

The Association between Metabolic Health and Skin Cancer: A Cross-Sectional Analysis

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INTRODUCTION

- Skin cancer is the most prevalent cancer in the United States (Skin Cancer, 2022).
- Approximately 9,500 individuals per day are diagnosed of skin cancer (Skin Cancer, 2022).
- Melanoma causes about 9,000 deaths annually in the U.S. (Guy et al., 2015). (Rogers et al., 2015).
- Analysis of data from the Medical Expenditure Panel Survey indicates that around \$8.9 billion yearly is spent on skin cancer management. (Agency for Healthcare Research and Quality, 2023)

OBJECTIVE

- The study aims to identify the independent association between metabolic health* and skin cancer among adults in the United States using a cross-sectional analysis.
- Metabolic health includes participants having both obesity (BMI>25) and Diabetes

METHOD

- A cohort of 445,132 adults (>18 years) was sourced from the 2022 Behavioral Risk Factor Surveillance System (BRFSS) dataset.
- Our primary interest centered on participants' metabolic health (independent variable) and the association with skin cancer (dependent variable). All status were self-reported.
- Additionally, socio-demographic and life-style factors were explored, and potential confounding factors were considered.
- Statistical Analysis: We employed chi-square tests and multivariate logistic regression via SAS 9.4.

RESULTS

- Sample size: 367,322 responses were included in the final sample.

Baseline characteristics:

- Gender: 51% males, 60% were non-Hispanic Whites, 55% were above 44 years.
- Metabolic health: 11% had both obesity and diabetes.
- Prevalence of skin cancer: 12.5%.

Metabolic health and Skin cancer Association:

- Having both Diabetes and Obesity is associated with higher odds of skin cancer (AOR = 1.16, 95% CI = 1.10-1.23) after adjusting for other variables.
- Individuals over 44 years had 7.17 times higher odds of skin cancer (95% CI = 6.672-7.701).
- Being White (AOR = 2.02, 95% CI = 1.783-2.291) and female (AOR = 1.174, 95% CI = 1.128-1.223) increased the odds of skin cancer.
- Physical activity showed a protective effect (AOR = 0.86, 95% CI = 0.822-0.904).

Table 1: Descriptive Statistics of the Study Sample and Chi-square Analysis

Variable	Total n (%)	Skin Cancer (NO) n = 302,781 (87.54%)	Skin Cancer (YES) n = 64,541 (12.46%)	p-value
Gender				p<0.0001
Male	178,812 (50.56%)	149,131 (88.75%)	29,681 (11.25%)	
Female	188,510 (49.44%)	153,650 (86.30%)	34,860 (13.70%)	
Age (years)				p<0.0001
18-44	110,265 (45.30%)	106,906 (97.23%)	3,359 (2.77%)	
>44	257,057 (54.70%)	195,875 (79.51%)	61,182 (20.49%)	
Race/ethnicity				p<0.0001
Non-Hispanic Whites	277,022 (60.23%)	218,946 (83.10%)	58,076 (16.90%)	
Non-Hispanic Blacks	28,720 (11.54%)	26,555 (94.12%)	2,165 (5.88%)	
Hispanics	34,457 (17.47%)	32,342 (95.29%)	2,115 (4.71%)	
Non-Hispanic others	27,123 (10.76%)	24,938 (92.77%)	2,185 (7.23%)	
Physical activity				p<0.0001
No	85,785 (23.06%)	68,797 (84.84%)	16,988 (15.16%)	
Yes	281,537 (76.94%)	233,984 (88.35%)	47,553 (11.65%)	
Annual checkup				p<0.0001
No	76,575 (24.72%)	69,740 (93.91%)	6,835 (6.09%)	
Yes	290,747 (75.28%)	233,041 (85.45%)	57,706 (14.55%)	
Metabolic Health				p<0.0016
Good	321,750 (89.09%)	267,674 (88.34%)	54,076 (11.66%)	
Not good	45,572 (10.91%)	35,107 (81.02%)	10,465 (18.98%)	

Note: n = unweighted sample size. % = weighted percentage. Group difference tested with Chi-square test.

Figure 1 : Metabolic Health & Skin Cancer Prevalence

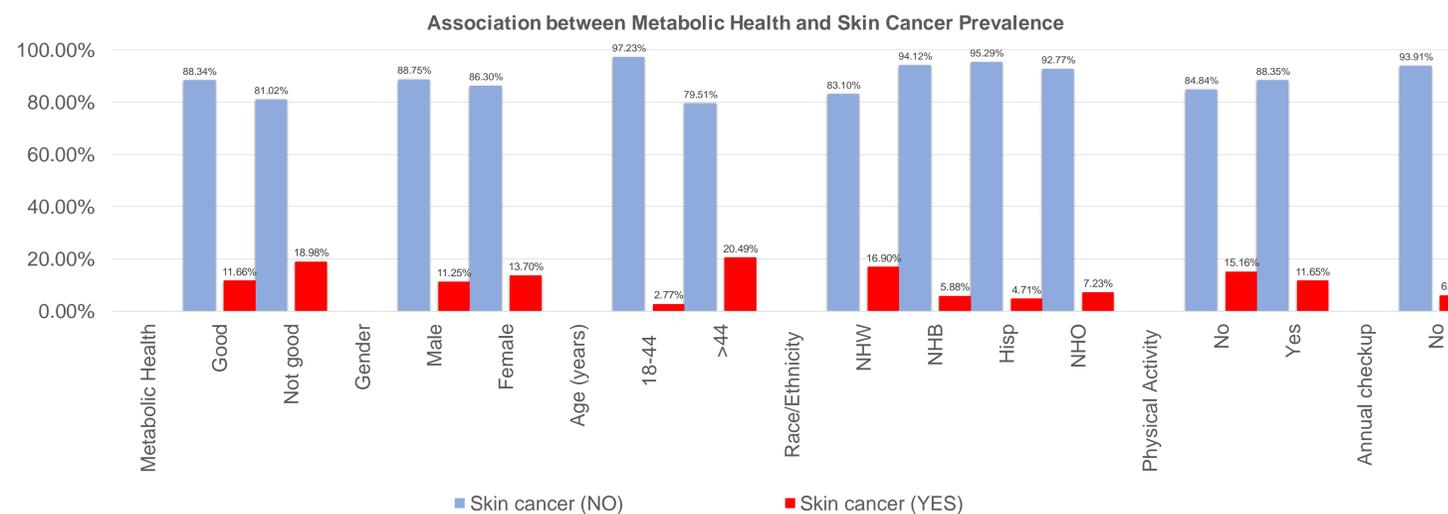


Table 2 Multiple Logistic Regression Analysis

Variable	AOR	95% CI
Gender		
Female	1.17	1.13- 1.22
Male	REF	REF
Age		
18-44 years	REF	REF
>44 years	7.17	6.67- 7.70
Race/ethnicity		
Non-Hispanic White	2.02	1.78- 2.29
Non-Hispanic Black	0.62	0.53- 0.72
Hispanics	0.65	0.56- 0.77
Non-Hispanic others	REF	REF
Physical Activity		
Not in the past 30 days	REF	REF
Yes, in the past 30 days	0.86	0.82- 0.90
Annual check-up		
No	REF	REF
Yes	1.67	1.56- 1.78
Metabolic Health		
Good	REF	REF
Not good	1.16	1.10- 1.23

Note: AOR = Adjusted Odds ratio. CI = Confidence interval. Boldface indicates statistically significant AOR (p<0.05). All variables in the table were adjusted in each regression model.

CONCLUSION

- Metabolic health, is positively associated with skin cancer.
- Public health initiatives should incorporate metabolic health into skin cancer prevention and awareness campaigns.
- Special emphasis should be placed on high-risk subgroups to address metabolic health in skin cancer prevention efforts.
- Interventions targeting lifestyle modifications, such as diet and exercise, along with sun protection behaviors can help mitigate skin cancer.
- Collaborative efforts between healthcare professionals, policymakers, and community organizations are essential for addressing both metabolic health and skin cancer prevention.