Influence of Socioeconomic Status on Breast Cancer Treatment in the US: Preliminary Results from a Systematic Literature Review

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Background and Objective

- Existing research has identified substantial disparities in breast cancer treatment and survival based on socioeconomic status (SES). However, the specific impact and mechanisms underlying SES on treatment utilization across patient demographics remain poorly understood.

- The objective of our review was to examine the association of SES with the receipt, treatment delays, and adherence to breast cancer treatment (curative, adjuvant, and maintenance) among US women aged 18 years and older.
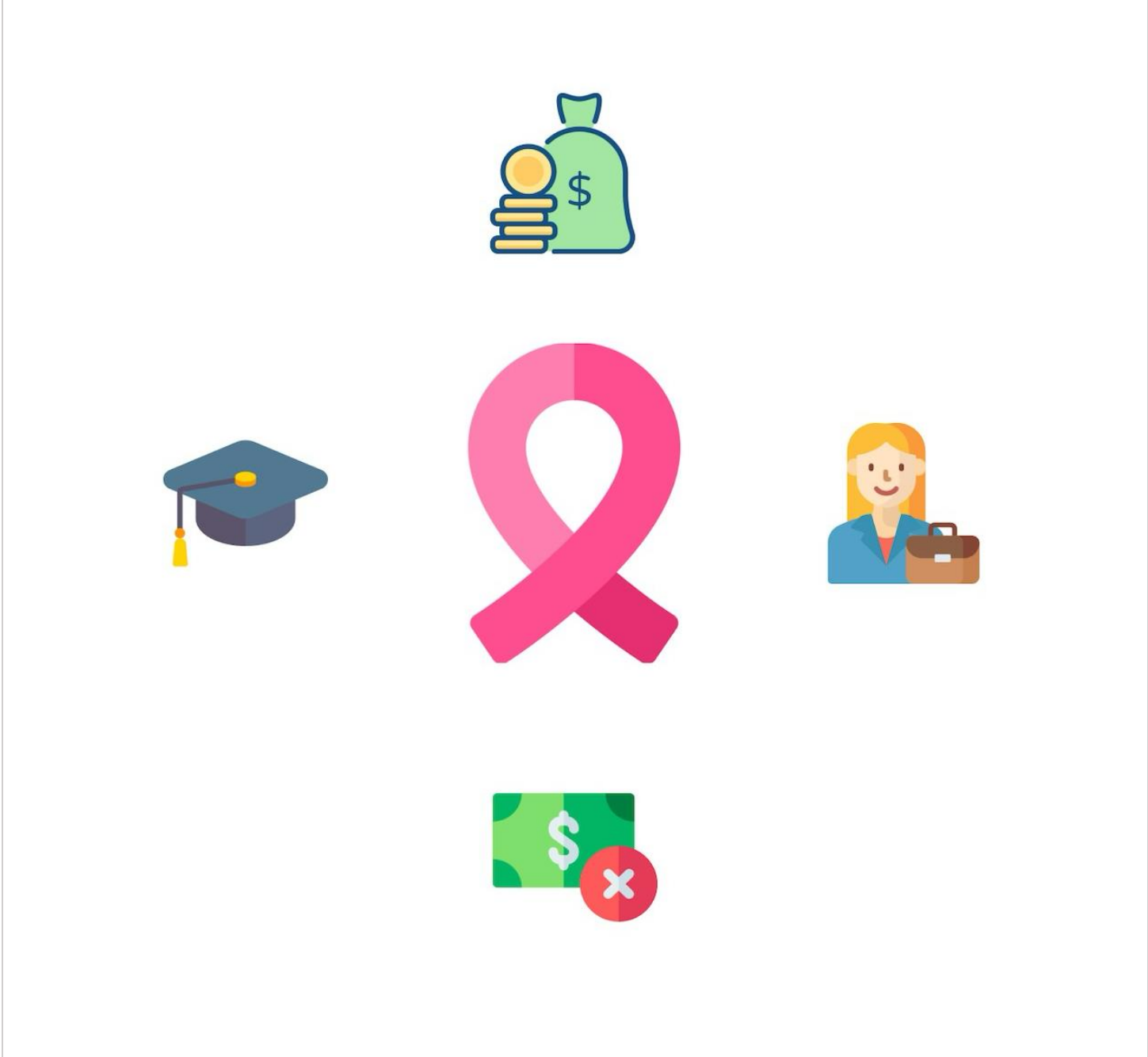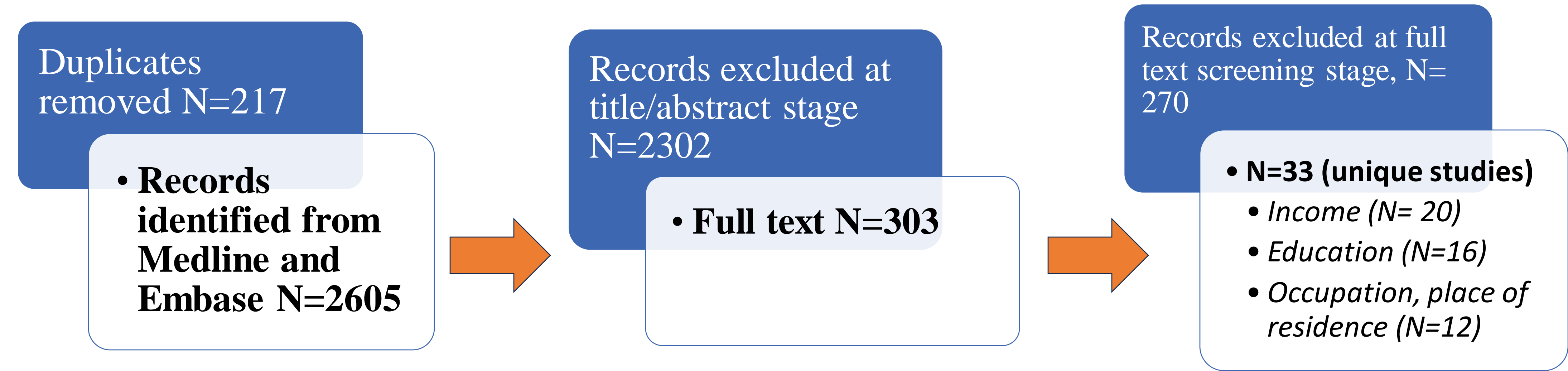
Methodology

- An electronic search was conducted using Medline® and Embase® from inception to 10th November 2023 to identify studies reporting socioeconomic disparities.

- Two independent reviewers evaluated each article at each stage of the screening process.

- *Inclusion criteria*: Studies that investigate the influence of SES on breast cancer treatment outcomes among women (>18 years) with stage I-III breast cancer in the US; No restrictions on study design.

- *Exclusion criteria*: Stage IV breast cancer or other types of cancer, studies outside US, reviews, editorials, commentary, and studies not published in English.

- **Search Terms:** 'socioeconomic factor,' 'breast or mammary,' 'cancer or carcinoma,' 'tumor.'

Results

- A total of 33 studies met the inclusion/exclusion criteria out of the 2605.

Duplicates removed N=217
- **Records identified from Medline and Embase N=2605**

Records excluded at title/abstract stage N=2302
- **Full text N=303**

Records excluded at full text screening stage, N= 270
- N=33 (unique studies)
  - *Income (N= 20)*
  - *Education (N=16)*
  - *Occupation, place of residence (N=12)*

- Income was a significant predictor of breast cancer survival (RR = 1.46; 95% CI = 1.23,1.69). Women with an income < $50,000 were 2.4 times more likely to report discontinuing use than women with an income of $50,000 or more (OR=2.42; 95% CI=1.32-4.41).

- Low education level was associated with poor medication adherence to breast cancer therapy (p=0.025).

Results

Methodological Characteristics of the Key Studies

Author/Year	Study Design/ Sample	Data Sources	Key findings
Alderman 2011	Cross-sectional; N=20032	MEDPAR, Medicare 2003-2004, AMA	78.2% of patients in the lowest SES quintile received BCT, compared with 86.3% of those in the highest quintile (OR, 0.60; 95% CI, 0.52-0.68)
Ali 2014	Retrospective cohort; N=33706	Florida cancer data system 1997-2002	Women who resided in census tracts with higher percentages of individuals with at least a high school education were found to be significantly associated with higher odds of receiving RT after BCS
Bhutiani et 2020	Retrospective cohort; N=6225	Kentucky cancer registry	Delay in postoperative chemotherapy (>60 days from surgery to chemotherapy) was associated with low education level (OR = 1.324, 95% CI = 1.164–1.506, p< .001)
Fappiano 2021	Retrospective cohort; N= 1192294	US National cancer database 2004-2016	Lower income (< $30,000), lower education (not having a high school degree) associated with lack of receipt of surgery
Buszek 2019	Retrospective cohort; N=2995	National cancer database 2010-2014	Living in a metropolitan (vs urban) area (HR 3.09; 95% CI 1.43-6.67; P = .004) were associated with inferior overall survival
Byun 2016	Retrospective cohort	National cancer database 2004-2013	Factors associated with patients undergoing mastectomy were high levels of education (p<0.01) and facility location
Caprio 2012	Cross-sectional , N=387	National Health interview survey 2010	Factors associated with receiving no treatment included education (p=0.003), region of residence (p=0.031)
Chervu 2023	Retrospective cohort, N-1079057	National cancer database 2004-2015	Being in the lowest (aOR 0.95) and second lowest (aOR 0.98, all p< .05) income quartiles were associated with reduced odds of undergoing BCT.
Dankwa-Mullan 2021	Cross-sectional retrospective, N=53060	IBM MarketScan Commercial Claims and Encounter and Medicare Supplemental	Communities with a higher median household income (per $10,000) had an increased likelihood of BCS (OR: 1.04, 95% CI 1.00 to 1.09; p = 0.04).
Dreyer 2018	Retrospective cohort, N=11368	SEER Medicare	Poor women were less likely than near-poor or high SES women to receive any axillary surgery and adjuvant chemotherapy. Poor and near-poor women were less likely than high SES women to receive sentinel lymph node biopsy and radiation after BCS (p<0.05)
Hedin 2011	Longitudinal, N=3083	Medicare	Household income was one of the reasons for non-persistence to therapy (p=0.045). High income subjects were less likely to discontinue therapy (p=0.04)
Jagsi 2010	Cross-sectional, N=2260	Survey+SEER	Income (p= .03) significantly associated with likelihood of RT receipt (> 20000 vs <$20000).
Neuner 2019	Cross sectional survey, retrospective, N=1235	Survey+hospital based cancer registry	Receipt of neoadjuvant therapy was lower for those with income <$100,000 (aOR 0.56, 95% CI 0.2–0.9). Only 18.2% of those with a high school education or less received neoadjuvant chemotherapy, vs 32.7% of those with at least some college.
Sura 2015	Retrospective cohort, N=8620	SEER 2000-2011	Patients with at least a high school degree were more likely to receive RT (p < 0.0001) and having a bachelor's degree increased probability of accelerated partial breast irradiation (p< 0.013). The median family income was higher in those receiving RT ($73,770 v $72,830, p< 0.037).
Tiley 2021	Cross-sectional, N=32	Survey	Low education level was associated with poor medication adherence to endocrine-based breast cancer therapy (p=0.025)

- Women with lower SES are less likely to participate in regular screening resulting in late-stage diagnosis and treatment; knowledge and financial barriers among women of low SES influence treatment decisions; psychosocial stressors associated with economic instability can impact treatment adherence and outcomes; women with lower SES often face transportation and geographic barriers.

Conclusion

Healthcare interventions and policies focusing on equitable access to quality care tailored to all women, regardless of their socioeconomic background, help improve breast cancer outcomes for the various demographics in the US.

References

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