



Breast Cancer Disparities and the Digital Divide

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Abstract

Purpose of Review Socioeconomically disadvantaged populations and minority groups suffer from high breast cancer mortality, a disparity caused by decreased access to specialty care, lower treatment adherence, co-morbidities, and genetic predisposition for biologically aggressive breast tumor subtypes. Telehealth has the potential to mitigate breast cancer disparities by increasing access to specialty care and health information. However, unequal access to high-speed/broadband internet service and telehealth itself magnifies breast cancer disparities in vulnerable populations. This review evaluates the impact of the digital divide on breast cancer outcomes, as well as strategies for leveraging telehealth to reduce breast cancer disparities.

Recent Findings There is a paucity of research specific to employing telehealth to address breast cancer disparities. Previous studies provide examples of telehealth utilization for increasing screening mammography, in addition to improving access to breast cancer care, including breast cancer specialist, nurse navigators, and clinical trials. Telehealth can also be used as an approach to risk reduction, with strategies to support weight management and genetic testing.

Summary Eliminating the digital divide holds enormous potential for mitigating breast cancer disparities through an intentional focus on improving access to telehealth. With increased accessibility, resource allocation, and improved digital infrastructure, telehealth can be used to address disparities in early detection, quality of breast cancer care, treatment adherence, and risk assessment. Further research is essential to elucidate best practices in breast cancer telehealth approaches in underserved communities.

Keywords Disparities · Telehealth · Breast cancer · Digital divide · COVID-19

Introduction

The COVID-19 pandemic was a catalyst for expanded utilization of telemedicine; however, it also uncovered additional racial disparities within the American healthcare system and among communities nationwide [1, 2]. Non-urgent aspects of breast cancer care were reallocated to remote services or postponed to minimize infectious exposure and maximize hospital capacity for emergencies [3–5]. This phenomenon highlighted potential

advantages to incorporating telemedicine into long-term health-care, while also underscoring the significance and impact of the digital divide on healthcare access [6].

One in 8 women will be diagnosed with breast cancer in their lifetime [7]. Compared to relatively affluent and White American patients, low-income populations and minorities suffer from higher breast cancer mortality, a disparity caused by decreased access to specialty care, lower treatment adherence, co-morbidities, and genetic predisposition for biologically aggressive breast tumor subtypes [7]. Telehealth has the potential to mitigate breast cancer disparities by increasing access to specialty care and health information. However, unequal access to high-speed/broadband internet service and telehealth itself magnifies breast cancer disparities in vulnerable populations. There is a paucity of research specific to telehealth disparities in breast cancer. This review evaluates the impact of the digital divide in breast cancer, as well as strategies to leverage telehealth to improve the breast health and address breast cancer disparities in vulnerable populations.

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The Digital Divide

Access

Telehealth refers to clinical and non-clinical technology services, encompassing telephone calls, videos, video conferences, and digital communication, while telemedicine involves technology related to direct services to patients [8]. Over 120 million households have access to broadband internet in the United States; however, racial minorities, low-income populations, and rural communities use the internet and technology at a significantly lower rate [9].

During the COVID-19 pandemic, many aspects of breast cancer care were shifted to telehealth, including visits for initial evaluation, postoperative follow-up, oral chemotherapy/endocrine therapy treatment, radiation oncology, and survivorship [10–18]. Accounting for differential access to compatible devices, broadband internet, technological literacy, and provider reimbursement, at least one in every four Americans did not have access to the technology and digital literacy essential to engage in telehealth visits. Historically underserved populations are especially vulnerable to these disparities and therefore faced numerous barriers to telehealth utilization. It is imperative that the digital divide is addressed strategically as we seek broad implementation of telehealth services across the continuum of breast cancer care [9].

Strategies to Increase Accessibility

Despite inequities in technology, there is enormous potential for telehealth to bridge gaps in breast cancer disparities through increased access and connectivity. With appropriately allocated resources, studies have reported that telehealth was useful among minority populations to increase social support, monitor post-operative symptoms and treatment adherence, and support survivorship [19–23]. Racial minorities reported greater satisfaction with telehealth appointments for oncology versus in-person visits [24, 25•]. In addition, at least one study found that underserved women used telehealth more frequently than affluent women when provided with the relevant materials and technology, emphasizing the importance of resource allocation, policy, and community outreach to increase telehealth access in underserved populations [26].

Increased digital infrastructure can be supported by government-funded initiatives, private companies, and community outreach. This includes resource allocation through tablet loan programs and remote video telehealth clinics. In 2018, the Pittsburgh Healthcare System of the United States Department of Veterans Affairs developed a Virtual

Cancer Care Network, facilitating virtual oncology care at a tertiary center [27•]. Veterans' affairs also partnered with large corporations like T-Mobile and Walmart to provide telehealth services in retail stores [28]. Previous studies also found community outreach focused on identifying free public Wi-Fi locations helped patients connect for virtual visits, while nurse navigator programs successfully assisted patients with technical issues [29]. These findings highlight the impact of developing sustainable technology infrastructure in communities and the need for increased community outreach and policy to support similar initiatives.

Digital literacy is also central to telehealth's utility. Patients over 65 and those with low education have less digital literacy and more anxiety about using telehealth [30, 31]. The importance of improving digital literacy has been recognized nationally with recent efforts from the Department of Education to reinstate the Community Technology Centers (CTC) program that provides underserved communities with information technology and training to improve use. Previous studies have also shown that patients over 65 adopt telehealth well with instruction and practice models, identifying a critical opportunity for nurse navigators to aid in digital literacy programs to improve telehealth utilization. In fact, studies assessing patient comfort with telehealth revealed increases in patient satisfaction with increased use, emphasizing the importance of practice models and nurse navigators to facilitate digital learning, increased telehealth utility, and improved patient satisfaction [31, 32•].

The likelihood that providers will adopt telehealth services is impacted by liability, licensure reimbursement, and concerns about limitations related to the absence of physical exam, decreased ability to bond via in-person/face-to-face interaction, and decreased patient comprehension [33–35]. Strategies to increase telehealth effectiveness must therefore also include increased education at the provider level. During the COVID-19 pandemic, reimbursement for telehealth services was expanded, including Medicare and Medicaid coverage plans, and allowance of telehealth across state lines. Further investment in reimbursement must be prioritized to ensure adequate payment for telehealth services as well as equity in pay in comparison to in-person visits [36].

Disparities in Detection and Early Diagnosis

Breast Cancer Screening

Some studies have demonstrated that low-income women and racial/ethnic minorities including African Americans, Hispanics, and Native Americans/American Indians utilize

screening mammography at a lower rate [37, 38]. These same groups also present with later-stage disease. African Americans have the highest breast cancer mortality rates compared to other population subsets in the United States [39, 40]. Screening mammography mitigates disparities in breast cancer mortality through early detection [41]. For these reasons, some societies have advocated for initiation of screening at younger ages for African American women. Patient and provider-level barriers to equitable breast cancer screening include lack of knowledge of guidelines, lack of awareness of personal health records, geographic barriers to accessing imaging centers, financial burdens, and employment conflicts [42].

Screening and Telehealth

Multiple telehealth approaches have been effective at increasing screening utilization. Offman et al. demonstrated effectiveness of automated telephone reminders to underserved urban populations [43]. Health maintenance information pooled from electronic health records and delivered as automated reminders for screening has been similarly effective. In addition, mobile apps have been used to notify patients of screening status and employ remote nurse navigators to aid in scheduling and appointment coordination, which was particularly useful for navigating cultural differences in minority communities [44, 45].

Despite scheduling reminders, geographic access to screening facilities remains as a barrier to breast cancer screening. Mobile mammography has been one of the most effective strategies to improve screening in underserved communities and among African Americans, Hispanic Americans, American Indians, low-income, underinsured, and rural communities [46]. Similar to telephone or app-based appointment reminders improving adherence, telehealth for mobile mammography visits could be used to further facilitate screening use by facilitating appointments, reminders, and location tracking [47].

In this way, telehealth can be leveraged to make screening programs more robust and increase early detection in underserved communities, which could prove particularly useful in accommodating increased need post-pandemic. Screening is particularly important in the context of recovery from reduced screening capacity during the peak of the COVID-19 pandemic—a phenomenon accounting for an approximate deficit of 3.9 million breast cancer screenings in the US [48, 49]. After imaging centers reopened, studies found that rates of screening were disproportionately low among Hispanic and Black populations [50], warranting intentional focus on screening in underserved communities post-pandemic.

Disparities in Access to Treatment

Access

It is well documented that individuals residing in rural settings, racial/ethnic minorities, and underinsured patients are more likely to face disparities in access to specialty breast cancer care and lower treatment adherence [51, 52]. During the COVID-19 pandemic surge, patients presenting for breast cancer treatment were triaged to different care strategies based upon risk stratified models [5]. Those determined to have relatively “low-risk” breast cancer were considered for telephone consultations, while patients considered to have higher risk disease (e.g., those requiring chemotherapy) were triaged to in-person care; the triage process itself was typically handled remotely [5]. Telehealth was in this way utilized for evaluation, follow-up, and symptom monitoring of patients undergoing active treatment with chemotherapy, biological agents, and endocrine therapy.

Increased telehealth in breast cancer treatment during the pandemic demonstrated the critical importance of internet access, connectivity, and communication among patients and providers. This experience supports the findings of several studies highlighting telehealth’s utility in breast cancer treatment. For example, telephone counseling and apps have been shown to decrease cancer-related stress, improve pain management, and increase social support among patients in medically underserved areas [21, 29, 53]. Additionally, telehealth was found to be effective peri-operatively and postoperatively as well as for rehabilitation services [54, 55]. Among breast cancer patients who used telehealth during the pandemic, telehealth services were perceived as increasing access, improving health, and saving time [56]. Few studies however have evaluated racial minorities in the context of socioeconomic, cultural, and language barriers. Although some studies focused on cultural sensitivity in telehealth and app development, further research is warranted to better understand the best methods to employ telehealth in breast cancer care long-term in underserved populations [23, 57].

Nurse Navigators

Nurse navigators have been critical in providing support, coordinating patient-provider communication, and mitigating overall disparities in minority breast cancer care, as racial minorities and underserved patients have less access to support systems during treatment and lower treatment adherence [52]. Remote nurse navigators are particularly

important among minority patients who may otherwise be deterred from telehealth services as they face barriers related to language, technological literacy, and mistrust of the medical system [58]. Patient navigators have successfully helped manage pain, emotional support, appointment scheduling, and interpretation of results and are well established in the oncologic community. This model can be further strengthened in approaches to navigating telehealth services, including resource support and instruction to improve digital literacy.

Multidisciplinary Conference

Breast cancer treatment is multidisciplinary. Treatment involves consideration of genetic testing, surgical resection, reconstruction, chemotherapy, endocrine therapy, and radiation treatment. This involves the coordination between genetic counselors, breast surgeons, plastic surgeons, medical oncologist, and radiation oncologists. Minorities and underserved populations have less access to specialty care. Additionally, barriers related to work leave, childcare, transportation, and cost compound the impact of patient appointments. Coordination of individualized breast cancer treatment through multidisciplinary conferences (MDC) improves breast cancer outcomes. Several studies report using videoconferencing for MDC to bring specialized care to remote areas [1]. Increased use of telehealth for MDC among providers could improve communication between providers while increasing access to specialty care and improving efficiency of follow-ups among patients.

Clinical Trials

Clinical oncology trials are critical for the advancement of cancer treatment and patient care. The NIH Revitalization Act of 1993 mandated the inclusion of women and minorities in NIH clinical trials [59, 60]. Despite nationwide efforts to address minority clinical trial enrollment, the accrual of African American (AA) and Hispanic Americans (HA) remains significantly lower when compared to White American (WA) patients [61]. Most clinical trials are aimed at reflecting demographics of the general population. As racial minorities are overrepresented in advanced-stage cancers, clinical oncology trials should be aimed at proportionally enrolling higher rates of AA and HA patients, yet minorities remain disproportionately underrepresented [62].

Underrepresentation in clinical trials contributes to racial disparities, as scientific advancements have limited applicability in diverse populations. Barriers to minority accrual include availability and awareness of clinical trials, supportive infrastructure, strict eligibility criteria,

and bias; however, electronic health records are an opportunity to identify cohorts, coordinate recruitment, and standardize enrollment efforts [63–65]. Increased awareness and knowledge of clinical trials through portal messaging has the potential to increase trial opportunities within minority communities [66–68]. Additionally, electronic patient-reported outcome systems allow clinicians to monitor symptoms in real time through online questions, downloadable questions, or telephone technologies [58]. Digital strategies to reduce complications and monitor symptoms can in this way be employed to reduce distress and trigger early medical intervention for concerning symptoms.

Survivorship and Risk Reduction

Breast Cancer and BMI

It is important to consider breast cancer primary and secondary prevention strategies in women, especially among those who are at high risk. A study by Pruthi et al. in 2013 found video telemedicine to be successful in risk-reducing strategies among Alaskan natives [20], Hispanic women [21, 22, 69], and African American women [53, 70].

Obesity is associated with increased risk of breast cancer, as well as later stage at diagnosis and poorer prognosis. Higher body mass index is particularly linked with breast cancer risk in African American women, making weight loss strategies a crucial focus among modifiable risk factors in breast cancer and in breast cancer disparities. Many mobile apps target weight loss and have been trialed in breast cancer patients, with success among minority populations. Oncology patients who engage in regular exercise were found to have better quality of life, reduced depression and anxiety, and decreased recurrence [6, 63–76]. These apps provide tools to track weight loss, monitor exercise and intake, and provide support; however, the majority of previous studies involve the application of these telehealth services among breast cancer survivors. Knowing the role of risk reduction and prevention of breast cancer, these apps could be further utilized to increase understanding of the correlation between breast cancer and obesity, as well as provide tools to reduce risk in the general population.

Genetic Testing

Another proposed method of increasing telehealth accessibility is prioritization of audio-only telephone services that do not require internet connection. This approach works well for certain specialties like telegenetics, the remote delivery of genetic counseling. Telegenetics increases access to genetic counseling and was explored

even prior to the pandemic, as it offers similar diagnostic accuracy to in-person counseling [31, 77]. Discerning genetic mutations is essential to breast cancer treatment and patient outcomes due to its influences on screening recommendations, options for chemoprevention, prophylactic resections, and treatment with poly ADP ribose inhibitors. African Americans are 40% more likely to die from breast cancer, which is partially explained by genetic predisposition to triple-negative breast cancer (TNBC), an aggressive subtype linked to West African ancestry and associated with BRCA-1 germline mutations [78, 79].

With increased access through telegenetics, genetic testing has the potential for large-scale impact on precision medicine. Insurance policies to cover more extensive breast cancer panels should accordingly be expanded for high-risk patients. Recent guidelines released by the American Society of Breast Surgeons recommend all breast cancer patients are offered genetic testing [4]. Increased eligibility in comparison to commonly used NCCN genetic testing guidelines is based on evidence of high prevalence of genetic mutations among those who would be ineligible using NCCN guidelines—many of whom are disproportionately African American due to reduced completion of family history [80]. Identifying genetic mutations in patients with African ancestry is crucial to mitigating risk and improving outcomes with more treatment options.

Conclusion/Next Steps

Telehealth interventions have been utilized for breast cancer care for a wide range of applications and across diverse populations; however, there is a paucity of research specific to telehealth disparities in breast cancer. Telehealth holds enormous potential to mitigate breast cancer disparities through intentional focus on eliminating the digital divide. With increased accessibility, resource allocation, and improved digital infrastructure, telehealth can be used to address disparities in early detection, stage at presentation, treatment adherence, genetic testing, and recurrence. Further research is essential to elucidate best practices in breast cancer telehealth approaches in underserved communities.

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Declarations

Ethics approval This article does not contain any studies with human or animal subjects performed by any of the authors.

Competing Interests The authors declare no competing interests.

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