Evaluating the use, self-reported outcomes, and cost of using scalp cooling in a prospective survey study of young women with early-stage breast cancer

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Background

- Hair loss is a significant quality of life issue for women with breast cancer and may be particularly distressing for young women.[1]
- Scalp cooling is effective at preventing chemotherapy-induced alopecia, and studies suggest improved quality of life in patients who have undergone successful scalp cooling treatment. However, scalp cooling is rarely covered by insurance.[2]
- We aimed to understand how young women navigate the decision to use scalp cooling during chemotherapy, and self-reported estimates of hair loss, hair recovery, and cost at 1-year follow-up.

Methods

- Single-institution prospective registry of young women diagnosed with early breast cancer under 45 years old.
- Patients diagnosed within 6 months were eligible for study entry.
- Electronic surveys were administered at baseline and 1-year follow-up, which included questions about scalp cooling use, efficacy, satisfaction, and cost. Anxiety and depression were assessed through validated PROMIS measures.
- Pearson chi-squared, Kruskal-Wallis, and linear regressions statistics were used to test for associations between scalp cooling, PROMIS scores, and patient characteristics.
- Scalp cooling devices included Penguin, DigniCap, and other systems.

References

1. Choi EK, et al. Impact of chemotherapy-induced alopecia distress on body image, psychosocial well-being, and depression in breast cancer patients. Psychooncology. 2014 Oct;23(10):1103-10.

2. Rugo, HS et al. (2017). Association between use of a scalp cooling device and alopecia in women receiving chemotherapy for breast cancer. *JAMA*, 317(6), 606–614.

Patient Demographic Characteristics

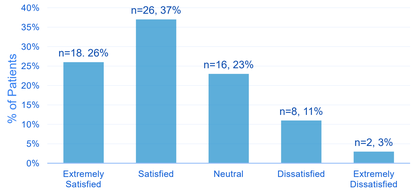
	Scalp cooling used		
	No	Yes	p-value
	96 (48)	106 (52)	
Age at diagnosis			
Median [IQR]	38 [34-41]	39 [34-41]	0.572
Relationship status			
Single	19 (20)	19 (18)	0.906
Married/domestic partner	60 (63)	70 (66)	
Committed relationship	16 (17)	17 (16)	
Highest education level			
High school degree	4 (4)	1 (1)	0.195
Some college	10 (10)	7 (7)	
College and higher degree	82 (85)	98 (92)	
Household income			
$0-49,999	14 (15)	6 (6)	0.066
$50,000-99,999	22 (23)	17 (16)	
$100,000-199,999	25 (26)	37 (35)	
≥ $200,000	35 (36)	46 (43)	
Children			
Yes	53 (55)	60 (57)	0.842
Race and ethnicity			
Asian	25 (26)	21 (20)	0.091
Black	2 (2)	3 (3)	
Hispanic	12 (12)	5 (5)	
Other	8 (8)	5 (5)	
White	49 (51)	72 (68)	
Type of chemotherapy			
non AC-containing regimen	57 (62)	76 (75)	0.046
AC containing regimen	35 (38)	25 (25)	
Receptor Subtype			
HR+/HER2-	36 (38)	54 (51)	0.057
HER2+	30 (31)	33 (31)	
HR-/HER2-	30 (31)	19 (18)	
Stage			
1	23 (24)	44 (42)	0.027
2	42 (44)	38 (36)	
3	31 (32)	24 (23)	

Results

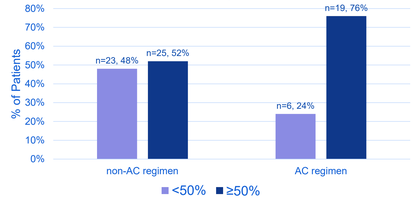
Demographic Associations

- Scalp cooling use was **not** associated with age, income, education level, having children, relationship status, or race.
- Patients who received non-AC regimens were **more likely** to use scalp cooling (p=0.046) compared to patients receiving AC-containing chemotherapy regimens.
- Patients with earlier stages of breast cancer were **more likely** to use scalp cooling (p=0.027).

Satisfaction with Scalp Cooling at 1-Year Follow-Up (n=70)



Percent Hair Loss Self-Reported at 1-Year Follow-Up By Chemotherapy Regimen (n=73)

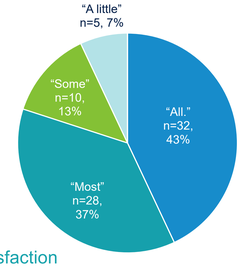


These results may differ from those of other studies due to the use of self-reported data at 1-year follow-up, and may reflect differences between clinical and patient assessment, as well as recall bias.

PROMIS Anxiety & Depression

- Patients that **planned** to use scalp cooling at the time of diagnosis had higher anxiety (p-0.046), but no association with depression scores was evident. Actual use of scalp cooling was not associated with anxiety or depression scores.
- PROMIS Anxiety & Depression scores at 1-year follow-up were **not associated** with degree of self-reported hair loss or recovery.

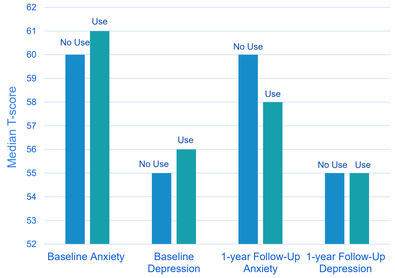
Self-Reported Hair Recovery at 1-Year Follow-Up (n=75)



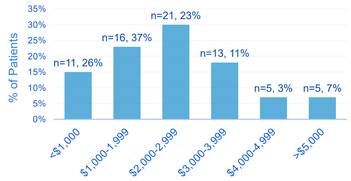
Hair Loss & Satisfaction

- Despite scalp cooling use, **60%** of our patient population reported losing of ≥ 50% of their hair.
- 79% of survey participants reported that they would **use scalp cooling again**, and 21% reported that they would not.
- Patients with less hair loss during chemotherapy were **more likely** to report satisfaction with scalp cooling use (p<0.001).
- At 1-year follow-up, the majority had recovery of at least most of their hair; however, 20% still had only little to some recovery.
- There was **no association** between patient-reported hair recovery at 1-year follow-up and their satisfaction with scalp cooling.

Baseline and 1-Year Follow-Up PROMIS Anxiety & Depression Median T-scores by Scalp Cooling Use (n=110)



Estimated Out-of-Pocket Expenses Spent on Scalp Cooling (n=71)



Financial Cost

- There is a wide range of out-of-pocket expense for patients.
- There was **no association** between out-of-pocket expense and satisfaction with scalp cooling at 1-year follow-up.

Conclusions

Hair Loss & Satisfaction

- The variability across hair loss, recovery, and financial burden emphasizes that the scalp cooling experience is personal and individual.
- A large majority of participants (79%) indicated they would use scalp cooling again, showing overall satisfaction with the treatment despite variable results.
- More effective and patient-centered methods to reduce chemotherapy-induced alopecia are needed.

Our Patient Population

- It is important to note that our sample was composed largely of White and Asian patients, as well as individuals with high socioeconomic status and education level. This highlights the need to expand the registry to more diverse populations.

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No conflicts of interest to disclose.

Thank you to our patients for being willing to participate in ongoing surveys as part of our registry database.