

## Heart disease among breast cancer patients

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### Abstract

Breast cancer survivors are becoming increasingly concerned about cardiovascular disease (CVD). However, it is still uncertain how much of a burden this comorbidity has on this group compared to the overall population and its temporal pattern. Compared to women without breast cancer, breast cancer survivors are more likely to die from CVDs, and this increased risk becomes apparent about seven years after diagnosis. To lessen the excessive burden of CVD in this vulnerable population, efforts should be made to discover risk factors and therapies that can be used in this limited time frame.

**Keywords:** Breast Cancer Survivors; Cardiovascular Disease; Competing Risks; Congestive Heart Failure; Hypertension; Stroke; Mortality; Venous Thrombosis

### 1. Introduction

The leading cause of death for both men and women in the general population, cardiovascular disease (CVD), is a significant public health concern. It is also a developing concern among cancer survivors. With 35% of non-breast cancer mortality among survivors 50 years of age and older, CVD is the leading non-cancer cause of death for breast cancer survivors. We now know very little about the causes of CVD in breast cancer survivors. Previous research, particularly concentrating on breast cancer treatment, has looked solely at-risk variables for CVD-related mortality among cohorts of cancer survivors.[1]

There have been few reports of the magnitude of this comorbidity in population-based cohorts of breast cancer survivors, despite clinical trials showing an elevated risk of CVD. Furthermore, neither the magnitude of CVD-related outcomes experienced by breast cancer survivors relative to women without breast cancer nor the timing of any increased CVD risk have been formally assessed. Due to this ambiguity, doctors are less able to accurately identify and suggest CVD risk reduction measures tailored to breast cancer survivors, particularly regarding the timing of the therapies. The primary cause of death for women overall, particularly breast cancer survivors, is cardiovascular disease. 35% of non-cancer-related deaths among breast cancer survivors aged fifty and older are caused by cardiovascular disease. Cardiovascular disease is the leading cause of death for breast cancer patients over fifty. Cardiotoxic side effects of breast cancer treatment and shared risk factors for breast cancer and cardiovascular disease are to blame for the rise

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in cardiovascular disease among breast cancer survivors. Anthracycline treatment has a known association with cardiomyopathy and congestive heart failure. Doses of anthracyclines like doxorubicin have therefore been lowered [2].

The risk of venous thrombosis increases when tamoxifen is taken as adjuvant therapy for breast cancer. This study reviewed cardiovascular disease in breast cancer survivors [3].

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## **2. Methodology**

The Rapid Review Guidebook supports the evidence-informed decision-making (EIDM) process advocated by Dr. Dobbin, comprising the following steps: The employed process was called "Steps for Conducting a Rapid Review." We located and obtained relevant research evidence, evaluated its methodological quality, and synthesized it using the health Evidence™ tool.

### **2.1. Search Strategies**

After quickly going over the research questions, these key search terms were created: "breast cancer survivors," and "cardiovascular disease."

### **2.2. The final search string is as below:**

"Cardiovascular disease" and "cancer survivors." "Four databases—Scopus, Google Scholar, PubMed, and the Cochrane Library—are employed to undertake exhaustive searches for publications. Due to the abundance of publications in the work environment and job happiness fields, Google Scholar has been added to help increase awareness of the gray literature. Scopus, PubMed, and the Cochrane Library expertly provided peer-reviewed publication coverage.

### **2.3. Eligibility criteria**

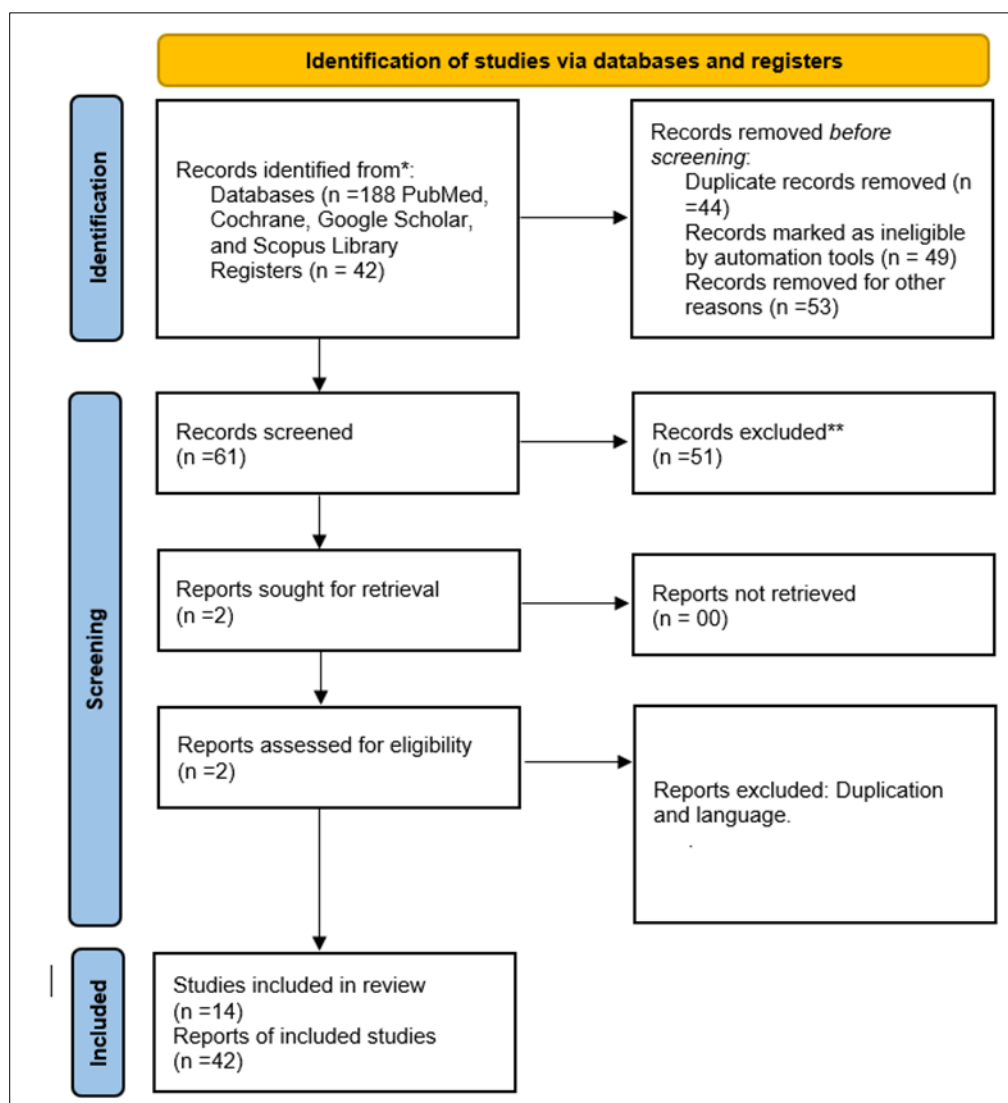
All articles, theses, and review papers dealing with "cardiovascular disease" and "cancer survivors" that were published before June 2023 are included in the literature search.

### **2.4. Data Extraction**

Two objective medical professionals reviewed the articles to ensure the selection's objectivity. In 80% of the cases, the two reviewers concurred on the final choice of articles for additional data extraction.

### **2.5. Results of the literature search**

During the initial screening stage, 188 articles were reduced to items that might be relevant. Relevant articles had to be omitted because their names, abstracts, and book chapters were written in languages other than English. Based on the inclusion criteria, 42 were found in the Preferred Reporting Items for Reviews section of the health Evidence™ tool (Figure 1). This review adhered to the Preferred Reporting Items for Reviews (PRISMA).



**Figure 1** Preferred Reporting Items for Reviews (Health Evidence™ tool) [4] (PRISMA) flow diagram of the literature screening process

### 3. Result and Discussion

Many patients in this study of breast cancer survivors being treated at a significant academic medical center in the southern United States had one or more cardiovascular risk factors. Nearly two-thirds of the women had a history of high blood pressure and excessive cholesterol. In about one in five cases, diabetes was a past issue. 44 % of the participants smoked cigarettes now or in the past [5]. Concern should be expressed about the prevalence of cardiovascular risk factors in this population because they may increase the risk of adverse cardiovascular events like congestive heart failure and stroke, as well as because breast cancer survivors already have an increased risk of such events as a result of the disease's initial treatment. Other than hypertension, stroke (5.1%), venous thrombosis (5.1%), congestive heart failure (4.4%), and cardiomyopathy (4.4%) were the most frequent unfavourable cardiovascular disease outcomes. The percentage of women who suffered a heart attack was just 1.3% [6].

Tamoxifen medication increases the risk of pulmonary embolism and deep vein thrombosis in breast cancer survivors. Congestive heart failure was more prevalent in women who had undergone chemotherapy. This is due to the documented relationship between congestive heart failure and anthracycline treatment. We lacked details regarding the individuals' particular chemotherapy regimens, however. For women with ductal carcinoma in situ or stage I disease, as well as for women with stage II cancer who are older than 80 years old, cardiovascular disease is the main cause of death.[7].

In the current investigation, more than half of the patients were over 60. Older breast cancer survivors deal with comorbidities, symptoms, physical functioning, diet, physical activity, and health complications associated with cancer treatment and aging. To evaluate therapeutic approaches for the health issues elderly breast cancer survivors are dealing with, more research is required. Cardiotoxicity is a significant risk during breast cancer treatment and could interfere with the regular chemotherapy schedule. Since there are more cancer survivors than ever, the cardiovascular side effects of chemotherapy are gradually becoming a medical issue of the utmost importance [8].

Adriamycin and trastuzumab, two common chemotherapy drugs, can cause cardiac dysfunction that treatment cessation, ACE inhibitors, and beta blockers can reverse. Anthracycline therapy for young breast cancer survivors is frequently associated with cardiac dysfunction. To avoid irreparable harm, it is crucial to identify early indications of cardiotoxicity. This can be achieved by identifying early cardiac function abnormalities instead of depending on ejection fraction, which is less sensitive to detecting subtle heart abnormalities. With the growing number of cancer survivors, monitoring diastolic function is becoming increasingly sensitive to the effects of these drugs [9].

Given the restrictions, using self-reported data raises the likelihood of misclassification bias. Electronic medical records were also used to acquire documented data on cardiovascular risk factors and unfavourable cardiovascular outcomes. It is possible that the findings from this study will not apply to other populations of breast cancer survivors. The sample, however, was heterogeneous regarding racial makeup, socioeconomic status, and prior experiences with breast cancer diagnosis and treatment. The cardiovascular risk factors and unfavourable cardiovascular events in breast cancer survivors require further research. Whether individuals with diabetes, hypertension, and high cholesterol are receiving the right treatment to lower their cardiovascular risk and avoid morbidity and mortality from unfavourable cardiovascular events are particularly concerning [10,11,12,13].

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#### 4. Conclusion

According to our review, long-term breast cancer survivors had a higher chance of dying from cardiovascular disease than women in the general population did years after diagnosis and treatment. Future, larger studies are required to corroborate our findings, pinpoint the types of CVD most prevalent in this population, and take incident CVD and CVD-related mortality into account. It will be easier to find possible targets for intervention in this high-risk population if putative mechanisms by which the CVD etiology is influenced by breast cancer survivorship experience are identified.

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#### Compliance with ethical standards

##### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

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