

# Breast self examination by female students of the universite officielle de ruwenzori, butembo city, democratic republic of Congo

## Abstract

### Introduction

Breast self-examination is one of the most effective measures strongly recommended for the prevention of breast cancers by means of early detection.

### Material and method

An institution and self-administered questionnaire based cross-sectional survey was conducted among female students of the Université Officielle de Ruwenzori (UOR), Butembo city, in the Democratic Republic of Congo (DRC) during the academic period 2018 to 2019.

### Results

215 female students out of 358 were included (response rate: 60.00%). Age mean and median were 22.74 years (95%CI: 22.25-23.24) and 22.00 years respectively. Most of them belonged to Nande/Yira tribe (81.55%; 95%CI: 75.61%-86.31%), the Faculty of Medicine (56.34%; 95%CI: 49.55%-62.90%) and catholic religion (53.49%; 95%CI: 46.75%-60.11%). The absolute majority of them had a basic knowledge about breast self-examination (BSE) (79.44%; 95%CI: 73.45%-84.37%) while only a slight majority has performed BSE at least once (55.71%; 95%CI: 48.88%-62.34%). Only the course of study (Medicine), residence (Butembo city), having basic knowledge about breast cancers and BSE impacted significantly on practice of BSE (Pearson chi2 p-values of 0.028, 0.037, 0.003 and 0.000 respectively). Finally, logistic regressions showed that only basic knowledge about BSE was associated with its practice. The relationship was strong (OR: 6.641; 95%CI: 2.823-15.620).

### Conclusion

The large majority of UOR's female students have basic knowledge about breast cancers and BSE. However, this fact is not automatically translated in a good appropriate health behavior meaning BSE. More effective sensitization has to be done in order to fix this health problem.

**Keywords:** breast cancer, breast self-examination, female students, butembo, Democratic Republic of Congo

## Introduction

Human cancer is a major public health problem worldwide despite that important historical evidence shows that it is avoidable.<sup>1,2</sup> The worldwide burden of cancer is no longer confined predominantly to the industrialized, wealthy countries but is spreading and will soon shift to low- and medium-resource countries.<sup>3</sup> Breast cancer is a malignant proliferation of epithelial cells lining the ducts or lobules of the breast. It is a hormone-dependent disease.<sup>4</sup> Women without functioning ovaries who never receive estrogen-replacement therapy do not develop breast cancer. It occurs mostly in women, but men can also be affected.<sup>5</sup> The female-male ratio is about 150:1.<sup>6</sup> It is one of the most commonly diagnosed cancers worldwide, which accounted for 1.7 million (11.9%) in 2012, and there were 6.3 million women alive who had been diagnosed with breast cancer in the past 5 years.<sup>5</sup> Despite an increased global effort to reduce the incidence, it continues to be the most common cancer and the second leading cause of cancer deaths in women in the United States of America (USA).<sup>5,7</sup> Recent

evidence suggests that its incidence has begun to decline in the USA.<sup>8</sup> Breast and cervical cancers are among the leading female cancers in Sub Saharan Africa.<sup>9-11</sup> Breast cancer incidence rate in that region was estimated to be around 25.5 per 100,000 and the mortality rate 19.3 per 100,000; for the Democratic Republic of Congo (DRC) the incidence rate was 23.5 per 100,000 during year 2012.<sup>12</sup> In odds with USA trend, the incidence of breast cancer rates is rapidly increasing in Africa.<sup>10,13-16</sup>

Early detection in order to improve breast cancer outcome and survival remains the cornerstone of breast cancer control.<sup>17</sup> Breast self-examination (BSE), an important component of the prevention, has been showed to empower women, taking responsibility for their own health.<sup>18</sup> BSE is a "procedure in which a woman inspects and examines her breasts and their accessory structures for evidence of change that could indicate an abnormal process". It is one of the three tests the American Cancer Society (ACS) recommends in order to help detect breast cancer in its earliest stages.<sup>5,6</sup> It is a

simple, very low-cost, non-invasive early detection method and the easiest and cost-effective way of early detection of breast cancer that should be done for all women older than 20 years.<sup>19-22</sup> Women should be strongly encouraged to examine their breasts monthly.<sup>6</sup> The recommended screening methods for early detection of breast cancer include a monthly BSE (10). Mortality from breast cancer could be reduced through early detection. Unfortunately, many studies show that only 20% to 25% of women routinely examine their breasts.<sup>23,24</sup> Despite the increasing incidence of breast cancer in sub-Saharan Africa,<sup>9,16,25</sup> little is known about BSE patterns in the continent.<sup>10,25,26</sup> Available publications on the subject include institutions-based such as hospitals and colleges.<sup>9-11,19,25</sup> This study aims to assess the levels of knowledge and practice of BSE among female students of the “Université Officielle de Ruwenzori” (UOR) a public college located at Butembo city, East of DRC. Potentially associated factors will be investigated.

## Materials and methods

### Setting

**Butembo:** a city of around one million people located in the East part of the DRC.

**UOR:** a public college with 1034 students during the academic period 2018 to 2019, a population distributed by sex as following: males (674; 61.18%), females (358; 34.62%). Eight faculties or schools are organized at the institution: Medicine, law, economics, engineering/applied sciences, sciences, social sciences, communications and information sciences and psychology.

### Design of the study

A period cross-sectional and university-based survey was adopted and conducted during the academic year 2018 to 2019. The tool adopted was a self-administered structured questionnaire with closed responses.

### Target and study populations

**Target population:** female students of the UOR.

**Study population:** Female students, aged 18 to 45 years, registered at UOR during the academic year 2018 to 2029 and physically present at Butembo city during the study period.

### Sampling and sample size

All eligible female students as defined above had to be included (universal sampling). At completion of the study 215 out of 358 were included (response rate: 60.00%).

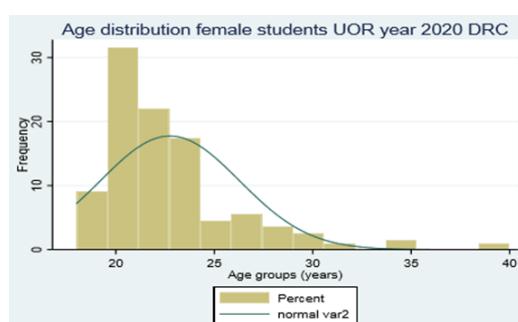
### Data management and statistical analysis

Variables consisted of selected socio demographics (age, ethnicity/tribe, residence, marital status, Faculty attended, academic levels and religion) and health-related factors (knowledge about breast cancers and BSE, value of BSE, technique of BSE, recommended frequency of BSE etc.). Data of interest were manually extracted from questionnaires. They then were transferred in a Microsoft Office Excel 2016 spreadsheet and finally in the statistical package Stata 15/IC. Data quality assessment was performed by a systematic check of possible abnormalities (missing values, outliers, impossible values, inconsistent values) fixed when present. Several variables were transformed in binary's ones. Analysis began by descriptive statistics including Shapiro-Wilk test for normality assessment of

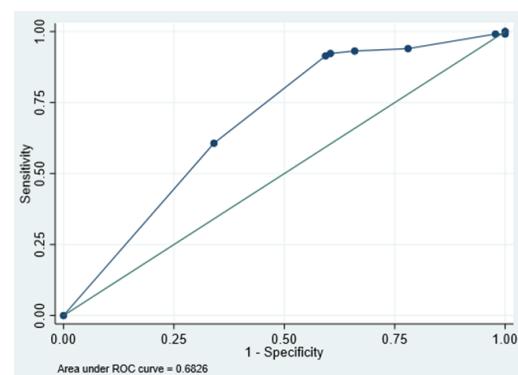
age. Then followed Pearson chi-squared test (binary variables). We finally performed multiple logistic regressions. Models building was based on the “backwise stepwise selection” technique while the post logistic Hosmer-Lemeshow test and ROC curve were used for model goodness-of-fit assessment. A p-value of <0.05 was considered significant. All the analyses were carried out by means of the statistical package STATA 15/IC.<sup>27</sup>

## Results

215 female students were included out of 358 eligible (response rate: 215/358=60.00%). The distribution of age's sample was not Gaussian (Shapiro-Wilk: p<0.00). Age mean and median were 22.74 years (95%CI: 22.25-23.24) and 22.00 years respectively. Most of them belong to Nande/Yira tribe (81.55%; 95%CI: 75.61%-86.31%), were attending the Faculty of Medicine (56.34%; 95%CI: 49.55%-62.90%) and are related to Catholic religion (53.49%; 95%CI: 46.75%-60.11%). Regarding health-related factors, the absolute majority of them showed to have some basic knowledge about breast cancer (96.74%; 95%CI: 93.29%-98.45%), BSE (79.44%; 95%CI: 73.45%-84.37%), the value of BSE for early detection of breast cancer (64.49%; 95%CI: 57.79%-70.66%) while only a slight majority reported having performed BSE at least once (55.71%; 95%CI: 48.88%-62.34%). Finally, the minority of them reported a family's history of breast cancer (18.22%; 95%CI: 13.57%-24.02%) and knew how to perform BSE (39.72%; 95%CI: 33.33%-46.48%). Bivariate analyses showed that factors associated to BSE were attendance of the Faculty of Medicine (Pearson chi2: p=0.028) and being resident at Butembo city (Pearson chi2: p=0.037) while in logistic regression only having basic knowledge about BSE significantly impacted BSE practice. Detailed results are presented in tables and figures below (Figures 1&2) (Tables 1-6).



**Figure 1** Age Distribution. var2=Age UOR= Université Officielle de Ruwenzori DRC=Democratic Republic of Congo.



**Figure 2** Post logistic regression ROC curve. ROC: Receiver operating curve.

**Table 1** Age (years) characteristics

Observ.	Pr (Skewness)	Min	Max	Q1	Q2 (median)	Q3	IQR	Mean	95%CI (mean)
196	0.000	18	40	21	22	23.5	2.5	22.74	22.25 23.24

Observ, observations Pr; p-value Min, minimum Max, maximum Q, quartile IQR, interquartile range CI, confidence interval %, percentage

**Table 2** Other socio demographics

Variables	Number of observations	Categories	Proportion	95% CI
Ethnicity	N=206	Nande/Yira	81.55%	75.61% 86.31%
		Other tribes	17.96%	13.27% 23.86%
		No determined	0.49%	0.07% 3.42%
Faculty	N=213	Medicine	56.34%	49.55% 62.90%
		Applied Sciences	3.76%	1.88% 7.37%
		Law	11.27%	7.64% 16.31%
		Economics	14.55%	10.40% 20.00%
		Psychology	8.92%	5.74% 13.61%
		Sciences	5.16%	2.87% 9.12%
		« Graduat » 1	30.05%	24.23% 36.59%
Academic level	N=213	« Graduat » 2	31.92%	25.97% 38.54%
		« Graduat » 3	16.43%	12.01% 22.08%
		« Licence » 1	17.84%	13.23% 23.62%
		« Licence » 2	3.76%	1.88% 7.37%
		Butembo city	95.77%	92.04% 97.80%
Residence	N=213	Other locations	2.35%	0.97% 5.55%
		No determined	1.88%	0.70% 4.93%
		Singles	88.79%	83.77% 92.39%
		Married or similars	9.81%	6.46% 14.63%
Marital status	N=214	Widower	0.47%	0.06% 3.29%

	Others	0.93%	0.23%	3.70%
Religion	Catholic	53.49%	46.75%	60.11%
N=215	Other christian groups	34.88%	28.76%	41.55%
	Islam	0.93%	0.23%	3.68%
	Other religions	9.30%	6.06%	14.02%
	No religion	1.40%	0.45%	4.27%

N, number of observations; %, percentage; CI, confidence interval

**Table 3** Health related factors

Variables	Number observations	Categories	Proportion	95% CI
Basic knowledge breast cancer	N=215	OUI	96.74%	93.29% 98.45%
		NON	3.26%	1.55% 6.71%
		Je ne sais pas/ Je ne me rappelle pas	0.00%	0.00% 0.00%
Basic knowledge BSE	N=215	OUI	79.44%	73.45% 84.37%
		NON	16.82%	12.35% 22.49%
		Je ne sais pas/Je ne rappelle pas	3.74%	1.87% 7.33%
Family's history of breast cancer	N=214	Yes	18.22%	13.57% 24.02%
		No	57.48%	50.70% 63.98%
		Don't know/ Don't remember		
BSE useful breast cancer early detection?	N=214	Yes	64.49%	57.79% 70.66%
		No	18.69%	13.98% 24.53%
		Don't know/ Don't remember		
Do you know how to perform BSE?	N=214	Yes	39.72%	33.33% 46.48%
		No	51.40%	44.67% 58.09%
		Don't know/ Don't remember		
		From birth	8.88%	5.71% 13.54%
		From puberty	3.85%	1.92% 7.54%
		>=20 years	57.69%	50.82% 64.28%
		>=30 years	6.73%	4.01% 11.09%
			0.48%	0.07% 3.38%

Table Continued...

Variables	Number observations	Categories	Proportion	95% CI	
Recommended age initiation BSE	N=215	After menopause	30.77%	24.83%	37.42%
		Don't know/ Don't remember	0.48%	0.07%	3.38%
		Daily	36.67%	30.37%	43.45%
		Weekly	15.71%	11.36%	21.33%
		Monthly	12.86%	8.94%	18.15%
Frequency recommended BSE	N=215	Yearly/annual	0.95%	0.24%	3.77%
		Don't know/ Don't remember	33.81%	27.69%	40.53%
		During menstruations	21.36%	16.25%	27.54%
Appropriate moment BSE	N=215	A week before menstruations	15.53%	11.17%	21.20%
		During pregnancy	0.97%	0.24%	3.84%
		During breastfeeding	6.80%	4.05%	11.19%
		Don't know/ Don't remember	55.34%	48.44%	62.04%
BSE performed at least once	N=215	Yes (n=117)	55.71%	48.88%	62.34%
		No	40.00%	33.54%	46.83%
		Don't know/ Don't remember	4.29%	2.23%	8.07%

N, number of observations; %, percentage; CI, confidence interval; BSE, breast self-examination

**Table 4** Association selected socio demographic factors and breast self-examination (bivariate analysis)

Factor	Categories	BSE n (%)	Pearson chi2
Ethnicity	Yira/Nande	89 (52.98%)	Pr=0.511
	Others	28 (58.33%)	
School/Department	Faculty of Medicine	73 (60.83%)	Pr=0.028
	Other Faculties	44 (45.83%)	
Academic level	“Licence”	23 (46.94%)	Pr=0.248
	“Graduat”	94 (56.29%)	
Residence	Butembo city	114 (55.88%)	Pr=0.037
	Others locations	3 (25.00%)	
Religion	Catholics	60 (56.44%)	Pr=0.531
Others religions	57 (56.44%)		

N, number of observations; %, Percentage; CI, confidence interval; BSE, breast self-examination;Pr, p-value

**Table 5** Association selected health-related factors and breast self-examination (bi variate analysis)

Factor	Categories	BSE n (%)	Pearson chi2
Basic knowledge breast cancer	Yes	117 (56.25%)	Pr = 0.003
	No	0 (0.00%)	
Family's history of breast cancer	Yes	23 (58.97%)	Pr = 0.506
	No	94 (53.11%)	
Basic knowledge BSE	Yes	109 (64.12%)	Pr = 0.000
	No	8 (17.39%)	

N, number of observations; %, percentage; CI, confidence interval; BSE, breast self-examination; Pr, p-value

**Table 6** Association selected factors and breast self-examination (Logistic regression)

BSE	Odds Ratio	Std. Err.	z	P>z	[95% Confidence Interval]
Faculty (reference=Medicine)	1.247	0.386	0.71	0.477	0.678 2.289
Residence (Reference=Butembo)	3.396	2.461	1.69	0.092	0.820 14.058
Entendu parler BSE	6.641	2.898	4.34	0.000	2.823 15.620
_cons	0.075	0.060	-3.23	0.001	0.015 0.360

BSE, breast self-examination logistic regression; Number of observations, 208 LR chi2(3)=29.64

Prob > chi2=0.0000 Log likelihood = -127.72519, Pseudo R2=0.1040 Logistic model for BSE, goodness-of-fit test, Number of observations = 208 Number of groups =4 Hosmer- Lemeshow chi2(2) =3.40 Prob > chi2 =0.1828

## Discussion

BSE is one of the most important screening modalities for early detection of breast tumors especially in resource-poor settings.<sup>10,25,26</sup> Although it has not been shown to reduce breast cancer mortality, it is a part of general body awareness in which women are familiar with the appearance of their breasts so that any irregular changes could be recognized and reported early.<sup>18</sup> Its importance cannot be overemphasized, especially when practiced adequately and effectively, in developing countries of Africa where there is limited access to preventive services. Female students of UOR seem to be well informed about breast cancer and BSE (96.74% and 79.44% respectively), a finding consistent with results from other studies in Africa.<sup>28</sup> However surprisingly only a slight majority (55.71%) of them reported having performed BSE at least once, a frequent human irrational behavior.<sup>25</sup> It is a worrying fact even because most of the interested female students are medical students therefore are assumed or expected to be not only better informed but also more aware about the value of BSE in the particular context of increasing breast cancer incidence.<sup>11</sup> However comparable pictures have been documented by studies elsewhere worldwide.<sup>19,29-31</sup>

This study shows no relationship between BSE practice and some potentially relevant factors: ethnicity, academic level, marital status, religion and family's history of breast cancer. The absence of association between BSE practice and a family's history of breast cancer is another interesting finding of our study consistent with several others worldwide.<sup>11,32-34</sup> Nonetheless, it is in odds with a comparable study from Ethiopia (19) another Sub Saharan country. In fact, one would expect from subjects having had the traumatic family's experience of cancer (breast cancer!) to be more aware about all possible means of prevention (early detection!) including BSE practice. Another finding from this study is a strong association between BSE practice and basic knowledge about BSE, a result consistent with those of studies by

other authors.<sup>35</sup> The absence of relationship between BSE practice and a family's history of breast cancer contrasts by all odds with its strong association with the fact that one had basic knowledge about BSE (OR=6.64; 95%CI: 2.82-15.62). It paradoxically seems that episodes of a so serious life-threatening disease are less impressive among that study population than simple information about BSE. Information biases can't be completely discarded or ruled out.

## Conclusion

Our study shows that despite that the majority of female students from that Congolese public college have basic knowledge about breast cancers and BSE this is not translated in the expected appropriate health behavior meaning BSE practice. Adequate strategies of sensitization should be identified and implemented in order to fix this serious health problem.

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## Conflicts of interest

The authors declare there are no conflicts of interest.

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