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ORIGINAL PAPER

Issues related to implementing a smoking cessation clinical trial for cancer patients

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Abstract Given high rates of smoking among cancer patients, smoking cessation treatment is crucial; yet limited data exist to guide integration of such trials into the oncologic context. In order to determine the feasibility of conducting smoking cessation clinical trials with cancer patients, screening and baseline data from a large randomized placebo-controlled pharmacotherapy trial were analyzed. Descriptive statistics and regression analyses were used to compare enrollees to decliners, describe program enrollees, and assess correlates of confidence in quitting smoking. Out of 14,514 screened patients, 263 (<2%) were eligible; 43 (16%) refused enrollment. Among the eligible patients, 220 (84%) enrolled. Enrollment barriers included smoking rate, medical history/contraindicated medication, lack of interest, and language. Compared to enrollees, decliners were more likely to have advanced cancer. The trial enrolled a sample of 67 (>30%) African Americans; participants had extensive smoking histories; many were highly nicotine dependent; and participants consumed about seven alcoholic beverages/week on average. Head and neck and breast cancer were the most common tumors. About 52 (25%) reported depressive symptoms. A higher level of confidence to quit smoking was related to lower depression and lower tumor stage. Integrating a smoking cessation clinical trial into the oncologic setting is challenging, yet feasible. Recruitment strategies are needed for patients with advanced disease and specific cancers. Once enrolled, addressing participant's depressive symptoms is critical for promoting cessation.

Keywords Cancer patients · Smoking cessation · Confidence · Feasibility data

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Introduction

Although tobacco use is widely known as a primary cause of cancer, about 30% of cancer patients who smoked prior to their diagnosis continue to smoke [1], and relapse rates among cancer patients are high [2, 3]. Continued smoking by cancer patients can decrease survival time [4], increase risk of developing a second primary tumor [5], reduce the effectiveness of medical treatments [6–11], and diminish patient quality of life by increasing treatment-related complications and side effects [12]. Consequently, there has been growing recognition of the need to integrate smoking cessation treatment programs into the oncologic context [13].

Unfortunately, the availability of smoking cessation treatment programs for cancer patients remains inadequate [14]. In general, the availability of health promotion or cancer prevention services for cancer patients has not met the rising needs of the growing population of cancer survivors [15]. In the context of nicotine dependence, this shortcoming may be due to the limited number of clinical trials that assess treatments for smoking among cancer patients [16]. Indeed, a remarkably small number of

smoking cessation clinical trials have been conducted with cancer patients, and many of the completed trials have been relatively small and under-powered [13].

The slow pace of completing smoking cessation clinical trials for cancer patients may be due to co-morbidities that prevent enrollment as well as the lack of feasibility data, including the rate of accrual. Since most cancer patients who report smoking prior to diagnosis initially quit smoking for some period of time after diagnosis [17], it may be challenging to recruit patients for smoking cessation clinical trials. Additional reasons for the paucity of smoking cessation clinical trials with cancer patients include limited data on: (1) cancer patient characteristics that may serve as a barrier to cessation, and (2) correlates of important predictors of success such as confidence to quit smoking. Based on the self-medication theory of nicotine dependence [18], smoking may continue or patients may relapse to alleviate depressive symptoms. Furthermore, since confidence to quit smoking is a consistent predictor of smoking behavior, a better understanding of the differences between patients who exhibit confidence to quit smoking and those who do not can facilitate the development of effective cessation treatments for these patients [19, 20]. Identifying correlates of quit confidence may allow cessation programs to target patients most in need of assistance, and may help determine the content of effective interventions for cancer patients who smoke.

Documenting the feasibility of implementing smoking cessation clinical trials and programs for cancer patients, understanding the barriers and correlates of trial enrollment, and identifying correlates of quit confidence among cancer patients may help researchers to implement smoking cessation clinical trials with this under-served group of smokers. With the recent FDA approval of the new nicotine dependence medication varenicline, new clinical trials with cancer patients are likely and may benefit from data that can guide efforts to recruit and treat patients. As such, based on recruitment and baseline data from a placebo-controlled double-blind randomized clinical trial of bupropion for cancer patients, the aims of this study were to describe rates of recruitment, characteristics of enrolled patients and reasons for ineligibility, compare trial enrollees to decliners, and identify correlates of quit confidence.

Materials and methods

Study design

The smoking cessation for cancer patients program based at Fox Chase Cancer Center is a randomized, double blind placebo-controlled clinical trial. All patients receive behavioral counseling, nicotine replacement therapy (NRT; the transdermal patch), and are randomized to receive either Zyban (bupropion SR) or placebo for nine weeks. Patients completed five mid-treatment sessions during these nine weeks. For the baseline session, they were asked to come to the hospital, where they received cancer treatment. The baseline session consisted of eligibility screening, a study overview, randomization, and a baseline assessment. For those eligible and interested in the trial, the baseline visit also involved the first counseling session with the health educator. This baseline visit also represented the starting point of the study for enrolled participants. The following two sessions were with the health educator in-person, and the final two sessions were completed over the telephone. After the nine-week treatment period, the patients were evaluated at week 12, 27, and 55. These three follow-up assessments evaluated whether the patients remained quit. The current study represents analysis of data collected during participant recruitment and baseline evaluation.

Participants

With approval from the Institutional Review Boards at each institution, cancer patients at Fox Chase Cancer Center, Temple University Hospital, Thomas Jefferson University Hospital, and the Hospital of the University of Pennsylvania were proactively screened for trial eligibility. Research assistants evaluated patient eligibility using electronic medical records. If eligibility could not be determined through the medical record, the research assistant contacted the patient by telephone to determine eligibility. To be eligible, patients had to be at least 18 years of age, speak English, possess a telephone, smoke at least two cigarettes a day on average, and have a diagnosis of head, neck, colorectal, stomach, cervical, ovarian, kidney, bladder, prostate, lung, esophageal, testicular, thyroid cancer, or lymphoma. Participants who screened ineligible, participants who screened eligible but declined to join the program, and patients who screened eligible and enrolled in the program were included in the present analyses.

Patients were excluded if they reported no current smoking; had stage IV pancreatic, liver, kidney, stomach, or lung cancer, or had brain metastases; reported current drug or alcohol dependence (except nicotine) assessed by the Mini International Neuropsychiatric Interview [21]; reported current Axis I psychiatric conditions assessed by the Mini International Neuropsychiatric Interview [21]; were pregnant or lactating; reported a history of seizure disorder, serious or unstable cardiac, renal, hypertensive, pulmonary, endocrine, or neurological disorders; reported current use of an MAO inhibiter or a pharmacologic treatment for nicotine dependence (e.g., fluoxetine); and reported recent discontinuation of benzodiazepines.

Study procedures

Clinical and demographic data were collected as part of the screening process. Ineligible patients were given smoking cessation information if appropriate and if requested. Eligible patients were scheduled for an in-person medical screening appointment. If eligible, patients completed informed consent and HIPAA documents, proceeded to a baseline evaluation, and enrolled onto the trial. Participant randomization to treatment arms was double-blinded and stratified by level of depressive symptoms.

Measures

Feasibility

Feasibility was measured by assessing the rate of eligible patients who agreed to enroll in the smoking cessation program. The total number of patients screened and considered eligible was compared to the total number of patients, who were enrolled. Reasons for ineligibility were assessed as a means of examining barriers to program eligibility. Program retention was also assessed (i.e., proportion of patients enrolled who were retained in the trial). Although a priori cut-offs for determining study feasibility based on accrual and retention rates were not established, we considered the study feasible if at least 50% of the eligible participants enrolled in the study, and at least 80% of enrolled participants remained in the study through to the final follow-up evaluation at week 55.

Demographic characteristics

Prospective participants completed a measure to assess baseline characteristics such as age, gender, education, family income, race, and ethnicity.

Disease-related characteristics

For all prospective participants, clinical data concerning tumor type and stage were ascertained from electronic health records. These records are based on pathology reports that conform to established standards of cancer staging.

Smoking-related characteristics

For enrolled participants, data on current and past smoking behavior were assessed, including age at which patients started smoking, years smoked, current smoking rate, and level of nicotine dependence measured by the 6-item, self-report Fagerström Test for Nicotine Dependence (FTND) [22]. The FTND is scored with a range of 0 to 10 with higher scores indicating greater nicotine dependence. Scale scores are subsequently categorized into very low (0–2), low (3–4), medium (5), high (6–7), or very high (8–10). The 10-item reasons for smoking scale [23] assessed use of tobacco to alleviate negative affect (e.g., "When I feel uncomfortable or upset about something, I light up a cigarette"). Participants were classified as self-medicators (i.e., smokes to alleviate negative affect) versus non-self-medicators (i.e., does not smoke to alleviate negative affect) based on median scores on the sum of the 10-item scale. This scale has been associated with level of nicotine dependence, has been shown to be a mediator between depression and smoking, and has been shown to be related to response to pharmacotherapies for nicotine dependence [24–26].

Affect

For enrolled participants, two measures of affect were administered to ensure assessment of a broad measure of affect that included a positive dimension. The Center for Epidemiologic Studies Depression Scale (CES-D) [27] is a 20-item Likert measure used previously to assess depressive symptoms among cancer patients [28]. The scale possesses strong internal consistency reliability and is a valid predictor of clinical depression [27]. A score of 16 or greater indicates clinically relevant symptoms of depression. The Positive and Negative Affect Scale (PANAS) [29] was used to assess positive (e.g., enthusiasm) and negative (e.g., distressed) mood. The 20 self-report items yield two subscales that have shown high internal consistency and construct validity [29]. Norms with clinical populations are not available for the PANAS.

Confidence to quit smoking

For enrolled participants, a single face-valid measure of confidence to quit smoking was used. The item, assessed using a 10-point Likert-type scale, read: "How confident are you that you will be able to quit smoking if you decide to quit?". This measure developed from motivational interviewing [30] has been widely used in the addiction field [31].

Data analysis

First, descriptive statistics (e.g., frequency distributions) were used to characterize study feasibility and reasons for study ineligibility. Second, chi-square tests and ANOVA were used to compare trial enrollees to trial decliners in terms of available data (e.g., age, race, and tumor stage). Third, descriptive statistics were used to characterize program enrollees (e.g., frequency distributions). Established cut-offs [27], or cut-offs used in previous studies [20], were used to classify participants along specific dimensions (e.g., depression). For scales without established cut-offs,

the continuous value for the scales was used and reported (e.g., PANAS). Lastly, Pearson r (for continuous measures) and ANOVA (for categorical variables) were used to evaluate factors associated with confidence to quit smoking. Factors found to be correlated with confidence to quit smoking ($p \leq .10$) were entered into a multiple linear regression analysis predicting confidence to quit smoking to control for type I error.

Results

Feasibility

Participants were recruited from October 2002 until July 2007. In total, 14,514 patients were screened for this trial. Out of this total, 14,251 (98%) were found to be ineligible, and 263 (<2%) were eligible. Out of the 263 eligible participants, 43 (16%) refused enrollment, and 220 (84%) patients enrolled. Figure 1 illustrates reasons for ineligibility in non-overlapping categories. Patients found to be ineligible during screening were ineligible primarily because they: did not currently smoke cigarettes (83%; $n = 11{,}823$); were smoking fewer than 2 cigarettes a day (0.3%; $n = 43$), on average, the cut-off for the study; reported a contraindicated medical condition such as, a serious cardiovascular problem (5%; $n = 713$) or a contraindicated medication for bupropion (1%; $n = 143$); were not interested in quitting smoking (4%; $n = 571$); passed away prior to assessment (0.8%; $n = 114$); did not speak English (0.7%; $n = 100$); lived too far from participating hospitals (0.7%; $n = 100$); or reported a current psychiatric condition (0.1%; $n = 14$). Lastly, although the trial is ongoing, the rate of retention in the study through to week 55 is 84.5% (34 out of 220 patients withdrew from the trial).

Factors related to enrolling

Patients who enrolled were compared to patients who declined the program in terms of available demographic and medical data (Table 1). There were no significant differences in enrollment status between men versus women, Caucasian versus African American patients, or Hispanic versus non-Hispanic patients ($p > .05$). Age was also not associated with enrollment state ($p > .05$). In contrast, tumor site was related to enrollment status ($\chi^2[4] = 12.4$, $p < .05$), with patients classified into the "other" category (e.g., bladder, cervical, colorectal, kidney, lymphoma, and ovarian) showing a higher rate of refusal to enroll into the smoking cessation study, compared to head and neck, lung, breast, or prostate cancer patients[1]. In addition, enrollees reported a lower tumor stage compared to decliners ($F[1, 197] = 3.88$, $p < .05$).

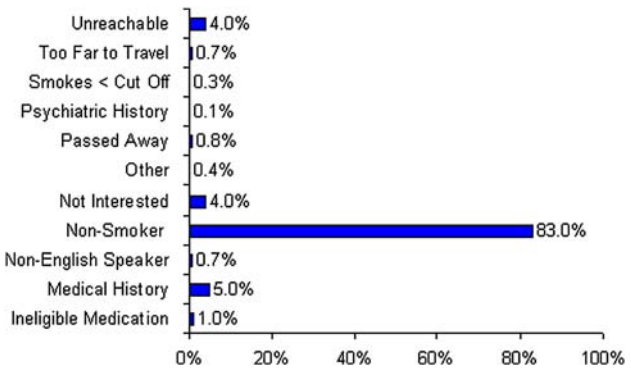

Fig. 1 Frequency distribution of ineligible reasons

Table 1 Comparison of program enrollees and decliners ($n = 263$)

Characteristic	Enrollees ($n = 220$) n(%) or mean(SD)	Decliners ($n = 43$) n(%) or mean(SD)	df	F or χ^2
Demographic variables				
Gender			1	0.001
Male	113 (51)	22 (51)		
Female	107 (49)	21 (49)		
Race[a]				
African American	67 (31)	16 (42)	1	1.7
Caucasian	148 (69)	22 (58)		
Ethnicity[a]			1	0.17
Hispanic	9 (4)	1 (3)		
Non-hispanic	208 (96)	35 (97)		
Age	55.8 (10.9)	55.3 (13.8)	1,261	0.8
Medical variables				
Tumor site			4	12.4[b]
Head and Neck	46 (21)	4 (10)		
Lung	34 (15)	7 (17)		
Prostate	35 (16)	5 (12)		
Breast	48 (22)	4 (10)		
Other	57 (26)	21 (51)		
Tumor stage[c]	2.0 (.92)	2.5 (1.0)	1,197	3.88

Note: [a] Indicates exclusion of non-Caucasian or African American ($n = 10$); [b] indicates $p < .05$; [c] indicates tumor stage could not be determined at the time of analysis ($n = 64$)

Characteristics of enrolled patients

Table 2 displays the characteristics of patients who enrolled in the smoking cessation program. Notably, we were able to recruit 67 African American cancer patients for this smoking cessation clinical trial (31%). Most enrollees were

[1] We also examined tumor site in terms of tobacco related [head and neck and lung cancer] versus other and did not find that this variable was related to enrollment status.

Table 2 Characteristics of program enrollees ($n = 220$)

Variable	*n* or Mean and range	% or SD
Sex		
Male	113	51
Female	107	49
Race		
African American	67	31
Caucasian	148	67
Asian	1	0.5
Other	4	2
Ethnicity		
Hispanic	9	95
Non-Hispanic	208	4
Marital Status		
Single	45	21
Married	118	54
Divorced	31	14
Separated	7	3
Widowed	19	9
Income		
<$15,000	39	18
$15,000-$29,999	46	21
$30,000-$49,999	48	22
$50,000-$74,999	37	17
$75,000-$99,999	23	11
>$100,000	12	5
Education		
<8 years	6	3
8–11 years	29	13
High school	78	36
Vocational/technical	12	5
Some college	51	23
BA	27	12
Graduate or Post-graduate	16	7
Job status		
Work full time	82	37
Work part time	30	14
Unemployed, looking	5	2
Unemployed, not looking	11	5
On disability	37	17
Retired	55	25
Age	55.8 (21–81)	10.9
Tumor site		
Lung	34	22
Head and neck	46	21
Breast	48	15
Prostate	35	16
Other	57	26
Tumor stage		
Localized	71	32
Regional	65	30
Metastatic	51	23
Number of alcoholic drinks per week	6.7 (0–50)	10.8
Age started smoking	16.7 (8–48)	4.5
Number of years smoked	38.2 (3–67)	12
FTND		
Very low	19	9
Low	53	24
Medium	38	17
High	77	35
Very high	25	11
Depression symptoms		
Yes	52	24
No	160	73
Negative effect	18.1 (10–42)	7.6
Positive effect	33.5 (14–49)	7.4
Self-medication (reasons for smoking scale)		
Yes	111	50.5
No	104	47.3

Note: Categories may not sum to 220 because of missing data (<5%)

married ($n = 118$; 54%), earned at least $30,000-$49,000 ($n = 120$; 55%) annually, completed at least high school ($n = 185$; 83%), and were employed ($n = 112$; 51%). On average, participants were 55.8 years of age (median = 56). Almost three-quarters ($n = 163$) of program enrollees were diagnosed with either lung, head and neck, prostate, or breast cancer (74%), and tumor stage was fairly evenly distributed. Program enrollees had relatively extensive smoking histories, starting to smoke, on average, at the age of about 17-years and smoking for almost 40 years. Almost half the sample ($n = 102$; 46%) reported high or very high levels of nicotine dependence as measured by the FTND. Program enrollees also reported consuming, on average, close to seven alcoholic beverages each week. Lastly, close to one-quarter of program enrollees ($n = 52$) showed clinically relevant symptoms of depression as measured by the CES-D.

Correlates of confidence to quit smoking

Pearson correlation analysis between the measure of confidence to quit smoking and demographic variables (i.e., age, income, education, and marital status), smoking-related characteristics (e.g., age started smoking, years

Table 3 Summary of multivariate linear regression analysis predicting confidence in quitting

Predictor variable	B	*t*	*p*
Income	−0.092	−1.06	0.29
CES-D	−0.163	−2.03	0.04
FTND	−0.104	−1.3	0.19
Positive affect	0.078	0.99	0.32
Tumor stage	−0.162	−2.11	0.04
Race	−0.15	−1.79	0.09

Note: Race classified as African American (0) versus Caucasian (1); self-medication was excluded from the model since it was highly collinear with depressive symptoms. The CES-D is the total score [continuous]

smoked, duration of previous cessation, and FTND), psychosocial variables (i.e., depression, self-medication, and negative and positive affect), and clinical variables (i.e., tumor stage) indicated that higher levels of confidence to quit smoking were associated with: lower income ($r = –0.15$, $p < 0.05$), fewer depression symptoms ($r = –0.16$, $p < 0.05$), lower self-medication scores as indicated by the Reasons for Smoking scale ($r = -0.23$, $p < 0.001$), higher positive affect scores ($r = 0.13$, $p < 0.06$), lower levels of nicotine dependence ($r = -0.19$, $p < 0.05$), and lower tumor stage ($r = -0.12$, $p = .10$). A one-way ANOVA showed that African American patients reported higher levels of confidence to quit smoking ($M = 7.6$), compared to Caucasian patients ($M = 6.4$; $F[1,211] = 14.6, p < .05$). Sex, ethnicity, marital status, and tumor type were not associated with confidence to quit smoking. Lastly, a multivariate linear regression, with level of confidence to quit smoking as the dependent variable and variables found in the bivariate analysis to be related to quit confidence as predictors, was conducted (Table 3). Controlling for other variables in the model, the results of this analysis indicated that patients who reported greater confidence to quit smoking tended to also report significantly lower levels of depressive symptoms and lower tumor stage (Table 3).

Discussion

This study was designed to provide data on the feasibility of recruiting cancer patients for a smoking cessation pharmacotherapy clinical trial, describe reasons for trial ineligibility, compare enrollees to decliners, describe program enrollees, and assess correlates of confidence to quit smoking, an important predictor of smoking behavior among cancer patients. The results offer useful information for the planning and implementation of smoking cessation clinical trials or programs at comprehensive cancer centers or major medical centers for cancer patients.

Based on criteria established in this paper (i.e., accrual of eligible patients greater than 50% and retention greater than 80%), the clinical trial was challenging, yet feasible. About 84% of eligible patients enrolled in the trial, and program retention exceeded 80%, indicating that most eligible patients will consent to enrollment and will remain on a clinical trial. However, over 14,000 patients were screened to recruit only 220 enrollees. This demonstrates the great amount of time and effort required to obtain a reasonable sample. The following recommendations may enhance recruitment and reduce the low yield from screening. First, many patients were excluded because they did not smoke "enough." Since cancer patients may be more likely to be "chippers" (i.e., occasional smokers), using standard smoking rate for inclusion excludes many patients, who might otherwise benefit. Future cessation trials should use alternative eligibility criteria concerning smoking status, such as smoked at least one cigarette in the past 30 days. In addition, systems to allow for the continual assessment of patient smoking behavior can help streamline recruitment efforts of patients who may relapse months after initial screening. Second, novel intervention approaches may motivate patients to enroll. Four percent of patients who were smokers refused study entry. Motivational interviewing or some alternative technique to promote interest in cessation may be needed for this group of patients. Third, telephone counseling or home visits by research personnel may overcome distance as a barrier to enrollment. In addition, the number of clinic visits should be minimized to enhance enrollment and retention. Fourth, implementing a multi-language counseling format, specifically in Spanish, for self-help materials and in-person counseling, may enhance enrollment. While this issue may only apply to large urban centers currently, the ever changing demographics and growing percentage of minority groups in the United States suggest that overcoming the language barrier to program enrollment will be relevant for most clinical trials. Lastly, pharmacotherapies that have relatively fewer medical contraindications could be used. A substantial number of patients were excluded because they had a conflicting medical condition or took a medication contraindicated by bupropion. Since NRT or varenicline have fewer medical contraindications, their use may translate into a lower proportion of ineligible study participants.

While the comparisons between enrollees and decliners yielded few differences, the sub-group of patients that included a heterogeneous mix of tumor sites, and patients who had a more advanced disease were less likely to enroll in the trial. Patients with tumor sites not typically associated with tobacco use (e.g., kidney, ovarian, and testicular) may be less concerned with continued smoking and less inclined to enroll in a smoking cessation trial. Patients with

a more advanced disease may be less likely to enroll in a smoking cessation clinical trial since they may perceive that their disease course will be unaffected by cessation or continued smoking, although this interpretation will need to be verified in future studies. They may also have demanding co-morbidities that diminish their energy or desire to enroll on a smoking cessation trial, but this interpretation also requires future assessment to determine. In this trial, we did not measure patient perceptions regarding survival. Thus, we do not know, for certain, if patients with an advanced disease perceived their diagnosis to be hopeless and, thus, considered smoking cessation inconsequential. Overall, recruitment efforts may be important for patients with tumors that are not traditionally considered to be related to smoking and sub-groups of patients with a more advanced disease.

Assessment of the characteristics of enrolled patients indicates that it is feasible to accrue a substantial proportion of African American cancer patients into smoking cessation clinical trials. Our partnership with Temple University Hospital, which serves a primarily African American community, was largely responsible for this important accomplishment. African Americans remain largely underserved by cancer clinical trials and smoking cessation clinical trials [32]. Partnerships between comprehensive cancer centers and inner-city medical centers may help overcome these barriers to access. Furthermore, patients who enroll in such trials are likely to have extensive smoking histories, show high levels of nicotine dependence, and report relatively high levels of alcohol consumption, all important barriers to cessation [33, 34]. Likewise, a substantial proportion of patients enrolling in smoking cessation clinical trials are likely to show clinically-relevant levels of depressive symptoms, another important barrier to successful smoking cessation among cancer patients [19] and the general population of smokers [35]. As smoking cessation treatment programs are devised for cancer patients, these characteristics should be considered to enhance the likelihood for success for patients who enroll.

Finally, analysis of correlates of confidence to quit smoking, an important predictor of smoking behavior, indicated that patients with higher depression symptoms and a more advanced disease stage showed lower confidence to quit smoking. Depressed patients may have experienced previous failures with attempts to quit smoking that reduces confidence. Indeed, in the current sample, we found some indication that this may be the case: depressed patients reported a significantly shorter duration of past smoking cessation ($M = 108$ days), versus non-depressed smokers ($M = 296$ days; $F[1,199] = 3.85$, $p < .05$). Depressed smokers may perceive *a priori* their greater susceptibility to relapse which, in turn, may translate into a lower sense of self-confidence to achieve sustained cessation. Likewise, patients with a more advanced disease may report lower levels of quitting self-confidence, since, they consider smoking cessation less relevant, given their potential perception of a lower chance for survival. Regrettably, we did not evaluate risk perceptions of survival, and so we can only speculate about a possible explanation for the relationship between tumor stage and self-reported confidence to quit smoking.

These results should be considered in the context of study limitations. First, the data used were cross-sectional, and all analyses should be considered descriptive and hypothesis-generating. While these data help to fill an important gap in the literature concerning the design and implementation of smoking cessation clinical trials for cancer patients, additional studies are warranted to extend the current study. Second, since the objectives of this study were post-hoc to the main clinical trial, we were limited by the type of data that we could collect for these analyses. Future studies that consider a priori research questions about recruitment issues and patients' self-confidence to quit smoking are needed. Third, it was difficult to verify patients' self-reported smoking status during screening; indeed, many potential participants were only screened by phone. Thus, it is plausible that a sub-set of patients who self-reported to be non-smokers were actually smokers and could have been eligible for this study. Nevertheless, data suggest that less than five percent of patients misrepresent their smoking status [36]. Therefore, even though biochemical verification was not used during the screening process, it would likely have had a relatively minor impact on the results.

Despite these shortcomings, our study may help to guide the development and implementation of smoking cessation clinical trials into the oncologic context. The results could be useful for enhancing the rate of recruitment into such trials and include treatment components that enhance patient self-confidence to quit smoking. Such efforts may help broaden access for cancer patients and survivors to critical preventative health services, thereby contributing to the trend for improved overall clinical outcomes for these patients.

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