

WEIGHT TRENDS AND PREDICTORS OF WEIGHT GAIN IN BREAST CANCER SURVIVORS



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BACKGROUND

- Breast cancer (BC) is the most common cancer in women.
- Weight gain after treatment for early-stage BC is associated with a higher risk of recurrence.
- Excess adiposity is also a major risk factor for cardiovascular disease, the leading cause of non-BC related death in BC survivors.
- This study aimed to describe weight trends in a large cohort of BC survivors and to identify predictors of weight gain after BC diagnosis.

METHODS

- This is a retrospective study of BC survivors from the prospectively consented Mayo Clinic Breast Cancer Registry, which has enrolled >10,000 patients that have been seen at least once at the Mayo Clinic in Rochester, MN for a breast cancer diagnosed within the prior year.
- We extracted data on weights at 1 year before BC diagnosis (baseline weight), and years 1, 4, and 6 after BC diagnosis to assess weight trends.
- To better understand weight trends in BC survivors, we compared them to a group of age-matched women without a history of any cancer or bariatric surgery from the Rochester Epidemiology database.
- We identified BC survivors with weight gain >10% from baseline weight at years 1, 4, and 6. We then conducted univariable and multivariate logistic regression analyses to identify predictors of >10% weight gain (Data presented for 6 years only).
- Variables considered included: demographics, anthropometrics, BC clinical and pathologic characteristics, BRCA 1 and 2 genetic mutation status, and treatment.

RESULTS

Table 1. Baseline Characteristics

	BC Survivors N= 4575	Controls N= 4575	p
Age, years (SD)	58.1 (12.7) ¹	58.1 (12.6)	0.95
Baseline weight, Kg (SD)	76.1 (17.7) ¹	74.8 (14.9)	0.12
BMI, kg/m ²	27.7 (6.2)¹	28.3 (5.6)	<0.001
Race, White	4370 (95%)	3902 (85%)	<0.001

¹ At breast cancer diagnosis

Breast Cancer Characteristics

Menopausal Status (n = 3686)

Postmenopausal	2529 (69%)
Premenopausal	1127 (31%)

Clinical Overall Stage (n = 3455)

Stage 0	507 (15.4%)
Stage I	1490 (45.2%)
Stage II	990 (30.0%)
Stage III	308 (9.3%)

Breast Cancer Laterality and Diameter (n = 4449)

Unilateral	4240 (92.7%)
Bilateral	126 (2.7%)
Breast Tumor Diameter, cm	1.8 (2.6)

Hormone Receptor Positivity

ER+, Yes (n = 4575)	2682 (85.0%)
PR+, Yes (n = 3255)	2416 (77.0%)

Pathogenic Genetic Mutations

BRCA1, Yes	58 (1.3%)
BRCA2, Yes	47 (1.0%)

Surgical Treatment

Breast Preserving Surgery	2358 (51.5%)
Non-Breast Preserving Surgery	1984 (43.4%)
Unilateral/Bilateral Mastectomy	51%/49%

Radiotherapy

Radiotherapy, yes	1328 (29.0%)
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Systemic Treatment

Systemic Treatment, Yes	3298 (72.1%)
Chemotherapy, Yes	581 (17.5%)
Targeted Systemic Therapy, Yes	279 (8.4%)

Endocrine Therapy, yes

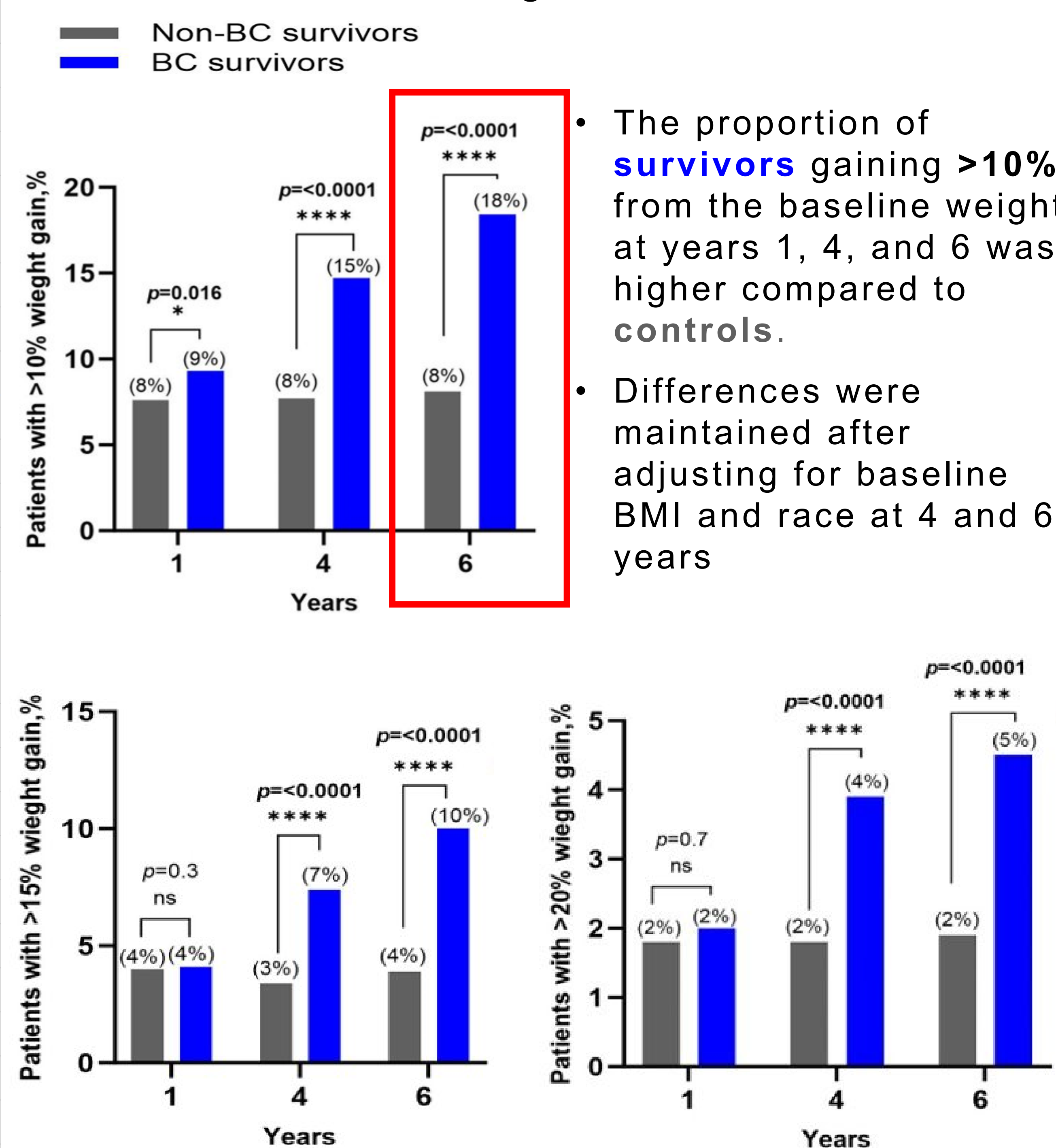
2794 (61.1%)	
Aromatase Inhibitors, yes	1900 (41.5%)
SERM, Yes	1338 (29.2%)
Medical Ovarian Supp, Yes	206 (4.5%)
Surgical Ovarian Supp, Yes	297 (6.5%)

Table 2. Weight Trends in Survivors and Controls

Weight Change %	BC Survivors	Controls	p
Δ from baseline to year 1	+0.1 ± 9%	+0.7 ± 8 %*	0.015
Δ from baseline to year 4	+1.2 ± 11%*	+0.8 ± 9%*	0.02
Δ from baseline to year 6	+1.6 ± 12%*	+0.7 ± 8 %*	0.0008

* Significant difference from baseline, i.e. p<0.05

Figure 1: Proportion of BC survivors and controls gaining >10, >15 and >20% of baseline weight



- The proportion of **survivors** gaining >10% from the baseline weight at years 1, 4, and 6 was higher compared to **controls**.
- Differences were maintained after adjusting for baseline BMI and race at 4 and 6 years

- We observed the same trend for weight gain of >15%, and >20% from baseline weight.

RESULTS

Table 3. Unadjusted Univariate Analyses for >10% Weight Gain

	Year 6	
	OR [95% CI]	p
Demographic variables		
Age at breast cancer diagnosis, 10 years	0.5 [0.4, 0.6]	<.0001
Baseline weight, 10 kgs	0.8 [0.7, 0.9]	<.0001
BMI, kg/m ²	0.94 [0.92, 0.96]	<.0001
Race, White vs non-white	1.3 [0.6, 2.9]	0.5
Ethnicity, Non-Hispanic vs Hispanic	0.7 [0.2, 2.1]	0.5
Menopause Status		
Menopause Status, post vs pre	0.2 [0.1, 0.3]	<.0001
BC Clinical Characteristics		
Stage I vs II and III	0.6 [0.4, 0.7]	<.0001
BRCA1, Yes vs no	2.2 [0.9, 5.6]	0.1
BRCA2, Yes vs no	4.2 [1.9, 9.3]	0.0007
Pathologic Characteristics		
Tumor Diameter, cm	1.0 [0.97, 1.04]	0.69
ER+ and PR+, Yes vs no	0.7 [0.5, 0.9]	0.02
Treatment		
Breast Preserving, Yes vs no	0.7 [0.6, 0.9]	0.002
Radiotherapy Treatment, Yes vs no	1.02 [0.80, 1.30]	0.8
Systemic Treatment, Yes vs no	1.8 [1.3, 2.4]	0.0001
Chemotherapy, Yes vs no	1.7 [1.3, 2.1]	<.0001
Targeted Therapy, Yes vs no	1.57 [1.15, 2.14]	0.04
Endocrine Therapy, Yes vs no	1.3 [1.0, 1.7]	0.02
Aromatase Inhibitors, Yes vs no	0.96 [0.8, 1.2]	0.73
SERM, Yes vs no	1.7 [1.3, 2.1]	<.0001
Medical Ovarian Supp, Yes vs no	2.8 [1.8, 4.4]	<.0001
Surgical Ovarian Supp, Yes vs no	2.4 [1.7, 3.3]	<.0001

- The same trends were observed for years 1 and 4. Notably, after adjusting for age or menopause status and weight or BMI, only more advanced stage, BRCA 2 mutation, and the use of systemic therapy were independently associated with >10% weight gain.
- In all these models, age, menopause status, weight and BMI remained the strongest risk factors for >10% weight gain.

CONCLUSION

- While most BC survivors do not experience weight gain after survivorship, 1 out of 5 may experience excessive weight gain of more than 10%.
- Younger age, premenopausal status, and lower weight and BMI at BC diagnosis were the strongest predictors of weight gain during BC survivorship, followed by having a BRCA 2 mutation, more advanced stage, and receiving systemic therapy.