

Nastaran Nemati¹, Tolulope Oladele¹, Ensieh Shahrjooihaghighi², Jayani Jayawardhana¹

¹Health Management and Policy, College of Public Health, University of Kentucky | ²Kinesiology and Health Promotion, University of Kentucky

BACKGROUND

- Breast cancer survivorship is increasing in the United States, leading to a growing population with ongoing healthcare needs.
- Survivors often experience long-term physical and functional challenges that require continued care.
- Out-of-Pocket (OOP) healthcare costs** (e.g., copayments, deductibles, non-covered services) can contribute to financial burden and reduced quality of life.
- Physical Activity (PA)** is a modifiable behavior that improves functional status, reduces comorbidities, and supports overall health.
- PA may reduce healthcare utilization and patient-level financial burden

OBJECTIVE

To evaluate whether adherence to recommended physical activity guidelines is associated with lower annual out-of-pocket healthcare expenditures among U.S. breast cancer survivors.

DATA AND SAMPLE

- Database:** MEPS 2017-2023
- Target Population:** Women ≥18 with breast cancer
- Sample Size:** 2,796
- Exposure:** PA guideline adherence (PA: ≥30 min activity ≥5 days/week)
- Outcome:** annual OOP costs (log-transformed)

METHODS

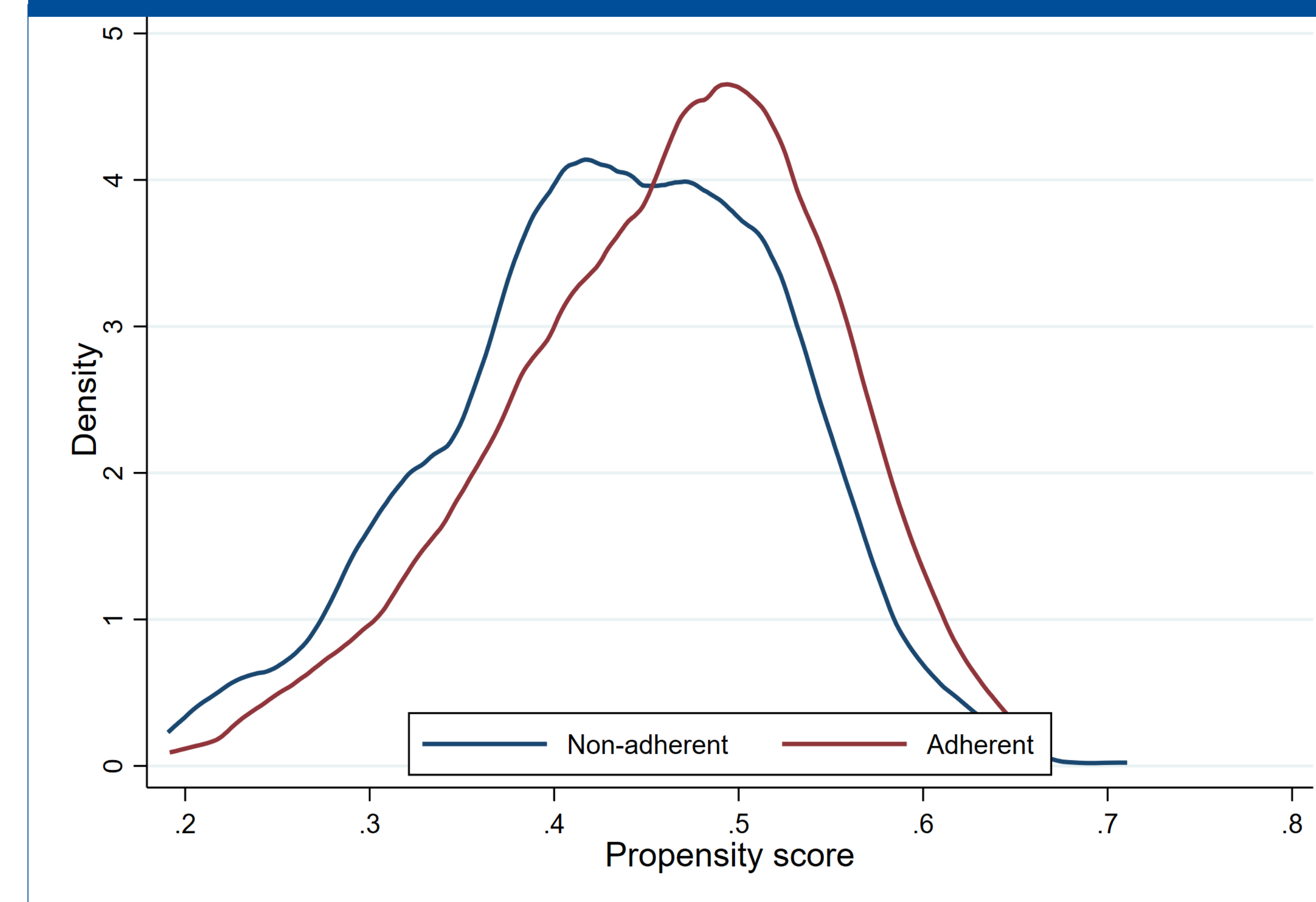
- Used Inverse Probability of Treatment Weighting (IPTW) to create comparable groups
- Compared active vs inactive groups physically
- Adjusted for age, education, income, insurance, race, region, comorbidities (including hypertension, cardiovascular disease, stroke, diabetes, emphysema, asthma, and arthritis)
- Weights combined with survey weights; trimmed
- Sensitivity analyses were performed to test robustness

TABLE 1. SELECTED CHARACTERISTICS

Characteristic	PA Adherent (1212)	Non-Adherent (1584)
College or above	63.4%	55.8%
Married	49.4%	42.3%
Medicaid	10.3%	15.1%
Private insurance	25.4%	21.7%
Low income	16.9%	23.6%
≥2 chronic diseases	43.9%	53.7%

Non-adherent women had more chronic conditions and lower income

FIGURE 1. DISTRIBUTION OF PROPENSITY SCORES



The overlap in propensity scores supports the common-support assumption for inverse probability of treatment weighting.

TABLE 2. ADJUSTED RESULTS (MAIN ANALYSIS)

Measure	Before weighting	After weighting
Typical standardized mean difference	Up to 0.20	<0.02

Before weighting: groups differed on several baseline characteristics
After weighting: all standardized mean differences were <0.10
Weighting created more comparable groups for analysis

Estimated Annual Out-of-Pocket Healthcare Expenditures

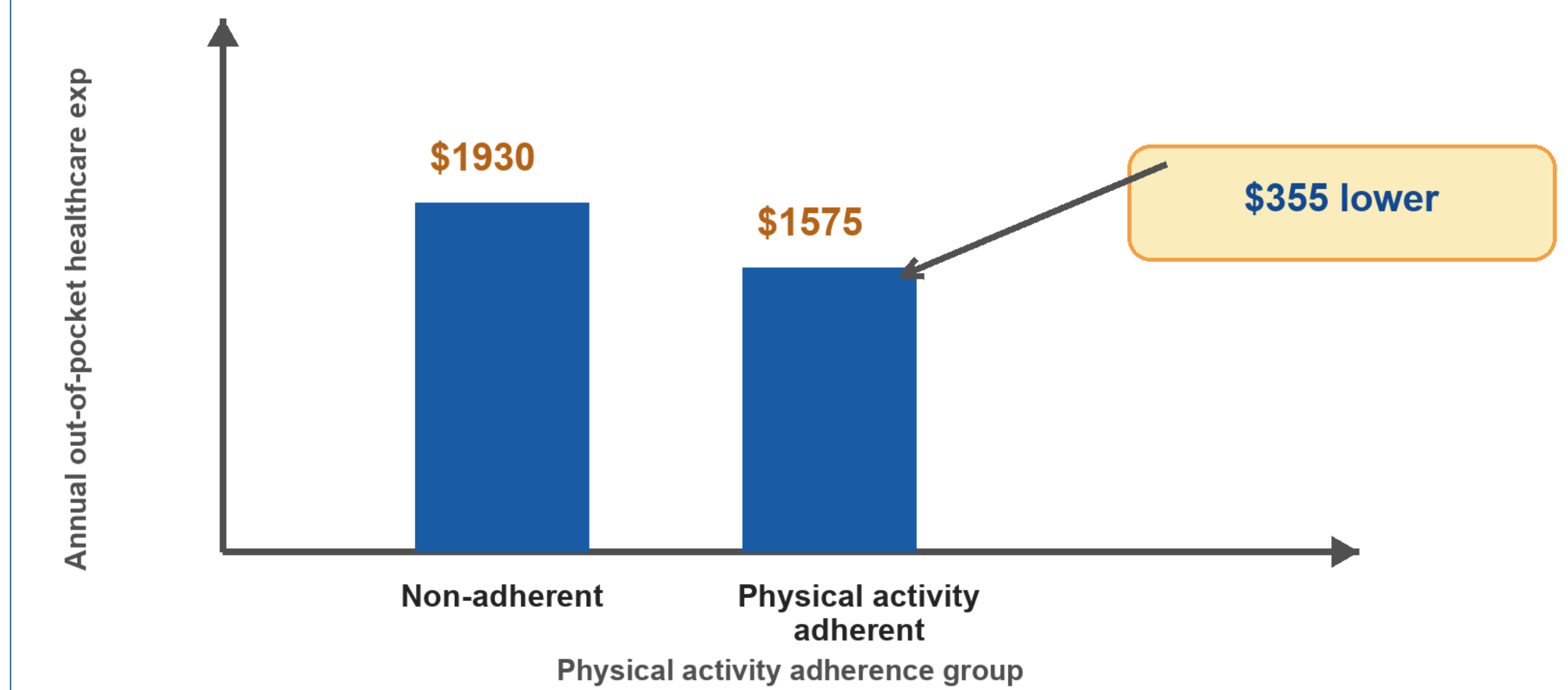


TABLE 3. SENSITIVITY ANALYSES SUPPORT THE MAIN FINDING

Model	Result	P-value
Survey-weighted regression	19.3% lower	0.012
IPTW without trimming	19.1% lower	0.037
IPTW with trimming	17.5% lower	0.056
Doubly robust model (AIPW)	13.3% lower	0.044

Results were consistent across multiple models. Across different statistical models, physically active women consistently had lower out-of-pocket costs, with reductions ranging between 13% and 19%. AIPW = augmented inverse probability weighting.

CONCLUSION

- Women who met physical activity (PA) guidelines had **~18% lower annual out-of-pocket (OOP) costs**
- Findings were consistent across models
- Promoting PA may be a simple, low-cost strategy to reduce the financial burden of breast cancer survivorship

LIMITATIONS

- Self-reported PA.
- Cross-sectional design.
- No cancer stage/treatment data.