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Research Article

RISK FACTORS OF BREAST CANCER: LITERATURE REVIEW

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Abstract

Background: Over the last 20 years the incidence of breast cancer has increased making it the most common cancer worldwide. To carry out targeted interventions prevention depends on identifying risk factors. Comparing condensing, summarizing, and analyzing patient risk factors for breast cancer is the goal of this literature review. Methods: A literature review was conducted in 2025 from online scientific databases, such as ResearchGate, Refseek, PubMed, and Google Scholar. The search terms used were "Breast cancer", "risk factors of breast cancer", and "risk factors for breast cancer". The appropriate articles were shortlisted and selected in accordance with given criteria. Results: Possible risk factors for breast cancer are presented by research. The study supports both individual-level interventions and public health-level interventions for issues. Conclusion: The main risk factors identified in studies include age, (obesity/overweight), family history, consumption of alcohol, early age at menarche, late menopausal age, smoking, poor diet, absence of breastfeeding, low level of education, low level of breast cancer-related knowledge, radiation, oral contraception, child death in a biological mother, hypertension, history of malignancy in a first-degree relative, poor sleep, frequent multivitamin intake, hormone replacement, nulliparity, high meat intake (>=3/week), history of benign breast disease, low parity, genetic susceptibility. These findings emphasize the potential for multifactorial intervention against the occurrence of breast cancer.

Keywords: Breast cancer, Risk factors, Literature review.

INTRODUCTION

Cancer is the largest cause of mortality worldwide, with 19.3 million new cases and roughly 10 million deaths expected in 2020, underlining the need for improved prevention, detection, and treatment (Sung *et al.,* 2021). A major public health concern breast cancer is one of the most prevalent cancers among women globally. With between two and three million new cases annually breast cancer is the most common cancer diagnosis in women according to the World Health Organization (WHO 2023). In low- and middle-income nations with limited access to healthcare breast cancer continues to rank among the top causes of death despite improvements in detection and treatment rates (Sung *et al.,* 2021). Without a doubt, identifying risk factors for breast cancer will lay the groundwork for the development of effective prevention, early diagnosis, and disease burden reduction strategies (American Cancer Society, 2023). Breast cancer has a complex etiology with genetic hormonal environmental and lifestyle factors all working in concert. One of the most potent risk factors is genetic susceptibility mutations in the BRCA1 and BRCA2 genes in turn greatly raise lifetime risk (Kuchenbaecker *et al.,* in 2017). By the time they are 70 years old carriers of these genetic mutations have a 45–65% lifetime chance of getting breast cancer compared to the general populations 12 percent chance (National Cancer Institute [NCI] 2022). A womans risk of developing breast cancer is doubled if she has a first-degree relative with a history of the disease (Collaborative Group on Hormonal Factors in Breast Cancer 2019). A second general determinant of breast cancer susceptibility is hormones. Longterm exposure to endogenous estrogen has been repeatedly associated with an increased risk whether it be an earlier menarche a delayed menopause or not becoming pregnant (Travis and Key 2003).

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Hormone replacement therapy (HRT) and oral contraceptive use are examples of exogenous hormones that have been linked to increased risk over time (Chlebowski *et al.,* in 2020). Obesity after menopause increases the risk because adipose tissue produces more estrogen (PiconRuiz *et al.,* (2017). According to McTiernan *et al.,* physical activity on the other hand has been shown to have anti-inflammatory and hormonally modulating effects. (2019). There is also an environmental and lifestyle component to breast cancer susceptibility. There is strong evidence that alcohol use increases risk one drink per day increases risk by 7–10% (Seitz *et al.,* (2012). There is also evidence linking cigarette smoking to a higher risk of breast cancer especially when it begins early in life (Jones *et al.,* 2017). Environmental exposures including chemicals that disrupt hormones and radiation (e. g. A. Research in this area is still ongoing but substances like phthalates and bisphenol A may further increase risk (Rodgers *et al.,* 2018). Because of the wide variation in breast cancer risk among populations lowering incidence requires identifying and addressing modifiable risk factors. Breast cancer can be prevented in large part by public health programs that encourage healthy lifestyles routine screening and genetic counseling for high-risk individuals (American Cancer Society 2023). This literature review looks at the main riskfactors for breast cancer and summarizes the most recent research to help guide clinical and public health initiatives meant to lessen the diseases worldwide burden.

RESEARCH METHODS

Study Design: This study employed a literature review design, conducted throughout 2025. The primary objective was to synthesize current knowledge regarding the risk factors associated with breast cancer.

Data Sources and Search Strategy: Relevant articles were identified through comprehensive searches of established

scientific databases, including ResearchGate, Refseek, PubMed, and Google Scholar. The search strategy utilized the following keywords: "breast cancer," "risk factors of breast cancer," and "risk factors for breast cancer." These search terms were selected to ensure a broad and inclusive retrieval of literature pertinent to the study's aims.

Inclusion and Exclusion Criteria:

Inclusion criteria were as follows:

1. Studies involving patients diagnosed with breast cancer.
2. Research that examined interventions targeting breast cancer risk factors.
3. Articles were not restricted by methodology, study population, or study results, allowing for a comprehensive analysis of the literature.

Exclusion criteria included:

1. Studies unrelated to breast cancer risk factors.
2. Research focusing exclusively on preventive factors for breast cancer, rather than risk factors.
3. Studies that did not include patients with breast cancer.
4. Unpublished works, including conference proceedings, abstracts, case reports, theses, and dissertations, were excluded to ensure the inclusion of peer-reviewed, full-text articles only.

Data Extraction and Synthesis

To systematically extract and summarize the data from the selected articles the PICO (Population Intervention Comparison Outcome) framework was employed. The extracted data were organized into a table 1 of findings to facilitate comparison and synthesis of the findings from different studies. In order to ensure that crucial information regarding study populations interventions and outcomes was readily available for analysis this approach was chosen to increase clarity.

RESULTS

Many articles are analyzing from different scientific sites, the aricles mainly from last two decades are reviewed and selected, The following table represents this findings.

Table1. Summary of Breast Cancer Risk Factor Studies

No	Title, authors, & years of publication	Research Methodology	Research results
1	Breast cancer risk factors in Korean women (Lee et al., 2008)	Design: Systematic literature review Subjects: 34 articles Variables: Breast cancer risk factors Data Sources: MEDLINE and Korean literature databases	Identified multiple risk factors, including family history, body weight, diet, oral contraceptive use, smoking, alcohol, education, reproductive history (menarche, pregnancy, delivery, menopause, breastfeeding). Stress was not examined but suggested for future research.
2	Risk Factors of Breast Cancer in Patients(Mutriqah etal., 2024)	Design: Case control study Subjects: 27 cases& 27 controls Variable: Risk factors of breast cancer	Higher risk observed in younger women (31-40 years) with lower education (junior high school). Early menarche and limited breast cancer awareness increased risk. No significant link found between birth control pills and breast cancer.
3	Breast cancer risk factors in iranian women (Khoramdad et al., 2022)	Design: Systematic review & meta-analysis Subjects: 24 case control records Data Sources: PubMed, Scopus, Web of Science, Embase, and Iranian databases	Modifiable risks: Obesity (highest risk), smoking, late marriage, secondhand smoke, abortion, history, oral contraceptive use (weak link). Non modifiable risks: Radiation exposure (highest risk), family history, early menarche.
4	Risk factors for breastcancer in women: an update review (Fakhri etal., 2022)	Design: Review study Subjects: 15 studies Variables: Breast cancer risk factors	Significant associations found with age, smoking, obesity, menopausal status, family history, alcohol, oral contraceptives, lifestyle, and genetics.
5	Breast cancer risk factors in Iran (Shamshirian et al., 2020)	Design: Systematic review & meta-analysis Subjects: 39 studies Data Sources: PubMed, Scopus, Web of Science, Persian databases	Increased risk: Family history, hormone therapy, passive smoking, late first childbirth, abortion, highsugar intake, genetic variant. Reduced risk: Later menarche, nulliparity, breastfeeding (13-24 months), exercise, high vegetable intake.
6	Risk Factors of Breast Cancer in Hadramout Valley and Desert, Yemen (Bashamakha et al., 2019)	Design: Case control study Subject: 105 cases and 210 controls Variable: risk factors of breast cancer	Risk factors included never being married, never breastfeeding, hypertension, family cancer history, and postmenopausal status.
7	Risk factors for breast cancer (Kocic etal., 2008)	Design: Hospital-based case-control study Subjects: 120 cases & 120 controls Variables: Breast cancer risk factors	Significant risks: delayed first birth, alcohol use, second-degree family history, no breastfeeding, maternal loss in childhood.
8	Risk factors for breast cancer (Beji & Reis., 2007)	Design: hospital-based case-control study Subject: 405 cases& 1050 controls Variable: risk factors of breast cancer	Key risks: early menarche, hormone replacement therapy (HRT), alcohol use, diabetes/hypertension, oral contraceptives.

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9	Risk factors for breast cancer among women in Bhopal urban agglomerate (Lodha et al., 2011)	Design: case control study Subject:215 cases & 215 controls Variable: risk factors of breast cancer	Major risks: family history, no breastfeeding, oral contraceptive use.
10	Modifiable (Sleeping Pattern and Stress) and Non-Modifiable Risk Factors Associated with Breast Cancer (Vishwakarma et al., 2022)	Design: Case-control study Subjects: 187 cases & 187 controls Variables: Modifiable/n on-modifiable risks	Modifiable risks: Poor sleep (irregular/insuffic ient), severe stress, multivitamin use (needs further study).
11	Identifying Risk Factors of Breast Cancer Among Women Attending Selected Hospitals of Addis Ababa City (Duche et al., 2021)	Design: Case-control study Subjects: 110 cases & 110 controls Variables: Breast cancer risk factors	Risks: menopause, high BMI (>25.1 kg/m²), no breastfeeding.
12	Risk Factors for Breast Cancer Risk in Vietnam (Nguyen et al., 2016)	Design: Case-control study Subjects: 492 cases & 1,036 controls Variables: Breast cancer risk factors	Risks: fewer children, older age at first birth, higher weight/BMI at 18, higher BMI at diagnosis.
13	Risk Factors for Breast Cancer among Jordanian Women(Al Qadire et al., 2018)	Design: Case-control study Subjects: 405 cases & 418 controls Variables: Breast cancer risk factors	Calcium intake more than 3 times/week was linked to higher risk.
14	Risk factors of breast cancer in the Eastern Mediterranean Region(Namiranian et al., 2014)	Design: Systematic review & meta-analysis Subjects: 30 studies Data Sources: PubMed, Scopus, Web of Science	Risks: nulliparity, obesity (BMI >30), first pregnancy after 30, frequent red meat consumption, higher education, smoking.
15	Risk factors of breast cancer in women in Kelantan, Malaysia (Norsa'adah etal., 2005)	Design: Case-control study Subjects: 147 cases & 147 controls Variables: Breast cancer risk factors	Risks: nulliparity, overweight, family history, oral contraceptive use.
16	Breast Cancer Risk From Modifiable and Non-Modifiable Risk Factors among Women in Southeast Asia (Nindrea et al.,2017)	Design: Meta-analysis Subjects: 15 studies Data Sources: PubMed, ProQuest, EBSCO	Modifiable risks: Nulliparity (strongest), overweight, oral contraceptives. N on-modifiable risks: Family history (strongest), age ≥40, menopause.
17	Analysis of risk factors associated with breast cancer in women (Liu H et al., 2022)	Design: Systematic review & meta-analysis Data Sources: Chinese/intern ational databases, registries	Strongest risk: Family history. Other risks: late menopause (>50), oral contraceptives (weak link), benign breast disease (non significant)

DISCUSSION

The risk factors for breast cancer in this review show notable global variation with different patterns seen in different ethnic groups and a steady increase in incidence over time. The frequency of breast trauma public awareness genetic predisposition and the effectiveness of immune surveillance are some of the contributing factors that have an impact on this heterogeneity. Breast cancer is still a major public health concern coming in second only to lung cancer in 2022 in terms of diagnosis and fourth globally in terms of cancer-related deaths (Bray *et al.,* in 2024. The growing occurrence, and prevalence of breast cancer is due to increased in risk factors mainly modifiable risk factors and therefore consistent with study carried out by Britt etal.,2020, who was abstracted that reducing incidence of breast cancer will likely require both pathways, the first is a precision-preventing model of identifying women at elevated risk and labeling them for certain interventions, such as risk-reducing treatment and the second is a population-level approach of reducing exposure to modifiable risk factors. The breast itself is a soft organ exposed to the external environment, particularly in women. Due to its increased sensitivity compared to other internal organs, it is more susceptible to the influence of lifestyle and demographic factors. Consequently, the breast tissue undergoes gradual degeneration over time, increasing the risk of cancer development.

Conclusion

The main factors identified in studies include age, (obesity/overweight), family history, consumption of alcohol, early age at menarche, late menopausal age, smoking, poor diet, absence of breastfeeding, low level of education, oral contraception, low level of breast cancer-related knowledge, radiation, child death in a biological mother, hypertension, history of malignancy in a first-degree relative, poor sleep, frequent multivitamin intake, hormone replacement, nulliparity, high meat intake (>=3/week), history of benign breast disease, low parity, genetic susceptibility. These findings emphasize the potential for multifactorial intervention against the occurrence of breast cancer.

Limitations

As with all literature reviews, this review is subject to limitations related to publication bias and the potential omission of relevant studies not indexed in the selected databases or published in languages other than English. These limitations were considered during the synthesis and interpretation of the findings.

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