

Healthcare Costs Associated with Depression Among Patients Diagnosed with Estrogen Receptor Positive (ER+) Breast Cancer: Mitigation Through Adherence to Anti-Depressant Medication

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Background

- The 5-year survival rate for breast cancer is 90.8%, though comorbid psychiatric conditions such as anxiety and depression remain common within this population.^{1,2}
- Estrogen depletion has been shown to be associated with depression, and breast cancer patients prescribed estrogen depletion therapy may need pharmacotherapy to manage their depression.^{3,4}
- Patients with depression and anxiety have been shown to incur significantly increased healthcare resource utilization and costs compared patients without these comorbidities.²
- However, there is a paucity of research examining antidepressant adherence and its impact on healthcare cost among patients with breast cancer.

Objective

- To examine the effect of antidepressant treatment and adherence on subsequent healthcare expenditure among women with newly diagnosed ER+ breast cancer and comorbid depression.

Methods

Data Source

- The Inovalon MORE² closed claims database spanning 1/1/2014 – 9/30/2022 was used for the current study.
- The Inovalon MORE² closed claims database is a primary-sourced medical and pharmacy claims database consisting of over 160 health plans and covering all major U.S. payer lines of business including Commercial (31% of market), Medicare Advantage (29% of market), and Managed Medicaid (89% of market).

Sample

- The study sample was comprised of adult women (aged 18+ years) who were newly diagnosed with ER+ breast cancer between 1/1/2014 and 9/30/2022 via the presence of ≥ 1 inpatient claim or ≥ 2 outpatient claims (30-days -365 days apart) with an appropriate ICD-9-CM or ICD-10-CM subcode for ER+ disease, or the presence of a relevant lab value. The date of the earliest breast cancer claim was set as the index date, and all patients were required to present 12-months of continuous enrollment preceding and following the index date. Patients with a diagnosis of depression prior to the index date, another cancer diagnosis anytime during the study period, and evidence of any breast cancer treatment prior to index date were excluded.
- Patients were categorized based on depression status during the follow-up period (yes vs. no). Patients with a depression diagnosis receiving antidepressant medication during the follow-up period were further categorized by adherence status to antidepressants using the proportion of days covered (PDC):
 - Adherent: PDC ≥ 0.80
 - Non-adherent: PDC < 0.80

Analysis

- Demographic characteristics were assessed on the index date, while the Elixhauser Comorbidity Index (ECI) and total healthcare costs were assessed during the 12-month period preceding the index date.
- Healthcare costs were also assessed during the 12-month post-index period and reported overall and by specific place of service category.
- Statistically significant differences in outcomes between depression cohorts (yes vs no) and antidepressant adherence cohorts (yes vs no) were assessed using independent t-tests for continuous variables, and chi-squares tests of equality of proportions for categorical variables.
- A generalized linear regression model with a log-link and gamma distribution was built to assess the association of depression and antidepressant adherence on total healthcare costs.

Significantly lower annual healthcare costs were observed among patients with ER+ breast cancer with comorbid depression who were adherent to antidepressant therapy.

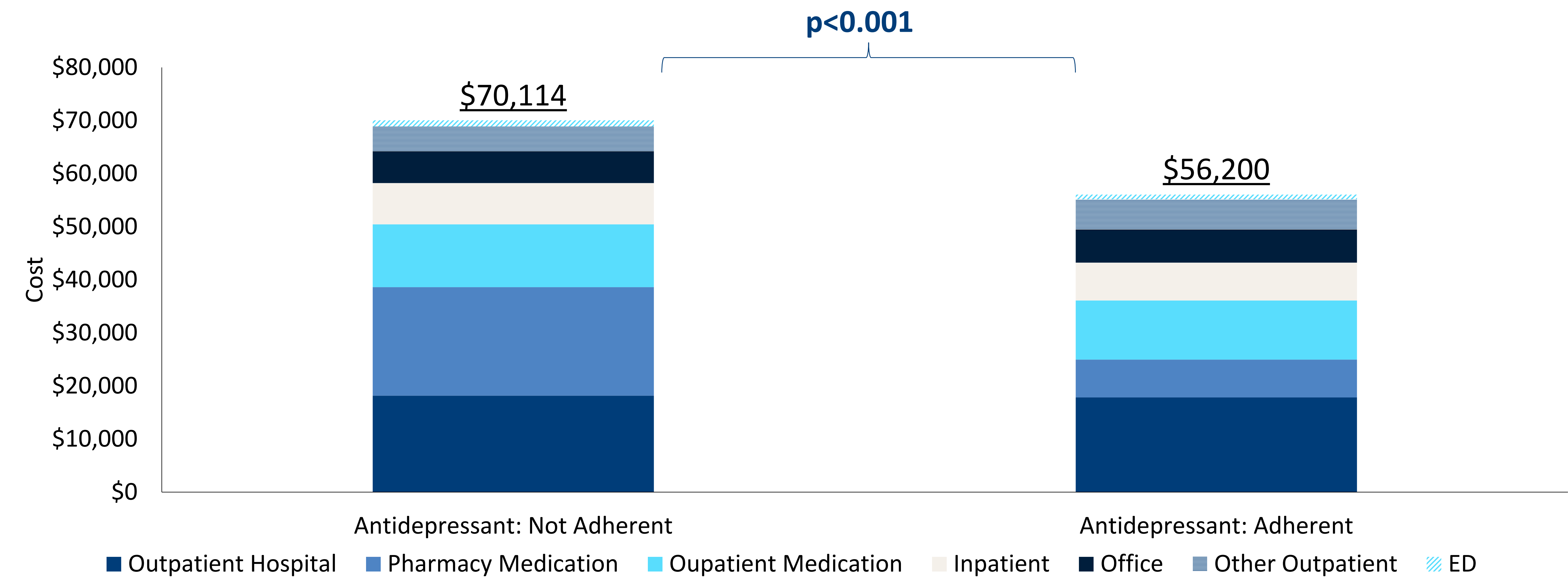


Table 1. Patient Characteristics: Depression Status

	Depression N= 10,472	No Depression N= 72,569	P-value
Age, mean (SD)	56.2 (12.0)	58.5 (11.8)	<0.0001
Antidepressant Use, n (%)	7,038 (67.2%)	15,807 (21.8%)	<0.0001
ECI Score, mean (SD)	1.0 (3.9)	0.9 (3.6)	0.3338
Baseline Total Cost, mean (SD)	\$12,035 (\$187,100)	\$8,029 (\$23,828)	0.0287

Figure 2. Unadjusted 12-Month Healthcare Cost

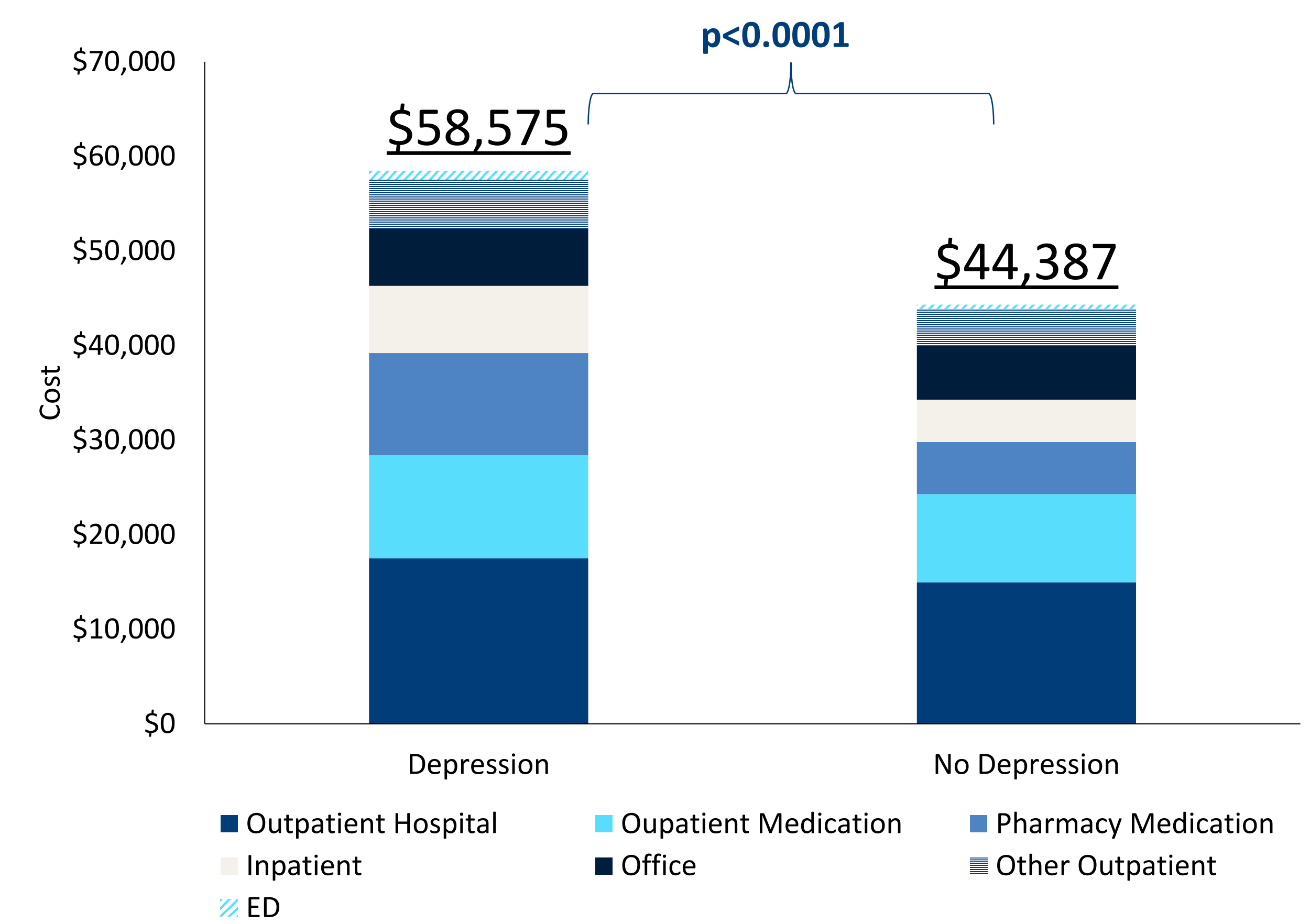
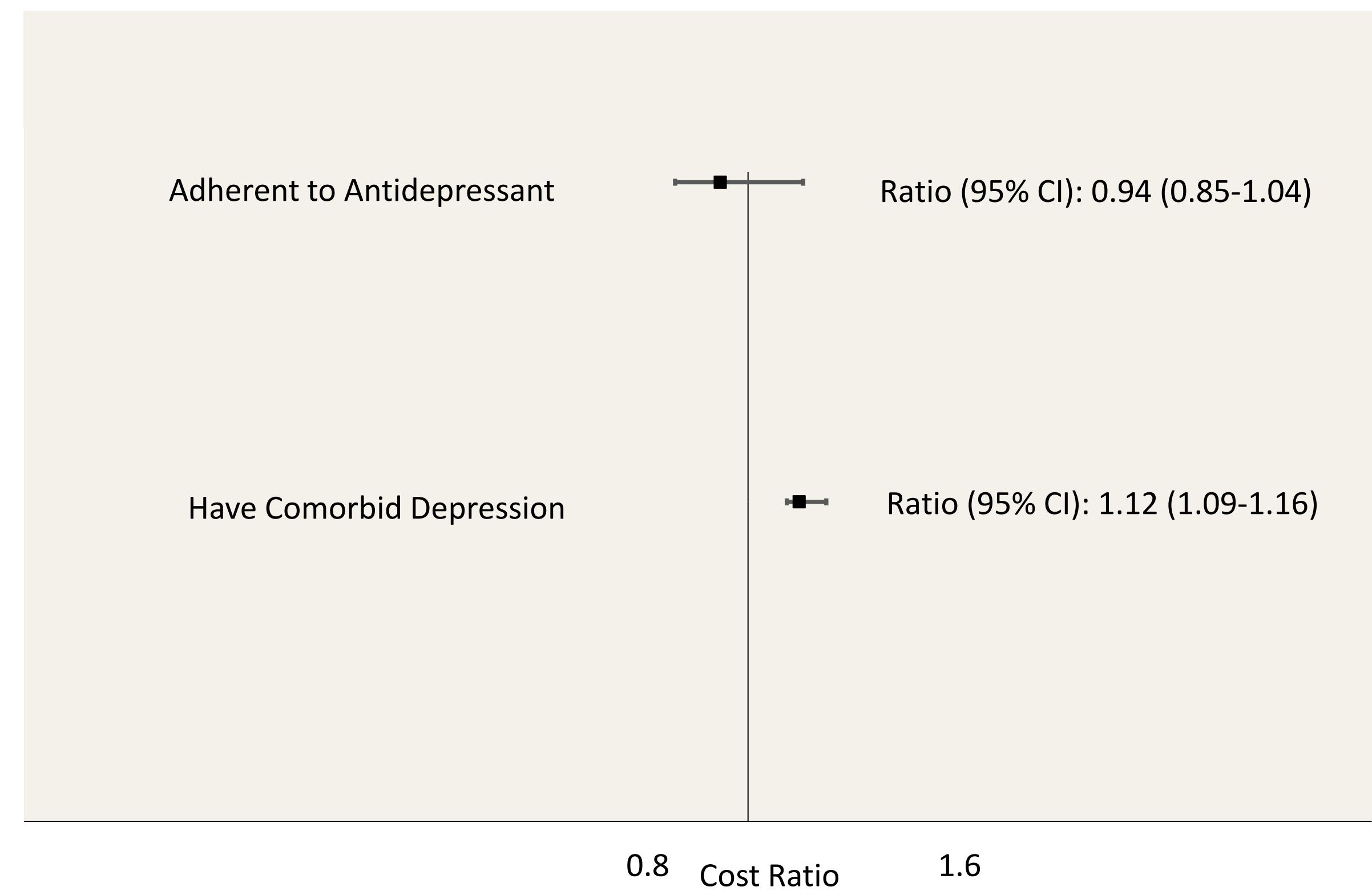


Table 2. Patient Characteristics: Antidepressant Adherence Status

	Adherent N= 4,296	Not Adherent N= 2,742	P-value
Age, mean (SD)	56.2 (11.0)	53.7 (11.6)	<0.0001
ECI Score, mean (SD)	0.9 (3.8)	0.8 (3.8)	0.0049
Baseline Total Cost, mean (SD)	\$13,158 (\$179,494)	\$8,768 (\$14,185)	0.026

Figure 3. Adjusted 12-Month Healthcare Cost



Results

Depression Status

- A total of 83,041 patients qualified for the study, with 12.6% presenting comorbid depression during the 12-month post-index period. Antidepressant use was observed in 67.2% of patients with comorbid depression versus 21.8% among those without comorbid depression; $p < 0.0001$ (**Table 1**).
- Patients with comorbid depression were younger and incurred significantly higher total baseline healthcare costs compared to patients without comorbid depression ($p < 0.05$; **Table 1**), and also incurred significantly higher post-index costs compared to patients without comorbid depression ($p < 0.0001$; **Figure 2**).
- Following adjustment for patient characteristics and baseline costs with a multivariable model, patients with comorbid depression incurred 12% higher post-index costs compared to patients without comorbid depression; $p < 0.05$ (**Figure 3**).
- Antidepressant Adherence Status
- Patients with comorbid depression who were adherent to their antidepressant treatment regimen were older and incurred significantly higher baseline costs compared to patients who were not adherent to their antidepressant regimen ($p < 0.05$; **Table 2**).
- Patients with comorbid depression who were adherent to their antidepressant regimen incurred significantly lower post-index costs than patients who were not adherent to their antidepressant regimen (\$56,200 vs \$70,114; $p < 0.01$; **primary graphic**).
- Following adjustment for patient characteristics and baseline costs with a multivariable model, patients with comorbid depression who were adherent to an antidepressant incurred 6% lower post-index costs compared to patients who were non-adherent to an antidepressant regimen (**Figure 2**).

Conclusions

- A new diagnosis of comorbid depression was associated with significantly increased healthcare costs among women with an ER+ breast cancer diagnosis in the year following the initial diagnosis.
- Among patients with a comorbid depression diagnosis receiving treatment with an antidepressant, a possible economic benefit of antidepressant treatment adherence was observed, as adherent patients incurred lower costs compared to patients' non-adherent to antidepressant therapy, despite incurring the added treatment costs of continued therapy. .
- Further work is needed to determine if there is a significant economic benefit to receiving and adhering to antidepressants among breast cancer patients with comorbid depression.

Limitations

- The determination of breast cancer and depression in the present study relied on the presence of diagnosis codes within administrative claims data, which may be subject to coding errors. Additionally, disease severity (i.e. cancer stage, depression scores) are not captured in administrative claims.
- Antidepressant use was based on prescriptions filled, though it is infeasible to determine if patients took their medication as prescribed.
- Adherence to antidepressants was based on the utilization of any antidepressant, regardless if patients switched specific treatment agents.

References

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