

Barriers and Facilitators Impacting Lung Cancer Screening Uptake Among Black Veterans: A Qualitative Study

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Abstract

Background: Racial disparities in lung cancer screening (LCS) are well established. Black Veterans are among those at the highest risk for developing lung cancer but are less likely to complete LCS. We sought to identify barriers and facilitators to LCS uptake among Black Veterans. **Patients and Methods:** A qualitative study using semistructured interviews was conducted with 32 Black Veterans to assess for barriers, facilitators, and contextual factors for LCS and strategies to improve screening. Veterans were purposively sampled by age, sex, and LCS participation status (ie, patients who received a low-dose CT [LDCT], patients who contacted the screening program but did not receive an LDCT, and patients who did not connect with the screening program nor receive an LDCT). Interview guides were developed using the Theoretical Domains Framework and Health Belief Model. Data were analyzed using rapid qualitative analysis. **Results:** Barriers of LCS uptake among Black Veterans include self-reported low LCS knowledge and poor memory, attention, and decision processes associated with the centralized LCS process. Facilitators of LCS uptake among Black Veterans include social/professional role; identity and social influences; perceived susceptibility, threat, and consequences due to smoking status and military or occupational exposures; emotion, behavioral regulation, and intentions; and high trust in providers. Environmental context and resources (eg, transportation) and race and racism serve as contextual factors that did not emerge as having a major impact on LCS uptake. Strategies to improve LCS uptake included increased social messaging surrounding LCS, various forms of information dissemination, LCS reminders, balanced and repeated shared decision-making discussions, and streamlined referrals. **Conclusions:** We identified addressable barriers and facilitators for LCS uptake among Black Veterans that can help focus efforts to improve disparities in screening. Future studies should explore provider perspectives and test interventions to improve equity in LCS.

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Background

Lung cancer is the most common cause of cancer mortality in the United States, with Black males having the highest age-adjusted incidence and mortality among all racial and ethnic groups.^{1–3} Annual low-dose CT (LDCT) scans allow for early detection and are recommended for screening based on 2 randomized controlled trials showing a 25% reduction in mortality,^{4,5} a benefit that is greater among Black individuals compared with White individuals.⁶

Despite this mortality benefit, significant racial disparities in lung cancer screening (LCS) exist.^{1,3,7} Black individuals are nearly 3 times less likely to be screened than White individuals, even after adjusting for age, sex, body mass index, comorbidities, family history of lung cancer, and smoking status.^{8,9} A systematic review found that among LCS-eligible patients, Black patients had a significantly lower rate of initial LCS completion as well as annual adherence.¹⁰ These studies suggest that substantial work is needed to ensure more equitable implementation of LCS referral and uptake.

The Veterans Affairs Health Care System (VAHCS) first began LCS in 2013 as part of a national implementation program.¹¹ In contrast to civilian health care centers, the VA provides LCS at no or very minimal cost to Veterans. Yet, disparities in LCS persist in this setting.^{12–14} For example, a recent single-center analysis revealed that only 30.5% of Black Veterans referred for screening received an LDCT, compared with 41.3% of White Veterans.¹⁵

This finding underscores the need to understand factors influencing LCS rates among Black Veterans in order to develop strategies to improve equity.

The aim of this qualitative study was to identify barriers and facilitators to LCS uptake among Black Veterans, understand the contextual factors that might influence their participation, and explore patient input on how the screening process may be improved.

Patients and Methods

Study Design and Setting

We conducted a qualitative study using semistructured interviews within the Durham, North Carolina VAHCS, which has a centralized LCS program (see Appendix 1 in the supplementary materials, available online with this article). All study procedures were approved by the Durham VAHCS Institutional Review Board (protocol #1622197).

Participants and Recruitment

We used purposive sampling from the local VA LCS database to ensure diversity in age, sex, and LCS participation. LCS participation types included patients who received a screening CT, patients who contacted the screening program but did not receive a screening CT, and patients who neither contacted the screening

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program nor received a screening CT. Inclusion criteria included Veterans who were referred to the LCS program within the last 7 years, self-identified as Black or African American, and spoke English.

Medical record systems were used to identify and contact potential participants for interviews as well as to corroborate patient-provided information about contact with the screening program. Eligible patients were mailed a study introduction letter containing information to opt out of participation. Those who did not opt out received a phone call to further explain the study and, if agreeable, to schedule an interview.

Instrument Development and Data Collection

We used the Theoretical Domains Framework (TDF) and Health Belief Model (HBM) to develop interview guides and inform the major domains of analysis.^{16,17} Four interview guides were developed; one for each LCS participation, and an additional guide adapted for participants diagnosed with lung cancer via screening (see Table S1 in the supplementary materials). We anticipated that Veterans may share racialized experiences while discussing barriers to screening. When that did not emerge, we added 2 probes to elicit reflection on experiences of race in the medical system. Thus, not all participants were asked directly about racial experiences. Interviews were conducted by qualitative analysts and/or the principal investigator using Microsoft Teams and were audio recorded and auto-transcribed. Interviews lasted 24 to 89 minutes. There was racial concordance between the study recruiter and/or interviewer and Veterans for all interviews. Our sample size was guided by the concept of information power.¹⁸ The team met regularly to discuss our level of information, based on the specificity of the aim of this study, the sample, the use of theory to guide our work, the quality of dialogue with trained interviewers, and our rigorous analysis strategy, and concluded that we achieved appropriate information power prior to ending data collection.

Data Analysis

The study team, which included 2 clinicians, a study coordinator, and 2 analysts, analyzed interview data using Hamilton's approach to rapid qualitative analysis.¹⁹ This included a team-based approach to iterative memo development and utilization of matrices to array data for analysis. Interview transcripts and structured notes were reviewed by an analyst, edited for

clarity, and summarized into matrices in Microsoft Excel guided by TDF, HBM, and interview questions. Further analyses consisted of iterative memo development and matrix analyses to elucidate common and contrasting experiences and identify themes.²⁰ Transcripts, and audio recordings as necessary, were reviewed for accuracy of findings and to extract quotations. The team met weekly to review subsets of the analyses. Analytic disagreements were resolved through discussion and consensus. The study team followed the Standards for Reporting Qualitative Research recommendations.²¹

Results

Our analyses included interviews with 32 Black Veterans (21.9% female; mean age, 67.6 years). Demographic characteristics are shown in Table 1. Of note, we interviewed 4 Veterans who were diagnosed with lung cancer after LCS. We report separate findings for this group when their reflections on their LCS experience differ significantly from those without a lung cancer diagnosis.

We mapped 9 analytic themes using a combination of the 14 TDF domains and the HBM (Figure 1). Themes were divided into 4 categories around LCS uptake: barriers, facilitators, contextual factors, and Veteran recommendations and suggestions. Selected quotations on barriers and facilitators to LCS uptake are presented in Supplementary Table S2, selected quotations on contextual factors are presented in Supplementary Table S3, and selected quotations on Veteran recommendations and suggestions are presented in Supplementary Table S4. Barriers included knowledge and skills; and memory, attention, and decision processes. Facilitators included social/professional role, identity, and social influences; emotion, behavioral regulation, self-efficacy, and intentions; perceived susceptibility, threat, and consequences; and trust. Contextual factors included environmental context and resources, and race and racism. Individual examples may differ in valence from the overall category but are discussed with their parent theme.

Barriers and Facilitators to LCS Uptake Knowledge and Skills

Most Veterans claimed to have little or no general knowledge of LCS at the beginning of the interviews regardless of LCS participation type. Female Veterans were more readily knowledgeable about LCS compared with male Veterans. However, when probed

Table 1. Participant Characteristics

	Called LCS Program, Received LDCT		Called LCS Program, No LDCT n (%)	No Connection n (%)	Total n (%)
	Lung Cancer Diagnosis n (%)	No Lung Cancer Diagnosis n (%)			
Participants, N	4	13	7	8	32
Sex					
Female	0 (0)	4 (30.8)	0 (0)	3 (37.5)	7 (21.9)
Male	4 (100)	9 (69.2)	7 (100)	5 (62.5)	25 (78.1)
Age, mean [SD], y	66.8 [2.1]	65.9 [4.5]	70.4 [3.6]	68.3 [6.7]	67.6 [4.9]
Pack-year history, mean [SD]	45.8 [5.3]	46.5 [14.7]	45.4 [7.5]	42.8 [8.7]	45.3 [10.8]
Smoking status					
Current smoker	4 (100)	9 (69.2)	3 (42.9)	4 (50.0)	20 (62.5)
Former smoker	0 (0)	4 (30.8)	4 (57.1)	4 (50.0)	12 (37.5)
Years quit at LCS referral, mean [SD]	N/A	7.5 [4.8]	9.8 [4.4]	9.5 [4.2]	8.92 [4.2]

Abbreviations: LCS, lung cancer screening; LDCT, low-dose CT; N/A, not applicable.

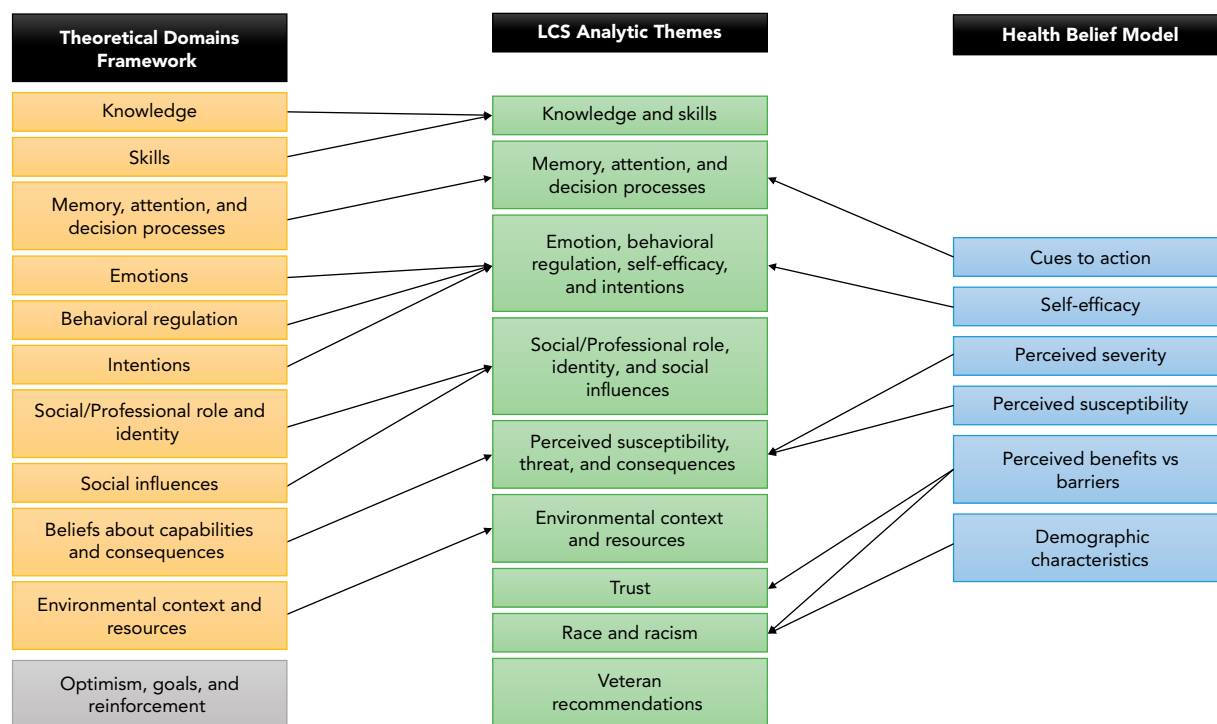


Figure 1. LCS analytic themes. Nine analytic themes regarding LCS uptake derived from a combination of the Theoretical Domains Framework and Health Belief Model.

Abbreviation: LCS, lung cancer screening.

further about the purpose of LCS, most Veterans associated LCS with early detection of lung cancer. Most Veterans, even those who completed a LDCT, claimed to have little or no knowledge of the LCS process. However, once the LCS process was explained during the interview, Veterans did not perceive it as difficult nor did they identify any specific skills needed to complete screening.

Memory, Attention, and Decision Processes

Despite having documented conversations with the program coordinator in the electronic medical record, many Veterans did not recall this shared decision-making discussion. In addition, most Veterans who were screened believed that the LDCT was scheduled by their provider or the radiology department. Veterans frequently stated that they had already decided to be screened before their discussion with the screening program coordinator.

Veterans who connected with the program but did not complete an LDCT were unsure or did not remember what prevented them from being screened. Several did not think that they would have declined to participate in LCS. Several Veterans who did not connect with the program said that they did not recall receiving a letter, whereas a few remembered receiving the letter but lost it or could not recall its contents.

Social/Professional Role, Identity, and Social Influences

Many Veterans connected their military occupational experiences to their lung health risks, reflecting on how their occupational duties exposed them to carcinogenic materials. A few Veterans had lung conditions, such as emphysema, that they directly connected to their service. Several Veterans discussed how military

culture encouraged smoking (eg, cigarettes were included in ration packs, smoke breaks were offered in training).

Most Veterans who participated in LCS described strong social influences regarding their lung health and health care decisions, citing discussions with partners, children, siblings, friends, or “military buddies.” Veterans who did not participate in LCS more commonly said that they only discussed lung health with providers, and several stated that they avoid talking about health concerns with family and friends. These Veterans described some level of self-regulated social isolation, stating that they attended appointments alone and avoided conversations about LCS with their family or friends to avoid pessimistic conversations about failing health, avoid making others worry, or circumvent “nonprofessional” opinions.

Emotion, Behavioral Regulation, Self-Efficacy, and Intentions

Veterans who completed LCS described experiencing mild anxiety prior to their screening, mostly related to the possibility of having cancer. However, those who completed LCS rationalized that they needed to identify cancer to treat it. Veterans also described themselves or others deferring LCS due to fear. One female Veteran shared her fatalistic beliefs about LCS because both her mother and sister died of lung cancer soon after being diagnosed.

Participants diagnosed with cancer had varied emotional responses: 1 Veteran expressed having a lot of anxiety and emotional distress, whereas another described how his medical and moral support helped him handle it well and how he generally felt good if he avoided getting “too emotional.” Veterans explained that emotional factors did not play a role in their LCS decision; seeing it as an impartial tool, they expressed

sentiments such as, “the results were going to be what they were anyway.”

Veterans made their screening decisions based on information from their providers and the LCS program. One Veteran initially had concerns about radiation exposure from LCS but decided to participate after receiving education about LDCTs. Smoking cessation status emerged as a relevant factor in LCS decisions for a small group of participants. These Veterans opted to get screened to mitigate their mortality risk because they found smoking cessation difficult.

Most Veterans expressed a desire to be screened. Many who had not been screened could not recall what prevented them from participating, and several of these Veterans expressed intent to complete LCS during the interview. This was not universal, however, and a few Veterans actively decided against LCS based on false-positive rates.

Perceived Susceptibility, Threat, and Consequences

Veterans across screening groups believed everyone should be screened for lung cancer. They also emphasized that individuals with smoking histories, second-hand smoke exposure, and exposure to potential carcinogens, such as asbestos, burn pits, chemical warfare, and occupation-specific respiratory agents, were at the highest risk.

Most Veterans perceived LCS to be important and felt that they should be screened, usually due to their smoking, occupational, or family history. Two Veterans diagnosed with lung cancer shared that prior to being screened, they did not believe they needed to be screened and did not think cancer could happen to them.

Across screening groups, most Veterans did not see risks to being screened. A few initially declined LCS because they did not want to know whether they had cancer. Several discussed radiation as a potential risk but ultimately decided that it was not a major concern. No Veterans declined LCS due to radiation risk. Veterans who declined LCS or did not connect were most concerned about false-positive results. Veterans overall felt that the benefits of LCS outweighed the risks and perceived the biggest threat to be the screening results.

Trust

Although mistrust in providers or the health care system has been described as a barrier to LCS uptake among Black Veterans,^{22,23} Veterans across screening groups described high levels of mutual trust, trust in providers' judgement, and overall positive relationships with their providers. For example, one Veteran shared that her doctor gave her their personal phone number, and 2 others described their providers demonstrating vested interest in their personal lives and understanding their perspectives. In addition, Veterans recounted shared decision-making conversations with their providers before they were referred for LCS, and many Veterans who completed LCS indicated their eagerness to follow their provider's recommendation to get screened.

A few Veterans described experiences of poor relationships or mistrust with the medical system. One Veteran described a perceived lack of concern and an imbalance of shared knowledge of LCS from her provider; a lung cancer survivor considered the possibility that the VA was intentionally ambiguous about his diagnosis, and another Veteran briefly explained that mistreatment of Black Americans by the medical system more broadly has fostered feelings of mistrust in the community.

Selected quotations on barriers and facilitators to LCS uptake are presented in Supplementary Table S2.

Contextual Factors Around LCS Uptake

Environmental Context and Resources

Most Veterans did not identify significant environmental contexts or resource barriers to LCS. The main contextual differences between Veterans who were screened and those who were not was their referral experiences and process. Those who were screened described a seamless scheduling process, whereas Veterans who were not screened often described it as having never been scheduled.

Transportation, an a priori assumed barrier based on prior studies, did not emerge as a common barrier.^{24,25} Among Veterans who were screened, a few described scheduling and distance to the VA as a mild inconvenience, but transportation was not frequently presented as a factor influencing their decision. Notably, a few veterans who had not completed LCS expressed concern about transportation accessibility and cost, but this was not commonly cited as a barrier.

Race and Racism

Like mistrust, racism and discrimination were a priori assumed barriers to LCS uptake that did not emerge from the data.^{22,23} Veterans in our sample generally did not share experiences of racism while navigating the VA, and no Veterans in our sample directly connected experiences with racism with their LCS decision. However, some Veterans described how they have developed skills, networks, and mechanisms that support their confidence while navigating the medical system as Black Americans, implicitly suggesting their awareness that bias and racism may impact their care. When asked why they believed disparities in LCS uptake between Black and White Veterans exist, participants indicated that other Black Veterans may be fearful of the results or may not actively address health care needs until it becomes urgent.

Two Veterans illustrated experiences of racial bias while navigating medical systems more generally. One described observations of racism in medicine over the span of their life; another illustrated their personal experience with subconscious bias and racism while navigating pain management after a non-pulmonary-related procedure at a non-VA hospital.

Selected quotations on contextual factors related to LCS uptake are presented in Supplementary Table S3.

Veteran Recommendations to Improve LCS Uptake

Veteran recommendations for increasing awareness and uptake of LCS among Black Veterans included discussing LCS in the Stop Smoking Clinic, hosting classes, sending information pamphlets and brochures via email and postal mail, disseminating pamphlets in communities, reaching out to Veterans via phone instead of mail, and simplifying medical terminology in pamphlets or brochures. One Veteran recommended that LCS be a conversation that occurs at every primary care appointment to keep the topic “on [the patient's] mind.”

Among Veterans lost to follow-up after being referred for LCS, most did not recall receiving a letter. Some of these Veterans requested more flexible and assistive scheduling, including reminders about next steps, prompts to stay on track, and walk-in LCS appointments.

Veteran recommendations and suggestions are presented in Supplementary Table S4.

Discussion

We identified several important first-person experiences of barriers, facilitators, and contextual factors influencing participation in LCS among Black Veterans, and their views on how the screening process may be improved.

Barriers to LCS uptake included low levels of knowledge and skills regarding LCS and poor memory, attention, and decision processes (eg, had other priorities, forgot). Low knowledge was reported even by Veterans who completed screening, supporting prior studies that found low levels of knowledge and awareness among LCS-eligible populations.^{26,27} In addition, shared decision-making conversations with the screening coordinator and connection with the program were infrequently recognized by Veterans as a core component of the LCS process, underscoring a major barrier within centralized programs. Veterans also reported that false-positive rates were a reason that they did not complete screening. Although this reflects shared decision-making and not a barrier per se, data regarding false-positive rates should be carefully contextualized for patients.

Facilitators included that Veterans had a high degree of trust in their providers and their recommendations, demonstrating an eagerness to follow provider recommendations to get screened. This is consistent with several studies that have found provider endorsement to be a key facilitator for LCS.^{28,29} Furthermore, Veterans who participated in LCS described having strong connections and conversations with friends, family, and “military buddies,” whereas those who did not get screened reflected social isolation and tended to purposely avoid discussing their health matters with anyone other than their providers. Nearly all Veterans across screening groups were interested and willing to participate in LCS and felt that their military experience and exposures were an important risk factor for lung cancer. In fact, several Veterans who were not previously screened expressed willingness and intent to do so in the future, indicating that the qualitative interview may have inadvertently served as a shared decision-making tool.

Although we anticipated that LCS uptake would be impacted by constrained resources or race and racism, few Veterans discussed these concerns. This is consistent with our prior quantitative work demonstrating that rurality was not significantly associated with LCS completion¹⁵ as well as past work demonstrating that structural and systemic racism did not affect Black or African American participants’ beliefs about lung cancer.³⁰ We hypothesize that this may be due to the study’s focus on patient-provider-program interactions regarding LCS rather than broader systems-level experiences or possible participant discomfort in discussing these topics with our study team. Thus, it is important to consider the subconscious roles racism and implicit bias play in medical systems and the need for further community engagement to better understand the ways structural and systemic racism impact LCS uptake among Black Veterans.

Our findings highlight several potential interventions to improve LCS uptake among Black Veterans at the patient, provider, and system levels. These include increasing awareness through community channels; leveraging Veteran social networks or peer navigators; using technology, pamphlets, and

other information-sharing mediums; incorporating multiple reminders; establishing a more streamlined referral process; providing alternate means of shared decision-making discussions; and offering same-day LDCTs. Community engagement interventions may be especially effective and are currently being studied.³¹ Our findings further underscore the importance of high-quality, shared decision-making discussions between Black Veterans and their providers. Shared decision-making discussions have been shown to be unbalanced and poor in quality across a range of populations.^{32–34} Our concepts regarding trust and knowledge and skills are consistent with findings by Golden et al³⁵ that although shared decision-making conversations may not meet all criteria of high-quality communication, patients have high degrees of trust in their clinicians, indicating their relative value of interpersonal communication rather than information exchange. Given the disparities in LCS uptake among Black Veterans, improving the quality of shared decision-making conversations and reassessing interest regularly are salient areas for intervention.

Our study has several strengths, including its focus on Black Veterans, which allowed us to successfully capture the experiences of a large, historically underserved group. We were also able to successfully recruit participants with diversity with regard to sex, smoking status, and screening participation, thus capturing a broad range of perspectives. Additionally, racial concordance between the study recruiter, primary interviewer, and the participants may have increased Veterans’ comfort discussing issues surrounding race and racism.

We acknowledge the limitations of our study. First, it is unclear if and how telephone interviews impacted participant recruitment and participation. In-person interviews may have elicited more in-depth or nuanced responses from Veterans. Second, not all participants were directly asked about racial experiences, and the question remains if and how a more direct exploration of systemic racism may have influenced our findings. Finally, our findings are unique to a specific underrepresented group in a single health care system and may not be widely transferrable.

Conclusions

We identified addressable barriers and facilitators for LCS uptake among Black Veterans that can help focus efforts to improve disparities. Future studies should explore provider perspectives on barriers and facilitators to LCS among Black Veterans as well as develop and test interventions to improve equity in LCS.

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