Journal of Cancer Therapy and Research

Genesis-JCTR-4(1)-35
Volume 4 | Issue 1
Open Access
ISSN: 2583-6552

Navigating Breast Cancer in South Asia: Interconnected Challenges and Collaborative Solutions

Hira Sarwar*
Chief Editor of World Affairs Insider, a post graduate scholar from University of Karachi, Pakistan

***Corresponding Author**: Hira Sarwar, Chief editor of World Affairs Insider, a post graduate scholar from University of Karachi, Pakistan.

Citation: Sarwar H, Navigating Breast Cancer in South Asia: Interconnected Challenges and Collaborative Solutions. J Can Ther Res. 4(1):1-10.

Received: August 19, 2024 | **Published**: September 26, 2024

Abstract

Breast cancer is a severe health concern in South Asia, compounded by fast-rising incidence rates caused by changing lifestyles and diets. In Pakistan, one in nine women faces a lifetime risk of diagnosis, marking the highest incidence among Asian nations. The World Health Organization reports a steady rise in cancer incidence in Pakistan, with 24.1% of Pakistani women diagnosed with breast cancer in 2023. Similarly, in India, breast cancer is the most common cancer among women, accounting for 28.2% of all female cancers, with an estimated 216,108 cases by 2022. The prevalence of breast cancer has been 32.8% in Bangladesh for the last 5 years and is responsible for about 69% of women's deaths. This public health dilemma goes beyond medical boundaries, requiring regional and global cooperation to solve interrelated challenges. Misconceptions and social and cultural barriers regarding breast cancer greatly delay medical action, which leads to diagnosis at an advanced stage and lower survival rates. To promote early detection techniques, dispelling myths through educational initiatives that encourage open conversations is crucial. Access to healthcare is an important issue, exacerbated by poor infrastructure and the lack of population-based screening programs, resulting in delayed diagnoses. Financial hardships make gaps in healthcare access even worse, as many women cannot afford necessary tests and treatments. Comprehensive methods, including community-based programs, monetary assistance, and telemedicine, are essential to close these gaps and promote equitable healthcare delivery.

***DOI*:** https://doi.org/10.52793/JCTR.2024.4(1)-35

Mental health support is critical at this challenging time, especially since breast cancer frequently strikes women during their reproductive years, when they may also be raising children. To develop healthcare systems and enhance outcomes, regional collaboration is essential for exchanging best practices and resources. Finally, combating breast cancer in South Asian countries needs a comprehensive approach that covers cultural, educational, economic, and healthcare issues. Women confronting this health issue can benefit significantly from our improved early detection, more accessible treatment options, and comprehensive initiatives that promote collaboration. The present abstract emphasizes the pressing requirement for global focus and concerted endeavors to alleviate the consequences of breast cancer on the health and welfare of women residing in this region.

Keywords

Breast Cancer; South Asia; History of Breast Cancer; Healthcare infracstructure

Introduction

Breast cancer, a disease that has afflicted humankind for millennia, has been documented in nearly every period of recorded history. Its visibility, particularly in advanced stages where tumors become palpable and prominent, has made it a subject of medical attention since ancient times. Breast cancer cells begin inside the milk ducts and/or the milk-producing lobules of the breast [1]. The earliest form (in situ) is not life-threatening and can be detected in early stages. If left unchecked, the tumors can spread throughout the body and become fatal.

Early detection of breast cancer is crucial because, in its initial stages, the disease often presents no symptoms. Regular screening and awareness can significantly improve outcomes, as treatment is more effective when cancer is identified before it progresses. Symptoms of breast cancer become more noticeable as the disease advances and can include a lump or thickening in the breast, changes in breast size or shape, skin alterations like dimpling or redness, changes in the nipple or areola, and abnormal or bloody discharge from the nipple [2]. Even if a lump is not painful, it is important to seek medical evaluation, as most lumps are benign but early diagnosis of malignant ones increases the chances of successful treatment. Cancer cells can invade nearby breast tissue, forming tumors and potentially spreading to lymph nodes and other organs. Early detection helps in managing and treating the cancer before it metastasizes to distant sites like the lungs, liver, brain, or bones, where it can cause severe symptoms and become life-threatening. However, the cultural taboos and societal embarrassment surrounding breast cancer historically contributed to the rarity of its detection, diagnosis, and discussion outside of medical literature. It is only in recent decades that breast cancer awareness has become more widespread, particularly following the adoption of the pink ribbon as a symbol of the fight against the disease in the 1990s.

Globally, breast cancer incidence has doubled between 1970 and 2024. In 1970, the global incidence rate was approximately 68 cases per 100,000 women, which increased to around 132 cases per 100,000

women by 2024. Approximately 670,000 new cases were reported worldwide; by 2024, this figure had escalated to over 2.3 million annually [3]. The mortality rate also gradually increased, although advancements in treatment and early detection have helped stabilize mortality rates in many developed countries. Across the Asian continent, breast cancer constitutes a substantial portion of the cancer burden. In 2019, China had the highest number of cancer cases in Asia, with 4.8 million new diagnoses and 2.7 million deaths, followed by Japan, which ranked third with 887,300 new cases and 437,700 deaths [4]. The incidence rates in Asia are escalating faster than in Western countries, primarily driven by changes in lifestyle, dietary habits, and reproductive patterns. In South Asia, the situation is particularly alarming. According to WHO, India reported a breast cancer incidence rate of 25.8 per 100,000 women, with around 178,361 new cases, making it the most common cancer among Indian women [5].

In Pakistan, the incidence rate was even higher at 38 per 100,000 women, with over 90,000 new cases reported annually [6]. Both India and Pakistan have witnessed a two- to three-fold increase in breast cancer cases since the 1970s. Bangladesh also faces a significant challenge, with breast cancer being the leading cause of cancer-related deaths among women, accounting for 6.2% of all cancers and 19% of all female cancers [7]. In Nepal, breast cancer accounted for 1,973 of the estimated 20,508 cancer cases in 2020, making it the second most common cancer type in the country [8]. Afghanistan reported 3,173 new breast cancer cases in 2020, with 1,783 women succumbing to the disease, making it the most commonly diagnosed cancer and the second deadliest after stomach cancer [9].

Other South Asian countries, such as Bhutan and Sri Lanka, have also seen significant rises in breast cancer incidence. However, the rates vary due to differences in healthcare infrastructure and awareness levels. Breast Cancer can be attributed to several factors, including increased life expectancy, urbanization, changes in reproductive behaviors (such as delayed childbirth and reduced breastfeeding), and lifestyle factors like obesity, alcohol consumption, depression, overburden to work, or physical inactivity. Despite these rising trends, many Asian countries lack population-based breast cancer screening programs, resulting in late-stage diagnoses and poorer treatment outcomes compared to Western nations. The prevalence of hormone receptor-negative tumors and higher-grade cancers further complicates the treatment landscape in Asia.

Methods

This research article synthesizes data from various sources, including WHO reports, national cancer registries, academic studies, and breast cancer survival conversations at Shuakat Khanum Cancer Hospital Lahore, to analyze the current state of breast cancer, determine the challenges, and find solutions in South Asian Countries.

History of Breast Cancer

Ancient Greece and Egypt

The earliest records of breast cancer date back over 3,500 years to ancient Egypt [10]. The condition was described in medical papyri, such as the Edwin Smith and George Ebers papyri, which detailed "bulging tumors of the breast" that were deemed incurable. In 460 B.C., Hippocrates, often called the father of Western medicine, described breast cancer as a humoral disease. He theorized that the human body

DOI: https://doi.org/10.52793/JCTR.2024.4(1)-35

consisted of four humors—blood, phlegm, yellow bile, and black bile—and that an excess of black bile caused cancer. The black, hard tumors associated with breast cancer appeared to confirm his theory, as they would often burst, releasing a black fluid. Hippocrates named the disease "karkinos," the Greek word for crab, because the tumors seemed to have tentacles resembling the legs of a crab. By A.D. 200, Galen, another prominent figure in ancient medicine, expanded on Hippocrates' theories. He agreed that black bile caused cancer but posited that some tumors were more dangerous than others. Galen recommended treatments such as opium, castor oil, licorice, sulfur, and salves. However, surgery was not considered an option since breast cancer was viewed as a systemic disease affecting the entire body.

Breast Cancer in the 17th and 18th Centuries

For centuries, Galen's theories on breast cancer were widely accepted. It wasn't until 1680 that Francois de la Boe Sylvius, a French physician, began to challenge the humoral theory. Sylvius proposed that cancer was not due to an excess of black bile but rather a chemical process that transformed lymphatic fluids from acidic to acrid. In the 1730s, Parisian physician Claude-Deshais Gendron further refuted Galen's systemic theory, suggesting that cancer developed from the interaction of nerve and glandular tissue with lymph vessels. During this period, various theories emerged about the causes of breast cancer. Bernardino Ramazzini, in 1713, hypothesized that the high frequency of breast cancer among nuns was due to their lack of sexual activity, which he believed led to the decay of reproductive organs, including the breast. Friedrich Hoffman of Prussia suggested that women who developed breast cancer despite regular sexual activity might be engaging in overly "vigorous" sex, causing lymphatic blockage. Other theories blamed the disease on curdled milk, pus-filled inflammations, depressive mental disorders, childlessness, and sedentary lifestyles. A significant advancement came in 1757 when French physician Henri Le Dran proposed that surgically removing the tumor, along with the lymph nodes in the armpits, could treat breast cancer. His contemporary, Claude-Nicolas Le Cat, argued that surgery was the only effective treatment, leading to the development of radical mastectomy procedures that remained the standard of care into the twentieth century.

The 19th and 20th Centuries: Evolution of Treatment

By the mid-nineteenth century, surgery had become the primary treatment for breast cancer. The development of antiseptic techniques, anesthesia, and blood transfusion made surgical interventions more survivable. William Halstead of New York revolutionized breast cancer treatment by introducing the radical mastectomy, which involved the removal of the breast, axillary lymph nodes, and chest muscles in a single procedure. This approach remained the gold standard for the next century, despite its significant physical and emotional toll on patients. In 1895, Scottish surgeon George Beatson discovered that removing the ovaries of a breast cancer patient led to a reduction in tumor size. This finding, linked to the role of estrogen in tumor growth, prompted the practice of oophorectomy in conjunction with radical mastectomy. Later, surgeons like Charles Huggins, Rolf Lefft, and Herbert Olivecrona explored further hormonal manipulations, including adrenalectomy and pituitary gland removal, to combat breast cancer. The mid-twentieth century saw a shift in understanding, with George Crile and Bernard Fisher challenging the notion that cancer was localized. Their research demonstrated that cancer could metastasize or spread throughout the body. In 1976, Fisher published findings that simpler breast-conserving surgeries, followed by radiation or chemotherapy, were as effective as radical mastectomies. This marked a

***DOI*:** https://doi.org/10.52793/JCTR.2024.4(1)-35

significant turning point in breast cancer treatment, leading to less invasive procedures and a broader range of therapeutic options. By the late twentieth century, radical mastectomy had become rare, with less than 10% of breast cancer patients undergoing the procedure by 1995. This period also saw the introduction of novel therapies, including hormone treatments, biological therapies, and the development of mammography for early cancer detection. The discovery of breast cancer-related genes, such as BRCA1, BRCA2, and ATM, further revolutionized the understanding and management of the disease.

Evolution of Treatment Options

Past Treatment Options

In the early 20th century, radical mastectomy was the standard treatment for breast cancer. This procedure, which involved the complete removal of the breast, chest muscles, and axillary lymph nodes, was developed by William Halsted and remained the gold standard until the mid-20th century. In the 1950s, hormone therapy emerged as a new treatment modality, with the discovery that removing the ovaries or administering anti-estrogen drugs could shrink tumors. This led to the development of tamoxifen, a drug that blocks estrogen receptors, which became a cornerstone of breast cancer treatment.

Present Treatment Options

Today, breast cancer treatment has become more personalized, with options including surgery, radiation therapy, chemotherapy, hormone therapy, and targeted therapy [11]. Breast-conserving surgery (lumpectomy) followed by radiation is now a common alternative to mastectomy. Advances in targeted therapies, such as trastuzumab (Herceptin) for HER2-positive breast cancer, have significantly improved survival rates [12]. Immunotherapy is also emerging as a promising treatment for certain types of breast cancer, with drugs like pembrolizumab showing efficacy in clinical trials [13].

Early Detection and Screening Programs

Early detection of breast cancer significantly improves treatment outcomes. Screening programs have been instrumental in reducing breast cancer mortality rates.

1. **Mammography:** Introduced in the 1980s, mammography has become the gold standard for breast cancer screening. It is recommended for women aged 40 and above, with annual or biennial screenings. Mammography has been shown to reduce breast cancer mortality by up to 30% in women over 50.
2. **Ultrasound and MRI:** These imaging techniques are used in conjunction with mammography, especially in women with dense breast tissue or at high risk for breast cancer.
3. **Self-Examination and Clinical Breast Examination (CBE):** Breast self-examination (BSE) and CBE are promoted as part of public health campaigns, particularly in low-resource settings where access to mammography is limited.

Newer Initiatives in South Asia

To address these challenges, several initiatives have been launched in South Asia.

***DOI*:** https://doi.org/10.52793/JCTR.2024.4(1)-35

- **India:** The National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) includes breast cancer screening and awareness campaigns. Mobile mammography units are being deployed to rural areas to improve access.
- **Pakistan:** The Shaukat Khanum Memorial Cancer Hospital & Research Centre has been instrumental in raising awareness and promoting early detection of breast cancer and provides subsidized treatment for breast cancer patients. Pakistan's Pink Ribbon Campaign has played a pivotal role in raising breast cancer awareness and has also advocated for the inclusion of breast cancer screening in national health policies.
- **Bangladesh:** The Bangladesh Breast Cancer Awareness Forum (BBCAF) conducts educational campaigns and screening camps, particularly in rural areas. The government has also initiated the National Cancer Control Strategy and Plan of Action.
- **Sri Lanka:** The National Cancer Control Programme (NCCP) has introduced breast cancer screening and awareness programs targeting women over 35. Efforts are being made to integrate breast cancer screening into primary healthcare services.
- **Afghanistan, Nepal, and Bhutan** are also developing cancer control programs, focusing on raising awareness and improving access to diagnostic services. However, political instability and limited healthcare infrastructure remain significant barriers.

Challenges in Breast Cancer Control

Breast cancer represents a multifaceted challenge in South Asia, extending beyond medical considerations to encompass socio-cultural, economic, and healthcare dimensions. This complex interplay of factors significantly impacts the diagnosis, treatment, and outcomes of breast cancer patients in these regions.

Socio-Cultural Factors

Socio-cultural beliefs and misconceptions surrounding breast cancer play a critical role in delaying diagnosis and treatment initiation among women in South Asia. Cultural taboos and stigmas often lead to a reluctance to discuss symptoms or seek medical advice. For instance, in some communities, breast cancer may be associated with shame or considered a curse, discouraging affected individuals from accessing healthcare services. Moreover, prevailing gender roles and societal norms influence healthcare-seeking behavior. Women may prioritize familial responsibilities over their own health or may lack decision-making power regarding healthcare matters, further delaying timely intervention.

Economic Challenges

Economic disparities exacerbate the breast cancer burden in these regions. Limited financial resources make accessing healthcare services, including diagnostic tests and treatments, challenging for many women. The cost of screening mammography, biopsies, and chemotherapy can be prohibitive, leading to delays in seeking medical care or incomplete treatment regimens.

Additionally, the economic impact of a breast cancer diagnosis extends beyond direct medical costs to include lost wages due to treatment-related incapacity and caregiving responsibilities. These financial burdens can push affected families into poverty, perpetuating a cycle of inequitable healthcare access.

***DOI*:** https://doi.org/10.52793/JCTR.2024.4(1)-35

Healthcare Infrastructure

The healthcare infrastructure in South Asia faces significant challenges, particularly in rural and underserved areas. The absence of population-based screening programs for breast cancer limits early detection efforts, resulting in a higher proportion of advanced-stage diagnoses. Inadequate access to diagnostic facilities, oncology specialists, and treatment centers further compounds the problem. Healthcare disparities between urban and rural areas exacerbate inequalities in breast cancer outcomes. Women living in remote regions often travel long distances to access specialized care, facing logistical and financial barriers that impact treatment adherence and outcomes.

Educational Initiatives

Effective educational initiatives are pivotal in overcoming socio-cultural barriers and improving breast cancer awareness in South Asia. Public health campaigns that promote early detection practices and debunk myths about breast cancer can empower women to seek timely medical advice. Community-based education programs tailored to local cultural contexts have shown promise in increasing knowledge about breast health and encouraging regular screening behaviors.

Painful Procedure During Treatment

Undergoing treatment for breast cancer often entails enduring painful procedures that evoke intense emotional and physical distress. For many women, chemotherapy sessions represent a grueling ordeal marked by the anticipation of debilitating side effects such as nausea, hair loss, and profound fatigue. The piercing sensation of needles penetrating tender skin during blood draws, and IV placements acts as a constant reminder of the battle against the disease. Surgical interventions, like lumpectomies or mastectomies, leave behind scars that bear witness to the invasive nature of the treatment, stirring feelings of loss, vulnerability, and altered body image. Radiation therapy, with its targeted beams aimed at eradicating cancerous cells, subject's patients to prolonged exposure in a clinical setting, further heightening anxiety and discomfort. Throughout these procedures, women often endure physical pain compounded by the emotional turmoil of confronting mortality and the uncertainty of their future.

Mental Health during Treatment

When women receive a diagnosis of breast cancer, they often undergo a profound emotional and mental journey characterized by shock, fear, and uncertainty. Initially, the news can trigger overwhelming feelings of disbelief and anxiety about the future. Many women experience sadness and grief over the impact of cancer on their lives and the potential changes they may face. Alongside these emotions, there may be anger and frustration, either towards the situation itself or the perceived injustices of the illness. Guilt and self-blame can also arise as women question if they could have prevented the cancer or worry about the burden placed on their loved ones. Coping with breast cancer can lead to feelings of isolation and loneliness as individuals navigate their personal struggles while feeling disconnected from their pre-diagnosed lives. On a mental health level, depression, anxiety disorders, and post-traumatic stress symptoms are prevalent, affecting overall well-being and daily functioning. Cognitive changes, such as "chemo brain" and sleep disturbances, further complicate the picture. Adequate support involves holistic approaches, including psychosocial interventions, education, mindfulness techniques, and medication when necessary. By addressing these emotional and mental health challenges comprehensively,

***DOI*:** https://doi.org/10.52793/JCTR.2024.4(1)-35

healthcare providers can help women with breast cancer maintain resilience, improve their quality of life, and navigate their journey with greater strength and optimism.

Results

Breast cancer is an escalating health concern in South Asia, where incidence rates are alarmingly high and continue to rise. In Pakistan, one in nine women faces a lifetime risk of being diagnosed with breast cancer, making it the most prevalent cancer among women in the country. India sees a similarly grave situation and Bangladesh, too, confronts significant challenges, with breast cancer being the leading cause of cancer-related deaths among women. These figures highlight the critical need for enhanced strategies in prevention, early detection, and treatment to curb the growing burden of breast cancer in the region. Regional disparities in healthcare access further complicate the landscape of breast cancer in South Asia. Many women, particularly those in rural and underserved areas, encounter significant financial barriers that hinder access to essential screenings and treatments. The lack of comprehensive healthcare infrastructure exacerbates these challenges, leading to delayed diagnoses and poorer prognoses compared to global standards.

Discussion

Addressing breast cancer in South Asia, particularly Bangladesh, India, and Pakistan, demands a coordinated and multi-dimensional approach that integrates cultural sensitivity, educational outreach, healthcare infrastructure development, and economic support mechanisms. This discussion explores critical strategies and challenges in mitigating the impact of breast cancer on affected communities.

Cultural Sensitivity and Educational Outreach

Cultural beliefs and societal norms significantly influence attitudes toward breast health and healthcare-seeking behaviors in Pakistan. Misconceptions and stigma surrounding breast cancer often deter women from seeking timely medical advice, resulting in late-stage diagnoses and reduced treatment efficacy. Educational initiatives are critical in dispelling myths, promoting early detection practices, and encouraging proactive health-seeking behaviors. Community-based programs designed for local cultural contexts have shown promise in increasing awareness about breast cancer and empowering women to prioritize their health. These initiatives leverage trusted community leaders and healthcare providers to deliver targeted messages and facilitate access to screening services. Education campaigns play a pivotal role in enhancing health literacy and promoting timely intervention by fostering open dialogue and addressing cultural taboos.

Healthcare Infrastructure Development

Developing robust healthcare infrastructure is fundamental to improving breast cancer outcomes in South Asia. Disparities in access to oncology services and diagnostic facilities emphasize the need for expanded healthcare facilities equipped with mammography units, pathology laboratories, and oncology treatment centers. Investments in healthcare infrastructure can facilitate early detection and ensure comprehensive cancer care across diverse geographical regions. Furthermore, integrating telemedicine and digital health technologies offers innovative solutions to overcome geographical barriers and enhance access to specialized care. Teleconsultations enable remote communities to access expert medical advice and follow-up care, improving patient outcomes and reducing treatment delays.

Economic Support Mechanisms

***DOI*:** https://doi.org/10.52793/JCTR.2024.4(1)-35

Financial barriers pose significant challenges to breast cancer care in low-resource settings like Pakistan, Afghanistan and Srilanka. The high cost of diagnostic tests, chemotherapy, and supportive care often exceeds household incomes, leading to financial hardship and treatment discontinuation. Government-led initiatives to subsidize cancer treatments and reduce out-of-pocket expenses are essential to ensure equitable access to healthcare services. Collaborative efforts between public health agencies, non-governmental organizations (NGOs), and philanthropic foundations are crucial for mobilizing resources and implementing sustainable financing mechanisms. Financial assistance programs and health insurance schemes can alleviate the financial burden on patients and families, improving adherence to treatment regimens and enhancing overall health outcomes.

Regional Collaboration and Resource Optimization

Fostering regional collaboration is paramount for optimizing healthcare resources and improving breast cancer outcomes across South Asia. Knowledge sharing, capacity-building initiatives, and joint research endeavors facilitate the exchange of best practices and clinical guidelines among neighboring countries. Collaborative efforts enable pooled procurement of essential medical supplies and promote collective advocacy for policy reforms to enhance cancer care delivery. Moreover, regional partnerships enhance the sustainability of healthcare interventions and strengthen advocacy efforts to prioritize breast cancer on national health agendas. Countries can develop tailored interventions that address unique socio-economic challenges and healthcare disparities by leveraging collective expertise and resources.

Conclusion

In conclusion, addressing breast cancer in South Asian countries requires a comprehensive approach that integrates cultural sensitivity, healthcare infrastructure development, economic support mechanisms, and regional collaboration. By implementing evidence-based strategies and fostering multi-sectoral partnerships, significant progress can be made in enhancing breast cancer prevention, early detection, and treatment outcomes. Sustainable investments in healthcare and collaborative initiatives are essential for reducing the burden of breast cancer on affected communities and improving the overall quality of life for women in the region.

References

1. Hira Sarwar is a Post Graduate Scholar, a Breast Cancer Fighter. She completed her masters' degree in International Relations from the University of Karachi. She is an editor and a foreign affairs researcher for the diplomatic newsroom World Affairs Insider. Her research areas are Foreign Policy Analysis, Public and Cultural Diplomacy, Non-traditional Security Threats, and Political Economy.
2. https://shaukatkhanum.org.pk/breast-cancer-information-guide/#What
3. https://www.who.int/newsroom/factsheets/detail/breastcancer?gad_source=1&gclid=CjwKCAjw8fu1BhBsEiwAwDrsjKwpinZMY0IKa57S03NTk9R7Kk-RcxxCpR1x33eurPUf4-OJ1ot9SxoCOiAQAvD_BwE
4. GBD 2019 Asia and All Cancers Collaborators. (2024) Temporal patterns of cancer burden in Asia, 1990–2019: A systematic examination for the Global Burden of Disease 2019 study. Lancet Reg Health Southeast Asia. 21:100333.
5. Malvia S, Bagadi SA, Dubey US, Saxena S. (2017) Epidemiology of breast cancer in Indian women. Asia Pac J Clin Oncol. 3(4):288-95.
6. Sohail, S, & Alam, S (2007) Breast cancer in Pakistan—awareness and early detection. J Coll Physicians and Surg Pak 17(12):711-2.
7. Hoq MI, Shifa S J, Mahmud MH, Hasan M M, & Jakaria M. et al (2024) Breast cancer screening awareness, practice, and perceived barriers: A community-based cross-sectional study among women in south-eastern Bangladesh. Health Sci Rep. 7(1):e1799.

***DOI*:** https://doi.org/10.52793/JCTR.2024.4(1)-35

8. Dhakal R, Noula M, Roupa Z, Yamasaki E N. (2022). A scoping review on the status of female breast cancer in Asia with a special focus on Nepal. Breast Cancer: Targets and Therapy, 14:229-46 .
9. Shayan N A, Rahimi A, Özcebe H. (2023) Cancer prevalence, incidence, and mortality rates in Afghanistan in 2020: A review study. Cancer Rep (Hoboken). 6(9):e1873.
10. https://www.news-medical.net/health/History-of-Breast-Cancer.aspx
11. https://www.who.int/newsroom/factsheets/detail/breascancer?gad_source=1&gclid=CjwKCAjw8fu1BhBsEiwAwDrsjKwpinZMY0IKa57S03NTk9R7Kk-RcxxCpR1x33eurPUf4-OJ1ot9SxoCOiAQAvD_BwE Swain S M, Shastry M, & Hamilton E. (2023) Targeting HER2-positive breast cancer: Advances and future directions. Nat Rev Drug Discov. 22(2):101–126.
12. Nathael B, Ramses R, Miguel A V, Yolanda AC. (2023) Immunotherapy in triple-negative breast cancer. J Oncology. 3(2):1102.