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High-risk community and primary care providers knowledge about and barriers to low-dose computed topography lung cancer screening

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ABSTRACT

Introduction: Until recently, there has not been a valid and reliable screening test for lung cancer. As compared to chest X-ray, low-dose computed tomography (LDCT) lung cancer screening has demonstrated greater sensitivity resulting in lung cancer diagnosis at an earlier stage, thereby reducing lung cancer mortality among high-risk individuals by 20%. In the current study, we sought to examine knowledge and attitudes about LDCT screening for lung cancer among an ethnically and racially diverse sample of high risk (HR) community members and primary care providers (PCP).
Methods: Eligible individuals participated in a focus group using semi-structured interview guides. Focus groups were conducted with PCPs (by telephone) and HRs (in-person). Sessions were audio-taped and transcribed verbatim. The constant comparison method and content analysis were used to analyze results.
Results: The majority of PCPs had limited knowledge of lung cancer CT screening. PCPs cited barriers to recommendation including, cost/insurance barriers and the potential for false positives. PCPs perceived the main benefit to be early detection of lung cancer. The majority of HRs had never heard of lung LDCT screening and had never had a healthcare provider recommend it to them. Perceived barriers included fear of results (bad news) and financial costs. The main perceived benefit was early detection.
Conclusion: Lack of knowledge about LDCT was a key a barrier across both the PCP and HR. respondents. Understanding the barriers to lung screening across diverse community populations is necessary to improve screening rates and shared decision-making.

1. Introduction

In 2016, an estimated 224,390 new cases of lung cancer will be diagnosed in the United States, resulting in 158,080 deaths [1]. Although mortality rates from lung cancer have declined over the last 25 years, primarily due to decreases in cigarette smoking, lung cancer remains the second most commonly diagnosed cancer nationwide in both men and women, and the leading cause of cancer death [1–3]. Smoking is the chief cause of lung cancer and is responsible for approximately 90% of lung cancer deaths in the US [4].

Until recently, there has not been a valid and reliable screening test for lung cancer. In 1970, The American Cancer Society (ACS) began recommending lung cancer screening by chest X-ray (CXR) both with and without sputum cytology [5]. CXR has many limitations including high rates of false positives and false negatives [5,6]. Lung cancer mortality rates remained relatively stagnant and ACS retracted the recommendation for CXR for lung cancer screening in 1980 [5]. In 2002, The National Lung Screening Trial (NLST) began an 8 year randomized clinical trial with 53,454 participants [7]. High-risk (HR) participants were randomized to receive 3 annual lung cancer screenings with CXR or low-dose computed tomography (LDCT). Findings from this trial indicated a reduction in mortality with LDCT. The increased sensitivity of LDCT allowed for easier readability and diagnosis at an earlier stage, thereby reducing lung cancer mortality among HR individuals by 20% [3,5,8,9]. Similar

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clinical trials have been conducted in European countries, such as, the Dutch-Belgian NELSON Trial [10], the UKLS Trial in the United Kingdom [11], the DANTE Trial in Italy [12], and the Danish Randomized Lung Cancer CT Screening Trial [13].

Based on the NLST findings, the United States Preventative Services Task Force (USPSTF) issued a B recommendation supporting LDCT screening for HR individuals defined as individuals ages 55–80, at least a 30-pack year history of smoking, and current smokers or former smokers who have quit within the past 15 years [14]. In January 2015, the Affordable Care Act mandated private insurance companies to cover LDCT for HR individuals [15]. In February 2015, the Centers for Medicare and Medicaid Services (CMS) began covering LDCT screening for lung cancer with a written prescription from a physician and documentation of shared decision making [16]. Nationwide organizational support for lung cancer screening by LDCT has generally been positive. The American Lung Association, American Cancer Society, and American Society of Clinical Oncology support LDCT screening. Conversely, the Academy of Family Physicians concluded the evidence is insufficient to recommend screening [17].

Despite the supportive landscape, LDCT screening uptake appears to be generally low [18]. Wide-scale implementation of LDCT screening relies on primary care provider (PCP) referral. However, little is known about how, or if, PCPs are discussing or recommending LDCT screening. To date, few studies have examined PCPs attitudes and practices regarding lung cancer screening with LDCT. Using survey methodology, Lewis et al. [19] found that few PCPs were ordering LDCT and barriers included patient cost, insurance coverage, and concerns regarding efficacy. In addition to understanding PCP perspectives on LDCT screening, community engagement is imperative. Few studies have examined HR individual perspectives, and the majority has used survey methodology. Identified barriers include lack of knowledge of LDCT screening [20], cost concerns (insurance coverage and possible follow-up procedures) [20,21], and fears of radiation and results [4,20,21]. Given recent changes in coverage for LDCT it is important to learn if cost concerns remain as a perceived barrier to screening.

In this study, we sought to examine the barriers to screening, including knowledge and attitudes about LDCT screening for lung cancer among an ethnically and racially diverse sample of HR community members and PCPs (physicians, nurse practitioners, and physician assistants). Together, these data can be used to develop strategies to increase the likelihood that LDCT guideline recommendations are met. Moreover, comparing the perspectives of these two key stakeholder groups can aid in the creation of effective patient-provider communication tools and may reveal gaps in knowledge that support the need for further education.

2. Methods

This study was approved by Chesapeake IRB (Columbia, MD). A waiver of written informed consent was obtained.

2.1. Participants

Focus group discussions were conducted with PCP and HR community members. Eligible PCPs had an active license as a physician, nurse practitioner, or physician assistant and were working in a primary care setting in the state of Florida; provided health care to patients over age 55; and reported access to a telephone and computer/tablet. PCP participants received $100. The eligibility criteria for HR participants mirrored USPSTF lung cancer screening criteria. Participants were: between ages 55 and 80, had a 30-pack year smoking history, and were a current or former smoker who quit within the past 15 years [14]. Individuals who had a previous LDCT screening for lung cancer, or were currently undergoing cancer treatment, were excluded. HR participants received a meal and $30.

PCPs were recruited using flyers posted in medical facilities and emails to physician liaison groups. Interested participants called a study telephone number and were screened for eligibility. Providers were scheduled for a 60-min telephone focus group. HR community participants were recruited using newspaper ads, Craigslist, and flyers in local businesses. Eligible community participants who were interested in participating were scheduled for a 1.5 h in-person focus group.

2.2. Focus group procedures

2.2.1. PCP focus groups

Participants were asked about their typical cancer screening recommendations for their patients, then specifically about lung cancer screening (see Fig. 1 for PCP focus group guide). Current evidence was presented by an expert in a webinar format, summarizing the results of the NLST and explaining requirements for reimbursement as well as the positives (e.g., early detection) and negatives (e.g., false positives) of LDCT screening for lung cancer.

2.2.2. HR focus groups

Participants were asked about their beliefs of cancer screening in general, knowledge of LDCT screening for lung cancer, and future intentions to pursue a LDCT screening(see Fig. 2 for HR focus group guide). Participants then viewed two videos on LDCT screening for lung cancer (a national news story and a promotional video from a cancer center) and were asked to discuss perceived benefits and barriers of testing as well as future intentions.

2.3. Data analysis

All focus groups were audio-recorded and verbatim transcripts were created for analysis. Content analysis of the data was conducted using the constant comparative method. We classified the *a priori* themes related to knowledge, acceptability of evidence, confidence, barriers and facilitators to referrals or screening [22]. We grouped responses into categories of *majority*- indicating more than 50% of the respondents endorsed the theme; *some* – indicating 30% endorsement; and *a few* – indicating less than 30% [23].

3. Results

3.1. Primary care providers

PCP participant (N = 23) characteristics are displayed in Table 1. Major themes extracted from the data analyses are presented below. Representative quotes are provided for each theme in Table 3.

3.1.1. Practice behaviors

All providers reported routinely offering traditional cancer screening (mammography, Pap tests, prostate-specific antigen [PSA] discussions, and colonoscopy) to eligible patients. Participants were asked if patients inquired about lung cancer screening and if they recommended it to eligible HR patients. The majority of PCPs stated patients did not inquire about lung cancer screening and they were not recommending LDCT screening. A few PCPs noted that patients' requested chest X-rays for lung cancer screening. The majority of PCP participants stated they had limited knowledge of LDCT screening, however, they said they would recommend it to their patients, if they had more information.