Peer Review File

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Reviewer A

Comment 1: Methods: The overview section confuses me, please state in more detail what the setting of the trial was, since the authors in this paper apparently present data that was gathered before randomization to another trial? – please clarify. The interventions applied are properly described.

Reply 1: Thank you for this feedback. The data presented in this paper are from the first two assessments in a randomized trial comparing a telephone-based smoking cessation intervention to usual care within the context of lung cancer screening. The current paper presents data collected at the two assessments that were conducted pre- and post-lung cancer screening. Both assessments were conducted prior to randomization. We have clarified the details from reference #15 (Taylor et al. 2017).

Changes in the text: Lines 76-78: Individuals who had registered to undergo LCS and who were currently smoking were invited to enroll in a randomized trial comparing a telephone-based smoking cessation intervention to usual care, described in a separate paper (15).

Comment 2: Results: Very few participants in the study. I guess it is the same data that are presented in ref 14 concerning the patient characteristics? The main result is that 23,3% of the patients reported smoking fewer CPD (based on a categorical variable and depicted in figure 2) and 17,2% had a readiness to quit. This was based on data collected 12,5 days (median) after screening.

Reply 2: The reviewer is correct that the data included are from the same dataset as utilized in reference 14 (revised reference 15), with the exception of 5 participants who did not complete the pre-LCS assessment, as described in lines 140-142.

Changes in the text: Line 135: To clarify that the data are from the same source, we have added reference 14 (revised reference 15) at the end of the first sentence in the Results section. Please also note the clarification provided under Comment 1 above.

Comment 3: Discussion: Needs to be elaborated. What do the authors think is the distribution of the parameters assessed here in a population, where no intervention is done – ie. Is the data presented merely an expected distribution among individuals who have undergone LCS. What is the effect? This needs to be discussed since there is no control group. Moreover, I find that the post screen follow-up is very short or that another follow-up intervention should have been applied, but maybe that would collide with data presented elsewhere (ref 14)? Should be stated as a limitation.

Reply 3: We thank the reviewer for these comments. These results describing the change in CPD and readiness to quit from pre- to post-lung cancer screening are relevant to individuals who smoke, who have registered to undergo LCS, and who have agreed to enroll in (but have not yet begun) a cessation trial. These analyses do not address what might occur among individuals undergoing LCS who are not enrolled in a cessation trial nor among individuals who are not

undergoing LCS. The questions asked in this paper are important given that there are millions of current smokers around the world who meet the criteria for LCS and who can benefit from this potential 'teachable moment' that can occur following LCS, particularly when paired with the offer of evidence-based tobacco treatment. We are unaware of large observational studies in which individuals undergoing LCS were not also enrolled in a trial (i.e., a screening trial or a cessation trial) and thus cannot comment on how they may respond in this situation. We have noted this as a limitation in the Discussion.

We agree that the post-screen follow-up is short. It was designed to assess whether there is a 'teachable moment' in which motivation or behavior is changed shortly following LCS and can then be capitalized on by providing tobacco treatment. The reviewer is correct that the next participant contact that occurred was part of the randomized trial and therefore could not be used as a longer assessment for this analysis. This is noted as a limitation in the Discussion.

Changes in the text: Lines 226-228: "…. the brief follow-up period, and the need to assess whether the results are generalizable to individuals undergoing LCS who are not enrolled in a cessation trial."

Comment 4: All in all, there are some limitations that need to be handled/commentated further upon by the authors, before suitable for publishing. On the other hand the findings and the short comings of the present study should motivate further studies within this very important field. This in spite of the short follow-up and limited sample size.
Reply 4: We thank the reviewer for the helpful feedback. We have addressed the limitations noted in the above comments.
Changes in the text: None.

Reviewer B
Comment 1: Does the impact of the CT for lung cancer screening make a difference?
Reply 1: We thank the reviewer for this question related to the impact that CT lung screening may have on patients' smoking-related behavior. In the introduction and in the discussion, we have noted that there have been conflicting findings regarding the impact of CT screening on smoking-related behaviors, therefore warranting additional research in this area.

Prior literature has suggested that undergoing CT lung screening, apart from receiving the results of that screening, may or may not have an impact on the psychological and behavioral outcomes associated with smoking. Some research has found that undergoing CT lung screening results in reduced smoking (e.g., Tammemagi 2013;; Taylor et al., 2007; Brain et al., 2017), whereas other research has not found this relationship (Park 2013; Park 2014; van der Aalst 2010).
Changes in the text: Lines 66-70: Indeed, LCS may provide an opportunity to leverage increased motivation to quit by offering cessation interventions, and some studies have shown that LCS is associated with abstinence or readiness to quit (7-10). However, as not all studies have found these associations (11-14), further study regarding smoking behavior in the LCS setting is warranted.

Comment 2: Would there be similar numbers expected from smoking cessation ordinarily? Ie, what is the baseline impact of smoking cessation? Why would simply the act of undergoing a CT scan change their baseline willingness to quit?

Reply 2: We believe that the first two questions are addressed above under Reviewer A, Comment 3. In addition, we have modified the discussion to further address the conflicting findings in the literature.

Regarding the third question, "Why would simply the act of undergoing a CT scan change their baseline willingness to quit?", we have noted the following in the introduction, "The time frame immediately surrounding LCS may serve as a "teachable moment" in which smokers have heightened awareness of health risks associated with smoking, increased motivation to stop smoking, and increased perceived risk for lung cancer." We have added a reference to this statement (McBride 2003) and we have made the modifications below in the discussion section.

Changes in the text: Line 66: We have added the McBride 2003 reference (6).

Lines 186-191: However, other studies do not support these findings (11-14), possibly due to a longer post-screening window in which assessments occurred, suggesting that motivation to reduce or stop smoking can quickly dissipate. Moreover, undergoing LCS in and of itself may not impact abstinence (23), which was also suggested by the low number of individuals who quit immediately following LCS in the present study. However, the changes in amount smoked and readiness to quit, along with the provision of cessation resources, may encourage progression toward quitting in this setting.

Lines 230-235: "These short-term changes in cigarettes per day and readiness to quit suggest that proactive and intensive cessation interventions will be needed to capitalize on the potential "teachable moment" of LCS. This is a period in which clinicians have an opportunity to educate patients on the harms of continued smoking in the context of LCS and receipt of results, as well as to connect patients with access to cessation resources, regardless of their interest in quitting following LCS."

Comment 3: Would some patients be emboldened by negative screen results and continue smoking 'guilt free'?

Reply 3: There is little research to suggest that negative results encourage continued smoking. As noted in the introduction and discussion, studies have instead found that LCS is associated with abstinence or readiness to quit or have found no association between screening results and smoking, suggesting that further study regarding smoking behavior in the LCS setting is warranted. In either case, it is important to highlight the benefits of cessation and to provide tobacco treatment regardless of screening result to reduce future risk of lung cancer and other tobacco-related illnesses.

Changes in the text: Lines 230-235: These short-term changes in cigarettes per day and readiness to quit suggest that proactive and intensive cessation interventions will be needed to capitalize on the potential "teachable moment" of LCS. This is a period in which clinicians have an opportunity to educate patients on the harms of continued smoking in the context of receiving

the LCS results, as well as to connect patients to cessation resources, regardless of their interest in quitting following LCS.

In sum, we greatly appreciate the comments and suggestions provided by the reviewers. We have addressed these comments and believe that these suggestions have improved the paper. We thank you for further consideration of this manuscript and look forward to your response.