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TELEMEDICINE AND ITS IMPACT ON BREAST CANCERSURVIVAL IN SUB-SAHARAN AFRICA

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ABSTRACT

Breast cancer is estimated to be the commonest cancer among women worldwide and forms a major part of global disease burden. Whilst the incidence of breast cancer is relatively low in SSA, its survival rates are however poorer compared to high income-countries. Findings from the study revealed that widespread late-stage diagnosis is a consistent pattern seen in SSA, explaining why the mortality rate is high and that through technology, patients can now receive quick, effective, and advanced service from healthcare professionals, even remotely.

Keywords: Telemedicine, Chemotherapy, Stigmatization, Meta-Analysis, Oncology.

I. INTRODUCTION

Telemedicine adopts electronic and information technology in the delivery of care and clinical services by health care professionals to populations in different locations [12]. In many countries, access to telemedicine services have continued to increase and expand with increasing portability reduced costs, improved usability and greater quality [41].

Many studies have shown at least an equal comparison between in-person care and the action of health care professionals and patients [22, 37]. Some other studies show improved outcomes with telemedicine when compared to in-person care [7].

A study from Massachusetts General Hospital reveals that patients reported that their Telemedicine visits and consultations were more engaging and fulfilling than in-person visits. Also, 62 percent of patients equate the quality of Telemedicine visits to in-person visits; 21 percent rated their Telemedicine visit experience higher [8].

Some other studies found out that patients are generally more relaxed and candid during a telemedicine visit as they don't have to leave their workplace, get stuck in traffic or sitfor about an hour in a waiting room, thereby making them feel better before consultation and help them to be honest about their self-care habits [8].

As stated by Schwamm [8], "Telehealth gives them moreof what they want most and gets rid of the stuff they don't want. With a telehealth visit, 95 percent of the time spent by the patient is face-to-face with the doctor, compared to less than 20 percent of a traditional visit, in which most time is spent traveling and waiting. These findings confirm that "whatpatients value most is uninterrupted time with their doctor."

There, therefore, is ample opportunity to explore theimpact of telemedicine on the diagnosis and management of chronic diseases like breast cancer which forms a major partof the global disease burden.

While the incidence of breast cancer remains the highest in high-income countries, the incidence continues to rise in low-income and middle-income nations including countries in sub-Saharan Africa (SSA) [2]. In 2018, breast cancer was the commonest cancer diagnosis made in women globally [6]. The survival rates for breast cancer are however poorer in low and middle-income countries when compared to high income-countries [19]. In 2012 for example, low and middle-income countries accounted for 53% of the newly diagnosed cases of breast cancer globally and around 58% of the deaths (IARC., 2012). This negative trend has been predicted to continue in the coming decades owing to the adoption of thelifestyles of HICs and an ageing population [2].

II. CHALLENGES IN BREAST CANCER MANAGEMENT IN SSAS

SSA is faced with many problems, some of which include high poverty levels, poor infrastructure, acute shortage of healthcare professionals, lack of political will from leaders and disproportionately high burden of disease [46]. These problems are even more emphasized consideringAfrica's rising population which has been projected to double in another 40 years [44]. The number of doctors per 100,000 people already deficient in

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most sub-Saharan African countries, will become even less with the projected population growth [47].

In SSA, there are myriads of barriers affecting access to oncology care. At the healthcare level, effective and appropriate oncology treatments are sparse, waiting times forchemotherapy are long and there is acute scarcity of facilitiesfor radiotherapy [42].

At the individual level, fear of treatment's side effects, fear of disfiguration and fear of stigmatization have all been well documented [31, 15]. This fear stems from belief that death or mastectomy is the aftermath of breast cancer diagnosis. This is the same for other types of cancer. The mention of word cancer itself generates fear with the perception that cancer is a life-threatening, incurable disease [48], not only in SSA but all over the world thereby evokingmyriad of negative emotions such as depression and anxiety among people [48].

In addition, spiritual and traditional healers continue to play a role in patients' receipt of conventional cancer care [28]. Most women in sub-Saharan African countries, especially those in the rural areas, believe that the traditionalmethod of treating diseases is more efficacious than modern method. This belief in indigenous health system is one of the causes of late presentation and treatment of breast cancer cases in SSA.

There are also some between-setting differences in accessto cancer treatments across SSA. In the prospective study byFoerster [15], it was found that while almost all women attending a specialized care centre in Namibia got treated irrespective of their socioeconomic status and race, one in three patients in two regional Nigerian hospitals and one in six patients in Uganda's main referral hospital had not commenced any form of treatment 1 year following their diagnosis. Surgery and/or chemotherapy are the major form of treatments, but also included radiotherapy for 67% of women at the Namibian Cancer Care Centre, it was discovered that there was a period when radiotherapy machine was not in operation for about one and a half year thereby and only 15% of women in Uganda were treated during this period.

According to Foerster [15], age also plays an important role in cancer treatments across SSA, it was observed that percentages of those receiving treatment are highest among 50–59year-old women. Those aged 70 and over, of which 6% have breast cancer, were least likely to be treated.

This therefore underlines the importance of making available population-wide affordable and accessible cancer care options in SSA.

Another problem with access to healthcare in SSA is the shortage of specialists especially in rural areas as most of them are found in large cities resulting in geographic inequalities in access to care [27].

III. STAGE AT DIAGNOSIS AND BREAST CANCER SURVIVAL

Breast cancer survival following diagnosis is one of the key criteria and important parameter that is used to assess thequality of cancer control associated with both early detection(prevention) and therapy [40].

The single most important determinant of survival incases of breast cancer is the stage at diagnosis with early-stage diagnosis associated with a better prognosis compared to late-stage diagnosis [3]. Increased early-stage diagnosis inaddition to advances in therapy has been identified as the major contributor to the large reduction in deaths from breast cancer in high-income countries [3]. Widespread late-stage diagnosis is however a consistent pattern seen in SSA, explaining why the mortality has largely remained unchanged [19].

There is enough evidence to support the notion that earlydiagnosis of breast cancer is directly related to lower costs ofcare and a higher rate of survival [5, 24]. The lower costs associated with early diagnosis is even more important in low-income countries where poverty affects health-seeking behaviour.

In the systematic review and meta-analysis by Jedy-Agba[19], they found 60% of women with breast cancer in sub- Saharan African present with late-stage disease between the 1970s and 2011.

A study by Ezeome [14] shows that the causes of delay between initial consultation and the definitive treatment are more than provider related. It was discovered that most patients refused to show up for their treatments majorly because they failed to understand the potential danger of the breast symptoms even after consultations with medicalprofessionals, together with fear of surgery.

For women in SSA, the breast is a significant part of a woman's identity, and it is not just a tissue that produces milkfor babies, not just a fashion symbol or sexual organ. It represents the pride of a wife and mother, therefore, losing thebreast could result in significant loss of their identity and femininity and this makes them to present it at an advanced stage [49].

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The presentation of most patients of breast cancer in sub-Saharan African at the late can also be related to the absence of structured detection policies, poor awareness, and poor facilities for timely and accurate diagnosis and treatment [4, 14, 25, 34, 35]. In a SSA study in 2014 by the London School of Hygiene and Tropical Medicine (LSHTM), and the International Agency for Research on Cancer (IARC) called the African Breast Cancer – Disparities in Outcomes (ABC- DO) study, advanced stage at diagnosis was linked to lower socio-economic status, delays in diagnosis and low levels of awareness of breast cancer [29, 30].

The distance to health-care facilities also represents one of the reasons why most patients are diagnosed late in sub- Saharan Africa [10]. People who reside far from healthcare centres are faced with unique challenges such as the financial burden associated with lodging and travelling, lack of options for care, disruption to family life, unmet psychological needs and difficulty in accessing important information [13, 20, 29, 43].

IV. TELEMEDICINE IN IMPROVING BREAST CANCER OUTCOMES IN SSAS

There are several models of telemedicine in oncology that have been designed to provide medical consultations, facilitate case conference discussions, multidisciplinary team meetings and tumour board meetings, supervise remote planning of treatment with radiotherapy and administration of chemotherapy [33, 36, 38, 39].

In a randomized controlled trial by Freeman [16], it was found that when live group sessions were compared to an audio-visual technology-based session for patients with breast cancer, there was no significant difference found between the two groups in terms of their quality of live, cognitive function, distress, fatigue, spirituality, and sleep. The authors therefore concluded that telehealth-based interventions can represent a feasible and effective strategy for cancer survival in areas that are remote.

Another systematic review by Dickinson [11] that focused on different follow-up technologies mostly in patients with breast cancer suggests that telephone follow-up when compared to face-to-face visits had equivalent safety and satisfaction levels as measured by health-related quality of life, symptoms and psychological distress.

It has become expedient to improve the survival rates of breast cancer patients in the SSAs which has been among the lowest in the world [3]. To achieve this, the Breast Health Initiative recommends a phased implementation approach where countries in sub-Saharan Africa will need to develop and strengthen targeted programs that ensure early diagnosis of symptomatic cases of breast cancer while also improving timely access to optimal treatment [15].

Technological services like telemedicine have become increasingly important in bridging the gap and overcoming the barriers of time, distance, and cost [1]. Through the technology, patients can now receive quick, effective, and advanced service from healthcare professionals.

In some countries in SSA, there has been significant progress in the adoption of telemedicine while progress is slow in places like Nigeria and Burkina Faso owing partly to the lack of political support [45].

In Nigeria, the government is working on implementing telemedicine infrastructure, though there are still some noticeable restrictions; one of these is the poor IT literacy among the senior and experienced medical professionals; another is lack of financial capacity of the Ministries of Health and corruption. Also, quite a number of sub-Saharan African countries are still unwilling to implement telemedicine because of capital-intensive nature but others are making progress [45].

Telemedicine can assist communities in SSA that are under-care, like those in rural and remote areas with few or no health care professionals or services, because it can overcome the barriers of time, cost and distance [9, 17, 32]. Several recent studies [17, 23] have suggested that if the accessibility to medical care through telemedicine is increased, then patients are more likely to look for treatment early and have better compliance with prescribed treatment which can positively affect their quality of life. As is the case with most chronic diseases, this early diagnosis can have a direct impact on survival in cases of breast cancer.

In one Italian study by Marino [26], telemedicine services were adopted in breast cancer screening using mobile screening units linked with at least 4 medical specialists. The program recruited 321 women that underwent breast cancer screening which showed 34.9% of them had benign lesions while 3.1% of them had suspicious malignant lesions. Of those with suspicious malignant lesions, 70% of them were eventually diagnosed with breast cancer following histological analyses. Considering that all those screened were

asymptomatic, it shows that telemedicine can be an effective tool in the detection of early breast cancer pathologies.

The impact of telemedicine in breast cancer is however not limited to screening. In a meta-analysis by Chen [7], thatincluded a total of 2190 participants, the study found telehealth interventions superior to conventional care in patients with breast cancer as it improved their self-efficacy, quality of life, while it reduced depression, stress and distress.

There are both technological and non-technological challenges that militate against the widespread adoption of telemedicine in SSA [45]. The main technological challengehas been the absence of infrastructure that will host telemedicine projects while the non-technological challenges include the unavailability of government or regulatory policies to address the possible ethical issues like concerns on privacy during the use of telemedicine [45].

V. CONCLUSION

It is evident that the main determinant of survival in casesof breast cancer is the stage at diagnosis with early-stage diagnosis associated with a better treatment and managementcompared to late-stage diagnosis. However, women in SSA usually detect breast cancer late because of various factorssuch as lack of awareness by women who in most cases have limited or no knowledge whatsoever about the risk of breast cancer, poor access to health care facilities and lack of IT infrastructure to bridge the access gap.

Using Telemedicine, health care practitioners can provide diagnoses and treatment plans for rural patients remotely, sothey necessarily will not have need to travel to city health center for treatment. There are apparent challenges to the adoption of Telemedicine in SSA, however, these challenges are not unsurmountable. If governments in SSA implement policies that can encourage the growth of telemedicine; provide infrastructure needed to set up Telemedicine system in hospitals and health centers; provide funding to maintain the infrastructure; train healthcare workers on how to use the system; create the necessary awareness at community levels;and encourage private investments in the sector; there can be a positive impact on not only breast cancer survival, but on the reduction of disease burden.

In fact, the shortage of healthcare professionals in sub- Saharan African countries provides specific rationale for implementation of Telemedicine services. SSA countries canleverage on the power of Telemedicine technology to help redistribute the oncology work force, where needed.

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