symptoms about breast cancer as well as BSE. About 36% of the women were confident of the timing to start BSE and 78% were conversant with how BSE is done, but were not competent in their practice. The multivariate analysis showed that the single most significant factor affecting the practice of BSE was forgetfulness, odd-ratio (95% CI)=1.55 (1.32–1.82); p=0.001.

**Conclusions:** The female patients attending a surgical outpatient clinic in Shisong were conversant with BSE and they practiced it. Knowledge and practice of BSE may be improved significantly by encouraging an aggressive primary health awareness campaigns nationwide, training the health care providers and setting-up sustained educational framework as well as policy guidelines on BSE skills.

**Keywords:** breast cancer, breast self-examination, Cameroon, knowledge

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## Introduction

Breast cancer is the most frequently encountered malignancy among women worldwide and the rate of occurrence is on the rise [1,2]. Worldwide, it is estimated that we had 2.1 million new cases of breast cancer, 630,000 deaths and in the category of women living with breast cancer, there were 18.3 million in the year 2018 [1-3]. The low-resource countries in sub-Saharan Africa are not also spared; with records of a significant rise in the frequency of breast carcinoma [4-6]. Interestingly, we are witnessing a rapid rise in the frequency of occurrence of breast cancer especially in communities that used to experience a low incidence of the disease [7-9]. Studies performed in Cameroon [2,4,10] and Ghana [2,4,10,11] showed that the most commonly diagnosed malignancy amongst women is breast cancer. Other authors suggested that there is really a growing epidemic of the disease amongst women because of the huge estimated figure of 211,000 new cases of invasive breast cancer that were diagnosed in 2007 and about 43,300 death because of this disease [7-10,12]. The burden of the disease is equally very high in Central Africa, where the incidence of breast cancer was reported to be 27.9 per 100,000 in 2018 [13].

Breast cancer is being presented in the literature as becoming a rising urgent public health problem especially in low-resource settings where the incidence rates have risen to about 5% each year [14]. Some studies have compared the disease in Africa with western countries, which suggested that "breast cancer in African women occurs in premenopausal women with incidence peaking between the ages of 35 and 45 years" [15-17]. Breast cancer in African women is associated with an aggressive triple negative subtype which is non-responsive to common chemotherapy which is very similar to African-American women in the USA [18,19]. "There seems to be a lot of epidemiological variation in the occurrence of breast cancer in the developed and developing countries" [7]. "These variations also include the fact that the mortality rates for African women diagnosed with breast cancer are relatively higher when compared to women in Western countries; it is equally estimated that over 50% of these cases will die from the disease or its consequences" [3,15,20,21].

From the foregoing, one primary challenge to breast cancer care is the constraint in medical care and screening practices in Africa [15,22]. Because of this limitation, other authors submitted that unless something is done to dramatically improved the situation especially screening practices in Africa, then breast cancer mortality rates are most likely to remain disproportionately high [15,22]. "Apart from African women being predisposed to the more aggressive form of breast cancer, the disproportionately greater mortality rate compared to high-resource countries can be attributed to a lack of public awareness of the disease, absence of organized screening programs, delayed presentation and lack of accessible and effective treatment options" [15,23]. "In view of the above, the majority of the patients are diagnosed only after the breast cancer has long begun, that is the disease is already at an advanced stage and has metastasized to other organs" [17]. For instance, about 70-90% of African women present with stage III or IV breast cancer, presenting much longer before the diagnosis is made [24, 25]. "The advanced stage distribution is partially explained by a delayed presentation for medical evaluation, which, according to Anyanwu et al [7,26], can be as high as 11 years from the time of self-detected breast abnormality. While in western countries, breast cancer screening is usually done using mammograms, the use of mammograms is limited and inaccessible to most women in sub-Saharan Africa. As a result of the foregoing, we are unlikely to see any significant changes in the incidence of breast cancer in Africa in the foreseeable future" [15, 27].

According to Anderson et al, breast self-examination (BSE) can be defined as "a procedure by a woman by examining her breasts and their accessory structures for evidence of changes that could show a malignant process" [28]. The public awareness of BSE remains an enigma, an important breast cancer prevention strategy. Any act of furthering the public awareness of BSE is summarily critical and therefore required to be supported as a part of general self-care requirements; mainly because the majority of breast tumors (about 90%) are initially discovered by women themselves [29]. Significant numbers of breast carcinomas are hand-felt as lumps and may be discovered early as at a size of about 1 cm. The implication of early detection strategies is that of a reduction in the high rate of death associated with breast cancer especially by early detection from mammography and physical examination (breast self-examination) [15,30]. Unfortunately, we are witnessing a situation whereby most female physicians and nurses (65% and 70% respectively) do not hold strong this belief that BSE is necessary, therefore, there is a need to truly assess BSE as well as cancer awareness; knowledge and practice among the nursing students who will be part of the future health personnel [15,31].

"Awareness and understanding of breast cancer in Africa are low. In recent years, the World Health Organization (WHO) and several international organizations such as the Breast Health Global Initiative (BHGI) have sought to increase breast cancer awareness among African women" [14,15, 32]. Other similar studies globally have established that breast cancer awareness rises proportionately with the level of education [15,33]. There has been no study in Shisong hospital setting on the knowledge and awareness of breast cancer and self-examination amongst women.

## Objectives of the study

The primary objective was to assess the knowledge of BSE amongst women attending a surgical outpatient clinic in Cameroon. The secondary objective was to find out the practice of the women towards BSE.

Study inquiry: 1) What is the knowledge of the women about BSE? 2) Do the women practice BSE?

Hypothetical proposition: There are no significant differences between factors affecting BSE practice amongst women attending a surgical outpatient clinic in Cameroon.

## Methods

### Study design and settings

A single-stage cross-sectional descriptive study was conducted in a surgical outpatient clinic at a mission hospital, Cameroon over a three months period from September to December 2018. The hospital is a 250-bedded mission hospital in Shisong-Kumbo, a rural community in the northwestern region of Cameroon which is about 100 kilometers from the regional headquarter city of Bamenda. GPS satellite coordinate location of Shisong-Kumbo shows longitude 6°12'18.00" North and latitude 10°41'6.00" East. The hospital serves principally as a referral center to about three million people in the sub-region. The target population was 500 female patients attending the outpatient clinic over the three-month study period. The study model used in this study was like that of Adeyemo et al used for a similar study but with some modifications [7].

### Study population and procedure

The study population comprises 200 female patients recruited for this study using a computer-based random sampling technique. The initial sample size estimation of 205 female patients was determined using the Kish Leslie formula. The study population estimation was equally based on a 10% nonresponse rate; with five cases discounted because of a lack of data. A pre-tested proforma was developed by the researchers. The proforma was divided into four sections: sections A (socio-demographic data), B (questions on knowledge of BSE and breast cancer), C (questions on the practice of BSE) and D (questions on factors affecting BSE).

Sample size calculation: "Kish Leslie formula:  $n = z^2pq/e^2$ , where  $p =$  proportion of BSE among female patients (14%), [34,35]  $e =$  desired level of precision (5%),  $z =$  95% CI (1.96) and  $q =$  study population."

Validity of the instrument: The questionnaires were validated by the experts in that area.

Reliability: The test re-test method was used for the reliability of the instrument. The result was 0.8.

### Data collection

The pre-tested proforma became the instrument for the collection of the relevant study data especially those women who consented to take part in the study within a designated area of the surgical outpatient clinic. The participants were informed about the set time limit required for completion of the proforma to be approximately 15 minutes. The proforma was made anonymous as part of a strategy to maintain confidentiality based on the Helsinki Declaration of 1964. Prior to the survey, we adopted a modified version of the Breast Cancer Perceptions and Knowledge Survey previously used by other authors on similar studies and from our own experience [7,36–38]. The proforma was translated into the local language where applicable and reconsidered for the common language usage. We then carried out a pilot testing on 30 nursing students that were randomly selected on the hospital wards to remove ambiguity in the wordings. Results of the pilot test were used to adjust the proforma wording to make it maximally easy to understand before the proforma was thereafter dispensed to women in this study.

The proforma was administered by the research assistant at the surgical clinic to the participants after informed consent had been obtained and in certain few instances, administered with an interpreter. We adapted items in the proforma for this study by including the following responses; "I don't know" and "agree" (yes), "disagree" (no) format used by previous authors. For the knowledge of breast cancer section; so that one can fully assess knowledge of a particular risk factor, the women were asked whether any factor would, "increase", "decrease", "had no effect" on the risk for breast cancer or show if they "don't know". The proforma used in this study had 25 questions, of which 13 assessed knowledge about breast cancer risk factors, 12 assessed perceptions of breast cancer and general knowledge about BSE. Each correct answer based on the American Cancer Society [39], was assigned a score of 1, while an incorrect answer or 'don't know' was awarded a score of 0. A total score for each participant was computed by summing the number of correct answers. A correct answer was assigned one point, whereas a wrong or missed answer was given a zero. Knowledge score was changed into the percentage score" [39]. Based on the responses of the women; we divided the studied women into two categories; insufficient level (<50% of all corrected-answers) and sufficient level (≥50% of correct answers). The socio-demographic data of the women were also gained to cover information such as gender, age, school attended, marital status, occupation and knowledge of someone with breast cancer. "Based on previous studies [40], we hypothesized that these factors might influence breast cancer knowledge among the participants" [40]. 205 women

ultimately completed the proforma from the 500 available women. From our final analysis, the non-included were comparable to the included in terms of patient characteristics and socio-demographics. There was no statistically significant risk of selection bias. Additional information where applicable were got from the patients' medical file.

### Statistical analysis

The patients' detailed data were computed into an excel database (Excel 2007, Microsoft corporation®) and analyzed using the Statistical Package for the Social Sciences (SPSS) version 22 (IBM Corp, Armonk, NY, USA). Inferential descriptive statistics was used in presenting the data in the form of frequency table, percentages and bar charts, etc.

### Hypothetical proposition

There was no statistically significant difference between factors affecting BSE, this hypothesis was tested using multivariate analysis and binominal characteristic established with Chi-square at a p-value of 0.05, the result is presented in Table 12. We assessed any associated factors affecting the practice of BSE in a multivariate model using logistic regression.

### Ethical consideration

We got an informed consent from each female patient attending a surgical outpatient clinic in Cameroon for the study. The significance of embarking on such a study was explained to the participants before administering the proforma. Confidentiality was ensured by not writing the names of patients on the proforma in accordance with the Helsinki Declaration of 1964. Ethical approval was obtained from the Caritas Foundation Healthcare Ethical Review Committee. Approval No: DTAD/12/488/142/2019.

Reporting: The reporting of this study was based on the STROBE/STROCCS guidelines [41, 42].

## Results

### Socio-demographic characteristics of the study population

The mean (SD) age of the study population was 29 (12.1) years; with an age range between 18 years and 52 years. The Christians were (Number (n) =180; 90%) and the majority with a high school education level. We observed that one-third (35%) of the studied women belong to the upper-middle socioeconomic class. The single parity respondents were (n=100; 50%); nulliparous (n=40; 20%) and multiparous (n=60; 30%). One hundred and seventy women (85%) had no personal or family history of breast cancer as showed in Table 1. Table 2 shows the distribution of women with a positive family history of breast cancer, the first-degree relatives represented 33.3% of the 15 confirmed breast cancer cases.

**Table 1.** Socio-demographic characteristics of the study population

Features	Frequency (n=200)	Percentage
<b>Age group (years)</b>		
<20	08	04
21-30	66	33
31-40	64	32
41-50	42	21
51<	20	10
Total	200	100
<b>Level of education</b>		
Primary	14	07
Secondary	106	53
Tertiary	80	40
Total	200	100
<b>Marital status</b>		
Single	60	30
Married	80	40

Divorced	32	16
Widowed	28	14
Total	200	100
<b>Occupation</b>		
Farming	46	23
Self-employed	50	25
Housewife	36	18
Professionals	64	32
Others	24	12
Total	200	100
<b>Religion</b>		
Christianity	180	90
Muslim	16	08
Others	04	02
Total	200	100
<b>Parity</b>		
Nulliparous	40	20
Single parity	100	50
Multiparous	60	30
Total	200	100
<b>Family history of breast cancer</b>		
Yes	30	15
No	170	85
Total	200	100
<b>Reasons for clinic visits</b>		
Post-operative follow-up visits	11	5.5
Abdominal pain	21	10.5
Breast lumps/pains	18	9.0
Lipoma	19	9.5
Hernias	20	10.0
Goiters	12	6.0
Gastritis/peptic ulcer disease	23	11.5
Joint pains/swellings	16	8.0
Minor traumas	14	7.0
Pregnancy-related symptoms	26	13.0
Pelvic diseases	20	10.0
Total	200	100

**Table 2.** Respondents with family members diagnosed with breast cancer

Respondents	Frequency (n=15)	Percentage
Aunt	4	26.7
Mother	2	13.3
Sister	3	20.0
Others	6	40.0
Total	15	100

### Study inquiry one

What is the knowledge of women attending a surgical outpatient clinic in Cameroon towards SBE?

We used the frequency and percentages to answer this study inquiry one and presented the findings in Table 3 and Table 4. As shown in Table 3, most of the respondents (n=180; 90%) are knowledgeable about SBE and breast cancer. This supporting reason for the submission could be explained by the disposition of the women as mainly urban educated women, the few numbers in the sample that are not knowledgeable are the rural dwellers. As presented in Table 4, 32% of the participants submitted that they examined their breast at least once in the month preceding the study, 30% about 2-6 months before, 15% only if there was pain and 17% at convenience.

Knowledge of early warning signs of breast cancer: Breast lump that is fixed not tender is an early sign of breast in 85% respondents claimed while 64% believed that enlarged lymph nodes were the early signs of breast cancer [Table 4]. The women's knowledge of breast cancer early warning signs and symptoms revealed that they had a mean score of 65% correct responses in most of the questions set in Table 5.

**Table 3.** Frequency of knowledge of respondents towards BSE

Knowledgeable of BSE	180	90
Not knowledgeable	20	10
Total	200	100

**Table 4.** Showing when last the respondents examine their breast

When last did you examine your breast?	Frequency (n=200)	Percentage
Less than one month	64	32
Two to six months ago	60	30
When I feel pain	30	15
At convenience	34	17
Others	12	06
Total	200	100

**Table 5.** Summary of breast cancer early warning signs and symptoms with correct responses

Knowledge of breast cancer early warning signs and symptoms	Correct answers (percentage)
Breast lump that is fixed not tender	85
Skin or nipple retraction	55
Nipple discharge in a non-lactating woman	65
Enlarged lymph nodes in axillae	64
Small pimple on the breast	51

### Study inquiry two

Do Cameroonian women attending a surgical outpatient clinic practice SBE correctly?

As displayed in Table 6, the respondents' knowledge of the definition of BSE was accurate in 182 women. The knowledge of what is inspected during BSE practice amongst the respondents was equally correct in 156 women as outlined in Table 7.

Practice of BSE: The majority believed that the most appropriate time to performing BSE is best after menstruation in (128; 64%) women and that the frequency for performing BSE was biannual (100; 50%) as shown in Table 8. One hundred fifty-six (78%) women knew the proper way to perform BSE and 44 (22%) women did not know how to perform BSE due to certain barriers [Table 9].

Source of influence to do BSE: From Table 10, the mass media had the most significant influence on the respondents (n=156; 78%), which was closely followed by age (n=30; 15%) cases.

**Table 6.** Respondents' knowledge of the definition of BSE

Variable	Frequency (n=200)	Percentage
The assessment made on the breast by an individual to check for breast lumps	182	91
The assessment made on the breast by a doctor or nurse to check for breast lump	08	4
The use of X-ray to assess for breast cancer	10	5
Total	200	100

**Table 7.** Respondents' knowledge of what is inspected during BSE

Variable	Frequency (n=200)	Percentage
<b>Fluid coming from the nipple in a non-lactating mother</b>		
Yes	154	77
No	24	12
No idea	22	11
Total	200	100
<b>Shape and size of the breast</b>		
Yes	160	80
No	22	11
No idea	18	09
Total	200	100
<b>Skin for changes in the contour, any swelling and nipple appearance</b>		
Yes	176	88
No	04	02
No idea	20	10
Total	200	100

**Table 8.** Respondents' knowledge of the initiation of BSE

Variable	Frequency (n=200)	Percentage
As soon as she starts menstruating	128	64
At the age of 20 years in order to familiarize with her breast	56	28
At the age of 40 years	14	7
When she has been diagnosed with breast cancer	2	1
Total	200	100

**Table 9.** Respondents' performance of BSE

Variable	Frequency (n=200)	Percentage
Yes	156	78
No	44	22
Total	200	100

**Table 10.** Respondents' source of influence to do BSE

Variable	Frequency (n=200)	Percentage
Age	30	15
Family history of breast cancer	10	05
Previous diagnosis of breast cancer	04	02
Mass media	156	78
Total	200	100

Source of information: The mass media which consists essentially of television and radio were found to be the most common sources of information about breast cancer (n=152; 76%) followed by the role of family physicians which was mentioned by (n=28; 14%) respondents [Table 11].

**Table 11.** Respondents' sources of information on BSE

Variable	Frequency (n= 200)	Percentage
Mass media	152	76
Friends	06	04
Family	12	06
Health care personnel	28	14
Total	200	100

### Factors affecting BSE practice

As presented in Table 12, the multivariate analysis displayed that the single most significant factor for performing BSE was forgetfulness odd-ratio (95% CI)=1.55 (1.32–1.82); p=0.001. The other factors being afraid, bad feeling and feeling irritated may invariably impact on BSE but did not reach statistical significance. From the foregoing, there is a statistically significant difference between factors affecting BSE, therefore, the null hypothesis is rejected while the alternate hypothesis is retained.

**Table 12.** Multivariate analysis for factors affecting BSE practice amongst the respondents

Respondent	Frequency	Odd ratio	(95% CI)	p-value
Forgetfulness	92	1.55	(1.32–1.82)	0.001
Afraid	78	1.21	(0.14–11.03)	0.062
Feel bad	26	1.82	(0.52–1.99)	0.085
Feel irritating	4	1.36	(0.98–2.88)	0.072
Total	200			

## Discussion

### Knowledge of breast self-examination and breast cancer

The majority of the participants in this study showed adequate knowledge of BSE. "This is in agreement with Janice and Kerry [7,9,43] who estimated that 85-90% of women perform BSE monthly, but in contrast to the results of Doshi et al who noted that the practice of BSE among Indian women was alarmingly low" [7,44]. "Different studies show diverse results ranging from poor to good knowledge about BSE and breast cancer. For instance, the literature reported that among the Nigerian women, knowledge about symptoms, methods of diagnosis and BSE were very good" [7,45].

Several similar types of studies have been reported in varying cohorts like teachers [46], healthy women [47], general female population [48-54], immigrants [55-57], different ethnic population [58,59] and secondary school students [60], etc. To summarize the results, we notice the following characteristics: 1) females are relatively knowledgeable regarding breast cancer [61] and 2) young educated urban women are seem to be more knowledgeable about breast cancer signs and symptoms as well as risk factors than their older counterparts



[62]. The explanation may be that older women may be afflicted with several diseases at the same time so; it would be difficult for them to correlate with the etiology of the symptoms. The findings of our study, contrast to that found by Azemfac et al [63] in Cameroon whereby "Women showed low frequency of knowledge of BSE, as 25% (n=201) of household representatives reported any knowledge of BSE and among these only 15% (n=30) practiced BSE on a monthly basis" [63]. The probable reasons for the sharp contrast to Azemfac et al findings include: 1) the difference in the patients' socio-demographic characteristics, especially a contemporary poor native community women who often may not be able to afford the hospital services as compare to our study in which about one-third (35%) of the population belonged to the upper-middle socioeconomic class and 2) presumed error because of bias, because during the data collection the participants might even inadvertently exhibit some bias in reporting information about themselves that they perceived as intimate; As a way of eliminating presumed error from selection bias, a prospective community-based study will be carried out in the shortest possible time. In concordance with the findings of this study, physicians or health professionals can help significantly in disseminating information and educating people regarding breast cancer risk factors, a warning sign, symptoms and screening methods [58]. Other authors show that women learn from their physicians rather than friends and relatives [50,64]. The reason behind this may probably be that the first most important point of call by an individual in contact with health professionals for different diseases other than breast problems [50,64].

### Risk factors for breast cancer

In this study, when there is a previous family history or a previous breast problem such women easily appreciate better their perceived risk level than women without these risk factors. A family history of breast cancer and a previous history of a breast problem also positively influence breast cancer knowledge level [48,65]. Age [48,64,66,67], education level [47-49], household income [64,65], marital status [61,67] significantly increase the breast cancer risk knowledge level. Socio-economic status, knowledge level and age are all related to risk perception [64]. It is our opinion that adequate knowledge of BSE is an important issue for the early detection of breast cancer and the improvement of health-seeking behavior.

This study equally indicated the knowledge level of the Cameroonian women cohort on BSE and breast cancer but nonetheless, this was a selected population of women seen in a hospital clinic. It will definitely have an overall impact on our policymakers to think twice regarding the improvement of the situation from breast cancer mortality.

### Practice of breast self-examination

Most of the women in our series believed that the most appropriate time to performing BSE is best after menstruation and that the frequency for performing BSE was biannual as shown in Table 8. The finding shows that most women know the proper way to perform BSE and although BSE was practiced, it was not properly done. This brings to mind the role of health-care educators or personnel in educating the women and populace on the rudiments of BSE which will impact positively on the population at large in the long run [7,9,47-49]. This was in agreement with the findings of Bassey et al [7,9] who established a strong link with women who had carried out BSE, they probably did so to examine their breasts because of a background family history of breast cancer [7,9]. According to Doshi et al, the practice of BSE amongst a group of Indian dental students was alarmingly low [7,44]. Likewise, Nguetack CT et al submitted that the level of knowledge and practice was respectively weak (50.1%) and poor (36.4%) among female healthcare providers in a large Cameroonian city [68].

Our study revealed that forgetfulness was the single most important factor affecting the practice of BSE amongst the women attending the surgical outpatient clinic in Shisong, apart from the fact that most of the respondents did not submit to have any negative impressions about BSE. This is also in concordance to Budden's finding, which was better explained that female students freely talk about BSE and as a result, others should be encouraged to freely talk on BSE [69]. "Breast self-examination is a simple and cost-effective method for the early detection of breast cancer. But there is some controversy over the effectiveness of BSE. Kotka's pilot project found that BSE has improved early detection and reduced mortality [36]. In contrast, St. Petersburg [70] and Shanghai [71] studies revealed no improvement in stage shifting or mortality reduction [7]. However, BSE has a great role in awareness programs for breast cancer and may also help as the initial breast screening modality especially in countries with limited resources" [7].

Some experts report at the global level on early breast cancer detection. Breast cancer awareness may best be carried out by encouraging women to practice BSE. This approach is easily realizable especially for a country with limited resources like Cameroon [4,5]. "The breast cancer prevention schemes in most developing countries including Cameroon is under the responsibility of national breast cancer prevention programs promoted by the WHO" [4,5]. "The essential component of this scheme involves educating and screening young women for signs of breast cancer. The focus is early detection of breast cancer, which positively impact in the long run on the effectiveness of the treatment and the likelihood of survival" [4,5]. The general approaches to breast cancer screening include BSE, clinical breast examination and mammography, which are usually done in combination [72].

In Cameroon, "our cancer surveillance system is not well developed, therefore, there are resultant high deaths related to cancer which often are unreported" [4,63,68]. "In an attempt to control cancer including breast cancer; there is a need for periodic screening campaign programs which are not very effective since they are mainly organized in the major urban centers" [4,73]. The role of mass media in the dissemination of health campaign policy of the government and other agencies cannot be overemphasized in breast cancer prevention strategy [4,73]; which in this study was found to be the most common source of information about breast cancer. Far more important than the mass media and in agreement with other authors is the fact that the family physicians can play a significant guiding role to patients in breast cancer prevention strategies especially because they are the first contact with such patients for health-related issues [4-10]. "The most important benefit of BSE in this respect may be a resolve to delayed presentation for medical evaluation afflicting most African women diagnosed with breast cancer, which, according to Anyanwu et al, can be as high as 11 years from the time of self-detected breast abnormality" [15,26]. "To fight against the scourge of breast cancer, we need a constructive integrated national policy that will focus on mass awareness and improvement of women's health-seeking behavior" [63,68]. "There is a need for a national population-based study targeted toward healthy women that will indicate about the knowledge, attitude and practice regarding breast cancer among Cameroonian population [4,63,68]. These efforts in the long-run will also help to refocus our future health professionals and planners to think about how they will deal with this fast-growing problem of breast cancer in the future."

Finally, using the data in this series, we intend to design a Johnson's Health Belief Model Scale (JHBMS), that would be useful in the national or population-based interventions for any detected knowledge gap and also aimed at preventing breast cancer through increased awareness and or improved screening on a large scale.

### Limitations

1. As a cross-sectional study, the limitations of this study relate to the design itself in which the study is carried out at a single point in time and/or over a short period at most.
2. This allows for a snapshot of the outcomes and its related characteristics, which are believed, could be different provided another time frame had been chosen.
3. The other potential limitation is the fact that the interviewees probably could have exhibited some bias (even unknowingly) in reporting information about themselves that they perceived as intimate.

### Conclusion

Breast self-examination is a screening method used to detect early breast cancer. The method involves the woman herself looking at and feeling each breast for lumps, distortions or swelling. It is the quickest way to detect any abnormality in the breast. It's simple, easy and not expensive. The Cameroonian women attending a surgical outpatient clinic in Shisong were conversant with BSE and they practiced it. Knowledge and practice of BSE may be improved significantly by encouraging aggressive primary health awareness campaigns nationwide, training the health care providers and setting-up sustained educational framework and policy guidelines on BSE skills.

### Recommendations

1. Based on this study, we observed that BSE is a simple, easy and non-expensive procedure, therefore, there is a need for all women to be educated about the technique.
2. We also advocate that most school management should encourage the regular teaching of BSE to students, as part of the basic health training curriculum.
3. As a way of eliminating presumed error from selection bias, a prospective community-based study will be carried out in the shortest possible time.
4. The healthcare professionals in all Cameroonian primary care centers and hospitals should be encouraged to regularly educate their patients, as well as transmit the message on to the public thereafter.
5. We also advocate for a constructive integrated national policy for an aggressive campaign against the scourge of breast cancer. That will focus on mass awareness and improvement of women's health-seeking behavior.
6. There is a clarion call for a national population-based study that will indicate about the knowledge, attitude and practice regarding breast cancer among healthy Cameroonian women.
7. There is also a strong need for the training of all health care providers on BSE as a way of promoting the dissemination of BSE skills across the entire communities.
8. The female students in our higher institutions should be well educated on BSE as a long-term approach to promoting the awareness of BSE skills and techniques to our women at large.

## Conflict of interest

There are no conflicts of interest to declare for all of the authors.

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