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Early Detection of Breast Cancer by Self-Examination in Cameroon: Knowledge, Attitudes and Practices Among Women With a Breast Lesion

Dépistage Précoce du Cancer du Sein par Auto-Examen au Cameroun : Connaissances, Attitudes et Pratiques des Femmes Avec une Lésion Mammaire

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RESUME
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ABSTRACT

Background. Despite the population's awareness of breast self-examination, the morbidity and mortality of breast cancer remain high. This study aims to assess the populations' knowledge and practices on breast self-examination in two hospitals in Yaounde, Cameroon. **Methods**. We conducted descriptive cross-sectional (quanlitative and qualitative) study from January to December 2019 at the Anathomo-Pathology Laboratory of Yaounde University Teaching Hospital and the Dominican Hospital Saint Martin de Pores in Yaounde. All consenting participant attending these laboratries were subjected to a pre-tested questionnaire to collect socio-demographic data and their knowledge on early detection of breast self-examination. These data were then analysed using Excel software and the results presented as proportions. **Results.** We enrolled 28 participants, their ages ranged from 19 to 62 years. Nineteen (67.86%) women were aware of the need to palpate their breasts to detect cancer, 12 (42.86%) practiced regularly among which 8 (28.57%) knew the procedure. Forteen (50%) had discovered a lump in their breast during routine palpation. At the time of discovery, 8 lumps (28.57%) were less than 2 centimeters of diameter. Twenty-two (78.57%) women consulted after one months of the lump discovery and the reason for the late consultation was the absence of pain. **Conclusion**. The causes of late diagnosis of breast cancer may be related to the poor knowledge of patients of the practice and importance of breast self-examination in the early diagnosis of breast cancer. Awareness of the importance and practice of breast self-examination is essential to improve breast cancer prognosis in Cameroon.

RÉSUMÉ

Contexte. Malgré la sensibilisation de la population à l'auto-examen des seins, la morbidité et la mortalité liées au cancer du sein restent élevées. Cette étude visait à évaluer les connaissances et les pratiques des populations en matière d'auto-examen des seins dans deux hôpitaux de Yaoundé, au Cameroun. **Méthodes.** Nous avons mené une étude transversale descriptive (quantitative et qualitative) de janvier à décembre 2019 au Laboratoire d'anatomo-pathologie de l'Hôpital Universitaire de Yaoundé et à l'Hôpital Dominicain Saint Martin de Porrès à Yaoundé. Toutes les participantes consentantes fréquentant ces laboratoires ont été soumises à un questionnaire pré-testé pour recueillir des données sociodémographiques et leurs connaissances sur le dépistage précoce par l'auto-examen des seins. Ces données ont ensuite été analysées à l'aide du logiciel Excel et les résultats présentés sous forme de proportions. **Résultats.** Nous avons recruté 28 participantes, âgées de 19 à 62 ans. Dix-neuf femmes (67,86 %) étaient conscientes de la nécessité de se palper les seins pour détecter un cancer, 12 (42,86 %) pratiquaient l'auto-examen régulièrement, dont 8 (28,57 %) connaissaient la procédure. Quatorze (50 %) avaient découvert une grosseur dans leur sein lors d'une palpation systématique. Au moment de la découverte, 8 grosseurs (28,57 %) avaient un diamètre inférieur à 2 centimètres. Vingt-deux femmes (78,57 %) ont consulté après un mois de la découverte de la masse et la raison de cette consultation tardive était l'absence de douleur. **Conclusion.** Les causes du diagnostic tardif du cancer du sein pourraient être liées à une mauvaise connaissance de la pratique et de l'importance de l'auto-examen des seins pour un diagnostic précoce. La sensibilisation à l'importance et à la pratique de l'auto-examen des seins est essentielle pour améliorer le pronostic du cancer du sein au Cameroun.

HIGHLIGHTS

What is already known on this topic

Breast self-examination is a costless and easy means of diagnosis of breast cancer (BC) recommended for poor countries.

What question this study addressed

The populations' knowledge and practices on breast self-examination in two hospitals in Yaounde, Cameroon.

What this study adds?

Low knowledge of BSE, low knowledge of BC and lack of awareness of BSE among the population are important causes of late diagnosis of BC in Cameroon.

How this is relevant to practice, policy or further research.

Raising the awareness of the importance and practice of breast self-examination is essential to improve breast cancer prognosis in Cameroon.

INTRODUCTION

According to Global Cancer Statistic (GLOBOCAN) 2020, Breast cancer (BC) is the most common cancer worldwide with an incidence of 2,261,419 or 11.7% of all cancers its incidence in 2020 was 4170 new cases, that`s 20.1% of all cancers, and its mortality 2108 cases, that`s 16% of all cancers [1].

BC is one of the cancers that can be detected at an early stage, as such, the World Health Organisation (WHO) recommends mammography as the first line of screening [2,3]. Mammography can detect non-palpable lesions of a few millimetres. Its use in developed countries as part of national breast cancer control programmes has made it possible to diagnose 80% of BC at early stage (stage I). At this stage, treatment is less aggressive and more affordable, thus allowing a survival rate of 90% and 82% respectively at 5 and 10 years in the United States, and 84% at 5 years in France [3–6]. Since mammography is not widely available in developing countries such as Cameroon, WHO recommends clinical examination and breast self-examination (BSE) as a second-line method. This method can detect nodules below 2 cm, corresponding to a BC of stage I [3].

BSE is a simple, non-invasive exam that can be performed by any woman. However, in Cameroon, mortality due to BC is still very high. Indeed, about 70-90% of cases are diagnosed at a late stage (Stage III and IV), with a survival rate of 30% and 13.2% respectively at 5 and 10 years [4,5]. Many efforts have been underway for several years to raise public awareness of early detection of this cancer by BSE [7,8]. However, this cancer remains the most frequent and deadliest of all cancers. In order to investigate the causes of this late diagnosis, this study was aimed at assessing patient`s basic knowledge of early detection of BC by BSE and health care seeking behaviour.

MATERIAL AND METHODS

Study design

We conducted a descriptive, cross-sectional mixt (quantitative and qualitative) study to investigate the causes of this late diagnosis.

Study setting and population

Study from January 1, 2019 to July 31, 2020 at the Yaoundé University Teaching Hospital (YUTH) and at the Dominican Hospital Saint Martin de Pores (DHSMP) in Yaoundé. The two health facilities have APL and they receive patients' refered from other health facilities of Yaounde and other regions of Cameroon for anatomo-pathologic sample analyse. Patients referred to the APL of these two health facilities for cytological analysis of a breast lump or nipple discharge, or for histological analysis of a biopsy of Breast lesion, breast lump or mastectomy sample were included.

Variables and procedure

The Variables were the size of the lump at the time of discovery by the participant, the circumstances of discovery and the reason for late consultation. The time between the discovery of the lesion and the first consultation was refered as "consultation delay (CD). The size of the lump was estimated in relation to common objects known to all participants such as lump (large lump, small lump). When the size was comparable to that of a small lump and large lumps, we estimated a diameter below 2cm, and between 2 and 5 cm respectively. When the participant reported a lump larger than a large lump, we estimated a diameter above 5cm. When the participant had consulted within one month of the discovery of the lump, the size of the lump was that indicated on the result of the radiological examination at the time it was performed.

Data collection tool

Using a pre-tested questionnaire administered by trained surveyors to patients, we collected data on the socio-demographic status of the participants, their basic and practical knowledge of early diagnosis of BC through BSE.

Sampling

After explaining the purpose and potential benefits of the study, patients who accepted to participate to the study and gave their verbal consent were recruited by consecutive and exhaustive sampling method. Patients who did not consent to the study or who chose to withdraw from the study for any reason were excluded

Ethical considerations

This study was conducted to identify basic knowledge of early detection of BC by BSE and health care seeking behaviour**.** We obtained ethical approval from the DHSMP and YUTH prior to the study implementation. All participants were informed of the objectives and procedures of the survey and Oral informed consent was obtained from each participant attending the DHSMP and YUTH APL. Patients were free to withdraw at any time without affecting their care. The data collected was confidential and intended for scientific use only.

Data analysis

All data were collected using technical sheet were entered and processed on SPSS 7.2 software. Tools used to appreciate our results were effective and proportions estimated with a 95% confidence interval.

RESULTS

A total of 28 women were enrolled in the study. Their age ranged from 19 to 62 years with an average of 36.6.

Socio-demographic data

Sociodemographic data are presented in the table I below The most represented age group was 31 to 40 years (46, 43%). Most participants had below 3 children 15 (53, 57%) and had attended at least secondary school (53, 57%) (Table 1).

Table 1: Distribution of the population according to socio-demographic data

Socio-demographic data	N	%
Age groups		
<30	8	28.57
31-40	13	46.43
41-50	6	21.43
>50	1	3.57
Parity		
≤2	15	53.57
≥3	13	46.43
Education level		
Primary	5	17.86
Secondary	15	53.57
University	8	28.57

Discovery of the breast lesion and knowledge of BSE

Circumstances of discovering the lesion and knowledge of BSE are presented on the table 2 below.

Fourteen (50%) nodules were discovered during BSE. Nineteen (67.86%) women were aware of the need to palpate their breasts to detect cancer; 12 (42.86%) women practiced breast self-examination regularly among which 8 (28.57%) knew the procedure (Table 2).

Table 2: Distribution of the population according to the circumstances of discovery of the nodule and the population's knowledge and practice of breast self-examination

Modalities	N	%
Circumstances of discovery		
During self palpation	14	50.0
Random discovery of the lump	11	39.30
Nipple discharge	3	10.70
Awareness of the need to palpate their breasts to detect cancer		
Yes	19	67.86
No	9	32.14
Frequency of self-breast examination		
Regularly	12	42.86
Sometimes	4	14.28
Never	12	42.86
Knowledge of the procedure		
Yes	8	28.57
No	20	85.71

Seeking care after discovering the lesion

All women sought care in a hospital.

The reason given for late consultation (after the month of discovery) by all the 22 participants which consulted after one month of discovery of the lesion was absence of pain.

The distribution of the population according to the diameter of the nodule at the time of its discovery, the CD and the reasons for the consultation are presented on Table 3 below. At the time of discovery, 16 lumps (57.14%) were between 2 and 5 cm in diameter, 22 (78.57%) consulted after the month of discovery among which, 6 (21.43%) were between the 12th and 18th month (Table 3).

Table 3: Distribution of the population according to the diameter of the nodule at the time of its discovery, the CD and the reasons for the consultation

Variables	N	%
Diameter of the lump at the time of discovery by the patient		
Less than 2 cm	8	28.57
Between 2 and 5 cm	16	57.14
More than 5 cm	1	3.57
Nipple discharge	3	10.71
Consultation delay aftter discovery		
Within one month of discovery	6	21.43
Between 2 and 5 months	12	42.85
Between 6 and 11 months	4	14.28
Between 12 and 18 months	6	21.43
Reasons for consulting		
« I was afraid it was cancer »	6	21.43
« As the lump increased, I was afraid it was cancer »	16	57.14
« I was worried because the lump was getting bigger and another one had come out in my armpit »	2	7.14
« My aunt's health had just been cut off because she had cancer and I was afraid that my lump would become cancerous too »	1	3.57
« A woman in my meeting had just died of breast cancer and I was afraid that my lump would become cancer too ».	2	7.14
« A woman in my village also had a lump that became cancer and she just died even though she had her breast cut off and that worried me »	1	3.57

DISCUSSION

Assessing patients' basic knowledge of early detection of breast cancer by self-examination

Our study population consisted of 28 participants, their ages ranged from 19 to 62 years with an average of 36.64 years. Breast cancer is increasingly found in young people in developing countries[4,5,7,9–11]. Some studies find an average age of 46.08±0.4 years [12], 46±15,87 years[13] and 47.5 ± 12.36 years with 66.1% of patients aged under 50 years[4]. Dinah A Tetteh et al in 2016 stated that the average age of diagnosis in developing countries is 10 years lower than the average age of diagnosis in developed countries [7]. The occurrence of BC among the young population increases the burden of this disease in this because a high proportion is of childbearing age, high birth rate, with an average number of children per woman of 2.6. In high-income countries, the age group of above 50 years is the most affected [3,5,7,9,14].

Nineteen (67.86%) participants knew that breast cancer can be detected by breast self-examinationIn the study by Fouelifack et al[15], 50% of the population knew. The difference in proportion between our two populations can be explained by the fact that Fouelifack worked on a

general population of 424 women, whereas we worked on a population of 28 women with a breast lesion. Forteen14 lumps (50%) were detected during BSE and 8 (28.57%) of these lumps were less than 2 cm. These results show that although BSE is not as effective as mammography [3,7,16], it allows the detection of breast lumps of less than 2 cm. If theses lumps are malignant, early management will improve the prognosis, making it possible to reduce the morbidity and mortality of breast cancer in low and middle income countries like Cameroon [17]. Morocco, a middle-income country, has adopted the clinical breast exam as the primary screening test for BC in their national control programme [18].

To be effective, BSE must be done on a regular basis (an average of one palpation per month) according to well-defined procedures[3]. In our study, 12 (42.86%) participants reported a regular breast self-examination and only 8 (28.57%) participants were aware of the procedure. Lumps smaller than 2 cm were found in 8 (28.57%) participants. This shows that if the population is well informed and aware of BSE, cancer will be diagnosed at an early stage in low and middle income countries where there is no cancer control programme and mammography is not affordable by everyone [7,16,19]. Da Costa Vieira et al in 2017 find that only 3 to 20% of women regularly perform BSE[17]. In the work of Halmata et al in 2021, 34.7% of its population knows about BSE but only 4% practice it regularly [20]. In a study conducted by Agbokey et al, although patients were aware of BSE, they were unable to perform it sufficiently to allow for early detection of this cancer [21]. Atanga Bi Suh et al in 2012, reported that only 35% of the population regularly perform BSE[22]. In the 2015 study by Shahin et al in Kenya, 41.6% of the population had heard of BSE but only 38.9% performed it regularly [23]. A survey conducted by Sama et al in 2017 showed that 47% of the respondents had heard of BSE and only 38.5% had ever practiced it [8]. In the study by Fouelifack et al, 32.3% of women knew that BSE can help detect breast cancer, 71.6% of participants had poor practice and only 1.2% practised it[15]. It is therefore essential to raise awareness and teach good breast self-examination practices.

Healthcare seeking

Upon discovering an abnormality in the breast, all women sought care in a hospital. This shows that despite the belief that cancer is a mystical disease in Africa and the frequentation of traditional medicine to seek treatment [17,21], the population knows that the diagnosis of BC is done in the hospital. However, only 6 participants (21.42%) had seek care within one month of the discovery of the lesion, the other participants had seek care between 2 and 18 months after the discovery of the lesion; average CD was 5.32 months. Espina et al reported in a study conducted 2017 that the average time to seek care after discovery of a breast lesion by the patient varies between 3.4 months and more than 6 months in Africa[5]. Dinah et al in 2016 [7] and Brinton et al [11] reported an average consultation time of 11 months. Da Costa et al in 2016 reported an average delay in developed countries of less than one month[17]. This may be one reason of the late diagnosis of BC in Cameroon and other low-income countries.

The reason for late consultation was the absence of pain. Pain is the clinical sign of any final stage cancer (stage IV). At this stage, the patient can only benefit from palliative care. This shows the poor knowledge of the participants on BC. In addition, other reasons were given by the participants: 6 (21.43) participants replied *« Since the lump was getting bigger, I was afraid it was cancer";* 2 (7.14%) other participants answered *"I was worried because the lump was getting bigger and another one had come out in my armpit».* The rapid growth of a nodule in the breast should raise the suspicion of invasive cancer and the appearance of axillary nodes should raise the suspicion of lymph node invasion. But we see from the behaviour of our participants that they do not know that they should not wait for clinical signs indicating BC to Seek health care. 1 (3.57%) other participant responded*: « My aunt's breast had just been cut off because she had cancer and I was afraid that my lump would become cancer too.* 2 (7.14%) other participants answered*: "A woman in my meeting had just died of breast cancer and I was afraid that my lump would also become cancer".* 1 (3.57%) last participant answered*: "A woman in my village also had a lump that became cancer; she just died even as her breast was cut off and that worried me.* This may also explain the fact that 90% of cancers are diagnosed at a late stage in our context [6,16] and also the high mortality due to BC in our environment [7,14,16,21]. In a context of poverty and absence of a cancer control programme like in Cameroon, the emphasis should be on raising awareness among the population so that they acquire basic knowledge enabling them to seek advice at an early stage of the disease. In the 2017 study by Babila Sama et al, 88.1% of the population had heard of BC but only 21.4% of this population knew the clinical signs and risk factors [8]. According to the Tagne et al study in 2020, 94.4% of the population had heard of BC, but 72% of this population had incorrect knowledge about risk factors, clinical signs and how to be screened [24]. A study by Foerster et al in 2019 showed that among patients diagnosed with BC, 84.2% of the population who had knowledge of BC accepted treatment while only 15.8% of the population who had no knowledge accepted treatment [25]. Furthermore, numerous studies have shown that a high proportion of the population in poor countries have heard of BC; however, their knowledge remains low [7,8,11,21,23,24]. In Cameroon, awareness raising is mainly done by associations and volunteers who do not always emphasize important elements such as the absolute interest of a consultation when they discover a breast nodule without other accompanying signs[7].

The responses of our patients point to the sociological theory of the "health belief model" of Charles Abraham and Paschal Sheeran, which states that the knowledge of a disease, the possibility and the methods of its early diagnosis by a population are key elements necessary to reduce morbidity and mortality from that disease in that population[26].

CONCLUSION

The majority of the study population is aware of breast self-examination as a method of early detection of breast cancer, but few know the procedure. Also, our population knows that BC is diagnosed in hospital, but the majority goes to hospital late due to low basic knowledge of this cancer. The reduction of morbidity and mortality of breast cancer in Cameroon can be achieved by improving the population's basic knowledge through awareness of this cancer and appropriate breast self-examination techniques.

Competing interests

The authors declare no competing interests.

Authors' contributions

Ingrid Teziwo: protocol design, development of data collection tools, data collection, analysis and interpretation; writing and review of the manuscript.
Fouelifack Ymele Florent: protocol design, development of data collection tools, supervision of data collection, writing and review of the manuscript.
Beyala Bita'a Landry: Data analysis, writing and review of the manuscript.
Buh Nkum Collins: Data analysis, writing and review of the manuscript
Nganwa Grace: writing and review of the manuscript
Etienne Guenou: writing and review of the manuscript
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Ketina Hirma Tchio-Nighie writing and review of the manuscript
Nsangou Ahmed Moustapha: writing and review of the manuscript
Neossi Nguena Mathurin: supervision of data collection, writing and review of the manuscript
Charlette Nangue: general supervision of the project, writing and review of the manuscript,.

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REFERENCES

1. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA: A Cancer Journal for Clinicians. 2021;71(3):209–49.
2. Hofvind S, Lee CI, Elmore JG. Stage-specific breast cancer incidence rates among participants and non-participants of a population-based mammographic screening program. Breast Cancer Res Treat. 2012 Aug 1;135(1):291–9.
3. Kolak A, Kamińska M, Sygit K, Budny A, Surdyka D, Kukiełka-Budny B, et al. Primary and secondary prevention of breast cancer. Ann Agric Environ Med. 2017 Dec 23;24(4):549–53.
4. Ngowa JDK, Kasia JM, Yomi J, Nana AN, Ngassam A, Domkam I, et al. Breast Cancer Survival in Cameroon: Analysis of a Cohort of 404 Patients at the Yaoundé General Hospital. Advances in Breast Cancer Research. 2015 Mar 30;4(2):44–52.
5. Espina C, McKenzie F, dos-Santos-Silva I. Delayed presentation and diagnosis of breast cancer in African women: a systematic review. Annals of Epidemiology. 2017 Oct 1;27(10):659-671.e7.
6. Dickens C, Joffe M, Jacobson J, Venter F, Schüz J, Cubasch H, et al. Stage at breast cancer diagnosis and distance from diagnostic hospital in a periurban setting: A South African public hospital case series of over 1,000 women. International Journal of Cancer. 2014;135(9):2173–82.
7. Sociocultural Factors and Breast Cancer in Sub-Saharan Africa: Implications for Diagnosis and Management - Dinah A Tetteh, Sandra L Faulkner, 2016 [Internet]. [cited 2022 Jun 14]. Available from: https://journals.sagepub.com/doi/10.2217/whe.15.76
8. Sama CB, Dzekem B, Kehbila J, Ekabe CJ, Vofo B, Abua NL, et al. Awareness of breast cancer and breast self-examination among female undergraduate students in a higher teachers training college in Cameroon. Pan Afr Med J. 2017;28:91.
9. Badr LK, Bourdeanu L, Alatrash M, Bekarian G. Breast Cancer Risk Factors: a Cross- Cultural Comparison between the West and the East. Asian Pacific Journal of Cancer Prevention. 2018 Aug 1;19(8):2109–16.
10. Balekouzou A, Yin P, Pamatika CM, Bishwajit G, Nambei SW, Djeintote M, et al. Epidemiology of breast cancer: retrospective study in the Central African Republic. BMC Public Health. 2016 Dec 7;16(1):1230.
11. Brinton LA, Figueroa JD, Awuah B, Yarney J, Wiafe S, Wood S, et al. Breast Cancer in Sub-Saharan Africa: Opportunities for Prevention. Breast Cancer Res Treat. 2014 Apr;144(3):467–78.
12. Sando Z, Fouogue JT, Fouelifack FY, Fouedjio JH, Mboudou ET, Essame JLO. Profil des cancers gynécologiques et mammaires à Yaoundé - Cameroun. The Pan African Medical Journal [Internet]. 2014 Jan 17 [cited 2022 Sep 15];17(28). Available from: https://www.panafrican-med-journal.com/content/article/17/28/full
13. Engbang JPN, Essome H, Koh VM, Simo G, Essam JDS, Mouelle AS, et al. Cancer du sein au Cameroun, profil histo-épidémiologique: à propos de 3044 cas. The Pan African Medical Journal [Internet]. 2015 Aug 4 [cited 2022 Jun 14];21(242). Available from: https://www.panafrican-med-journal.com/content/article/21/242/full
14. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2018 Nov;68(6):394–424.
15. Fouelifack FY, Binyom RP, Ofeh AM, Fouedjio JH, Mbu RE. Knowledge, Attitude and Practice of Breast Self-Examination amongst Women in Two Communities of Cameroon. OJOG. 2021;11(06):773–93.
16. Ministry of public health, Cameroon: National Strategic Plan for Prevention and Cancer Control 2020 – 2024. [Internet]. [cited 2022 Jun 14]. Available from: https://www.prb.org/wp-content/uploads/2020/06/Cameroun-PLAN-STRATEGIQUE-NATIONAL-DE-SANTE-NUMERIQUE_R%C3%A9duit.pdf
17. da Costa Vieira RA, Biller G, Uemura G, Ruiz CA, Curado MP. Breast cancer screening in developing countries. Clinics (Sao Paulo). 2017 Apr;72(4):244–53.
18. Association Lalla Salma de Lutte contre le Cancer. Royaume du Maroc, Ministère de la Santé, Guide de détection précoce des cancers du sein et du col de l'utérus. Edition 2011. [Internet]. [cited 2022 Jun 14]. Available from: https://www.contrelecancer.ma/fr/documents/guide-de-detection-precoce-des-cancers-du-sein-et-/
19. Dutch Breast Cancer Guideline 2012.pdf [Internet]. [cited 2022 Jun 14]. Available from:

https://www.oncoline.nl/uploaded/docs/mammacarcinoom/Dutch%20Breast%20Cancer%20Guideline%202012.pdf
20. Halmata M, Simo Tagne R, Nganwa Kembaou G, Baiguerel EM, Ndopwang LCC, Nwabo Kamdje AH, et al. Breast cancer awareness and screening practice amongst health personnel and general population of the littoral region of Cameroon. Heliyon. 2021 Jul 1;7(7):e07534.
21. Agbokey F, Kudzawu E, Dzodzomenyo M, Ae-Ngibise KA, Owusu-Agyei S, Asante KP. Knowledge and Health Seeking Behaviour of Breast Cancer Patients in Ghana. International Journal of Breast Cancer. 2019 Apr 1;2019:e5239840.
22. Suh MAB, Atashili J, Fuh EA, Eta VA. Breast Self-Examination and breast cancer awareness in women in developing countries: a survey of women in Buea, Cameroon. BMC Research Notes. 2012 Nov 9;5(1):627.
23. Sayed S, Moloo Z, Ngugi A, Allidina A, Ndumia R, Mutuiri A, et al. Breast Camps for Awareness and Early Diagnosis of Breast Cancer in Countries With Limited Resources: A Multidisciplinary Model From Kenya. Oncologist. 2016 Sep;21(9):1138–48.
24. Richard TS, Ndopwang LCC, Etet PFS, Kamdje AHN, Mohamadou H, Bruno TP, et al. Breast Cancer Awareness and Detection of Asymptomatic Cases Using Breast Palpation and Fine-needle Aspiration in Bafoussam, Cameroon. Asian Pacific Journal of Cancer Care. 2020 Feb 15;5(1):61–6.
25. Foerster M, Anderson BO, McKenzie F, Galukande M, Anele A, Adisa C, et al. Inequities in breast cancer treatment in sub-Saharan Africa: findings from a prospective multi-country observational study. Breast Cancer Research. 2019 Aug 13;21(1):93.
26. Abraham C, Sheeran P. The health belief model. In: Baum A, McManus C, Weinman J, Wallston K, West R, Newman S, et al., editors. Cambridge Handbook of Psychology, Health and Medicine [Internet]. 2nd ed. Cambridge: Cambridge University Press; 2007 [cited 2022 Nov 18]. p. 97–102. Available from: https://www.cambridge.org/core/books/cambridge-handbook-of-psychology-health-and-medicine/health-belief-model/785E55B196CA7846CBD4EE1B42C63CBD