Assessing the Effectiveness of Cancer Screening Interventions Targeting Appalachian Populations: a Systematic Review

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BACKGROUND
• Appalachian residents have a higher cancer prevalence and invasive cancer incidence in almost all cancer types regardless of sex or race/ethnicity compared to non-Appalachian residents1
• In Appalachia, unique cancer screening barriers include distrust in the healthcare system, low health literacy, geographic isolation, and a fatalistic view of cancer, which perpetuates low cancer screening uptake2,3
• Diverse health promotion interventions have been implemented, but the burden of cancer in Appalachia remains unchanged since the 1960s4
• Understanding the effectiveness of the wide range of public health interventions targeting cancer screening in Appalachia in terms of uptake of breast, cervical, colorectal, lung, and prostate cancer screening may lead to more effective interventions.

Objective: To assess the effectiveness of interventions aimed at increasing uptake and/or continuing participation in cancer screening among Appalachian residents.

METHODS
• We searched MEDLINE, Applied Social Science Index and Abstracts, Psychological Information Database, Psychology and Behavioral Sciences Collection, Cumulative Index to Nursing and Allied Health Literature, Cochrane Central Register of Controlled Trials, and Web of Science Core Collection (gray literature)
• MeSH and free-text search terms relating to breast, cervical, colorectal, lung, and prostate cancer; mass screening; health promotion; and Appalachia were used with no language and date restrictions
• Inclusion Criteria: Participants eligible for annual cancer screening according to 2019 ACS guidelines by cancer type and residing in an Appalachian Regional Commission recognized Appalachian county in all study designs
• Primary Outcome: proportion/percent of uptake and/or the continuing participation of cervical, breast, prostate, lung, and/or colorectal cancer screening
• The EPHP Quality Assessment Tool for Quantitative Studies and the MMAT evaluated the quality of quantitative and mixed-methods studies, respectively

RESULTS
Screening Intervention by Cancer Type and Setting
• 15 studies reported uptake and/or continued participation in screening interventions focusing on cervical (n=7), colorectal (n=5), breast (n=2), and lung (n=1) cancers in Appalachia.
• Included studies were set in Kentucky (n=6), Pennsylvania (n=4), Ohio (n=3), and North Carolina (n=2).

Screening Intervention Effectiveness
• Effectiveness of cancer screening interventions was measured by the proportion of study participants who were presented with a screening opportunity who eventually participated in screening.

Quality Assessment
• Quality assessment was performed based on quantitative (n=13) or mixed-method study (n=2) design using the EPHP tool and MMAT tools, respectively.
• Among our included quantitative studies (n=13), five studies were “weak,” three studies were “moderate,” and five studies were “strong” quality.
• Many studies had substantial selection bias due to participant recruitment from clinical settings. Few studies reported statistical significance and p-values of screening uptake between study groups.
• Mixed methods studies (n=2) were high quality with limited selection bias, and participants were representative of the target population.

CONCLUSION
• Interventions with multiple strategies, community-based organization involvement, and targeting unscreened populations were effective in increasing cancer screening uptake and/or continued participation in Appalachia.
• Few studies focused on breast and lung cancer screening, and no studies focused on prostate cancer.
• As disparities in cancer screening, morbidity, and mortality between Appalachian and non-Appalachian residents widen, there is an urgent need for further research and implementation of effective cancer prevention and screening interventions in this vulnerable region.

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