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Permalink

<https://escholarship.org/uc/item/51w0j0fv>

Journal

American Journal of Respiratory and Critical Care Medicine, 211(Abstracts)

ISSN

1073-449X

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Publication Date

2025-05-01

DOI

10.1164/ajrccm.2025.211.abstracts.a7474

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The Association Between Social Determinants of Health and Lung Cancer Screening Adherence: A Secondary Analysis of the BRFSS Data

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Classification: 18. Lung Cancer, Thoracic Oncology

Discipline: Adult

Subclassification: Health Services Research/Quality Improvement/Implementation Science

Reviewing Assembly: Behavioral Science & Health Services Research (BSHSR)

Max word count: 400

RATIONALE

Addressing the social determinants of health (SDOH) that contribute to health disparities is a central focus of the U.S. Healthy People 2030 agenda. Given the suboptimal adherence to lung cancer screening (LCS), this study explores the associations between SDOH and LCS adherence.

METHODS

This was a cross-sectional analysis of publicly available data from the 2022 Behavioral Risk Factor Surveillance System (BRFSS) dataset of screen-eligible respondents ages 50-79 who indicated that they had ever received a prior lung cancer screen (i.e. answered Yes to ““Were any of the CT or CAT scans of your chest area done mainly to check or screen for lung cancer?””). The outcome was subsequent adherence to LCS guidelines. Participants were classified as adherent if they responded “Within the past year (anytime less than 12 months ago)” to the question “When did you have your most recent CT or CAT scan of your chest area mainly to check or screen for lung cancer?” They were classified as non-adherent if they responded that their most recent scan was more than 12 months ago. Independent variables in the bivariate logistic regression models were ten SDOH variables (e.g., life satisfaction, emotional support, social isolation, financial issues, and stress) from the Social Determinants and Health Equity module of the BRFSS 2022 dataset. The multivariable logistic regression model included all ten SDOH variables, in addition to demographics, education, income, primary insurance, and comorbidities.

RESULTS

Among 8170 participants who met the inclusion criteria, most were 60-69 years old (48.1%), male (54.7%), and of White race (83.1%). In bivariate analyses, lower satisfaction with life (dissatisfied vs. very satisfied, odds ratio [OR]: 0.75, 95% confidence interval [CI]: 0.59-0.94)

and reduced emotional support (e.g., sometimes vs. always, OR:0.76, 95% CI: 0.65-0.90) were associated with decreased odds of being adherent to LCS. Conversely, the ability to pay bills (yes vs. no, OR: 1.23, 95% CI: 1.03-1.47) and experiencing less stress (e.g., never vs. always, OR: 1.32, 95% CI: 1.05-1.66) were associated with increased odds of being adherent. In the multivariable analysis, less emotional support (usually vs. always, adjusted OR [aOR]: 0.82, 95% CI: 0.70-0.97) was associated with decreased odds of adherence, while experiencing less stress (usually vs. always, aOR: 1.58, 95% CI: 1.11-2.25) was associated with increased odds.

CONCLUSIONS

Social and emotional factors significantly impact LCS adherence. Targeted psychosocial interventions may improve LCS adherence rate.

Table. Logistic regression analyses between social determinants and health equity variables and adherence to lung cancer screening in the BRFSS 2022 dataset (N=8170).

Variable	Bivariate		Multivariable ^a n=4062
	n	OR (95% CI)	aORa (95% CI)
In general, how satisfied are you with your life? (Ref: Very satisfied)	5042		
Satisfied		0.96 (0.85, 1.09)	1.01 (0.87, 1.17)
Dissatisfied		0.75 (0.59, 0.94)	0.90 (0.66, 1.22)
Very dissatisfied		0.81 (0.55, 1.22)	1.04 (0.61, 1.79)
How often get emotional support needed? (Ref: Always)	5032		
Usually		0.83 (0.72, 0.95)	0.82 (0.70, 0.97)
Sometimes		0.76 (0.65, 0.90)	0.82 (0.66, 1.01)
Rarely		0.93 (0.73, 1.19)	0.96 (0.71, 1.31)
Never		0.77 (0.60, 0.99)	0.83 (0.61, 1.14)
How often do you feel socially isolated from others? (Ref: Always)	5052		
Usually		0.86 (0.62, 1.18)	0.85 (0.58, 1.25)
Sometimes		1.03 (0.79, 1.34)	1.03 (0.74, 1.43)
Rarely		1.04 (0.79, 1.35)	0.96 (0.68, 1.34)
Never		1.10 (0.85, 1.42)	1.02 (0.73, 1.42)
Have you lost employment or had hours reduced in the past 12 months? (Ref: Yes)	5056		
No		1.16 (0.92, 1.46)	0.98 (0.75, 1.28)
During the past 12 months have you received food stamps in the past 12 months? (Ref: Yes)	5079		
No		1.03 (0.89, 1.19)	1.08 (0.87, 1.33)
How often did the food that you bought not	5056		

last, and you didn't have money to get more in the past 12 months? (Ref: Always)			
Usually		0.90 (0.59, 1.38)	0.95 (0.57, 1.58)
Sometimes		0.87 (0.63, 1.22)	0.83 (0.56, 1.23)
Rarely		0.83 (0.59, 1.14)	0.74 (0.50, 1.10)
Never		0.93 (0.69, 1.24)	0.75 (0.52, 1.08)
Were you not able to pay your bills in the past 12 months? (Ref: Yes)	5065		
No		1.23 (1.03, 1.47)	1.11 (0.85, 1.43)
Were you not able to pay utility bills or threatened to lose service in the past 12 months? (Ref: Yes)	5059		
No		1.14 (0.92, 1.40)	0.98 (0.74, 1.30)
Has a lack of reliable transportation kept you from appointments, meetings, work, or getting things needed in the past 12 months? (Ref: Yes)	5052		
No		1.17 (0.97, 1.41)	1.18 (0.93, 1.51)
How often have you felt stress in the past 30 days? (Ref: Always)	5029		
Usually		1.41 (1.05, 1.90)	1.58 (1.11, 2.25)
Sometimes		1.18 (0.93, 1.50)	1.19 (0.87, 1.60)
Rarely		1.21 (0.96, 1.54)	1.19 (0.86, 1.63)
Never		1.32 (1.05, 1.66)	1.37 (1.00, 1.88)

Abbreviations: BRFSS: Behavioral Risk Factor Surveillance System; OR: odds ratio; CI: confidence interval; aOR: adjusted odds ratio.

Notes: ^aThe multivariable logistic regression adjusted for age, sex, race/ethnicity, education level, household income, primary insurance, and comorbidities. Comorbidities included a report of a past diagnosis of myocardial infarction, coronary heart disease, stroke, asthma, chronic obstructive pulmonary disease, arthritis, depression, kidney disease, diabetes, or cancer. Complete cases analyses were performed for both bivariate and multivariable models.