

Smoking cessation in lung cancer screening: can a smartphone help?

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There is compelling evidence that the most effective strategies to reduce lung cancer mortality are smoking cessation and low-dose chest computed tomography (LDCT) screening.¹ Both US guidelines and European statement papers advocate for the integration of smoking cessation into clinical and research protocols for lung cancer screening.^{2,3} Participation in LDCT lung cancer screening can serve as a “teachable moment,” potentially increasing awareness of smoking risks and receptivity to smoking cessation interventions among heavy smokers and/or those with high nicotine dependence.⁴ A combined approach of lung cancer screening and smoking cessation has been shown to maximize benefits and enhance cost-effectiveness of the screening programmes.⁵ Nevertheless, a significant knowledge gap exists regarding the optimal type, modality, timing, and communication content of a smoking cessation program within the context of lung cancer screening. While various scientific initiatives have produced conflicting results in developing protocols and conducting studies to further explore this topic,⁶ systematic reviews have yet to identify an optimal approach due to insufficient data.⁷

In this issue of *The Lancet Regional Health-Europe*, Livanainen et al.⁸ examined whether a newly developed smartphone application would be more effective than written material in promoting smoking cessation and reduction, among 200 current smokers who met the NELSON trial criteria (i.e., aged 50–74 years, with a smoking history of ≥ 15 cigarettes/day for ≥ 25 years or ≥ 10 cigarettes/day for ≥ 30 years) for LDCT lung cancer screening at a single center in Finland. Participants were randomized in a 1:1 ratio, stratified by pack-years (30 py cut-off) and age (65 years cut-off), resulting in study and control groups well-balanced in terms of age, gender, technology skills, smoking history, and nicotine dependence. The authors found that the smartphone application threefold the likelihood of achieving self-reported smoking cessation at three and six months compared to written material. Additionally, they observed a higher, albeit not statistically significant, frequency of smoking reduction ($\geq 50\%$ from baseline) in the application group at three months, but not at six

months. The application appeared to be more effective among older smokers (≥ 65 years), females, and those with a heavier smoking history (≥ 30 py). Smokers who quit demonstrated higher rates of application use, and the effect on smoking cessation was independent of Nicotine Replacement Therapy (NRT) use. The smoking cessation rates observed in this trial (19.8% and 18.8% vs. 7.1% and 7.4% at three and six months, in the study vs. control group, respectively) align with those observed among smokers who quit during the LDCT lung cancer screening study period (up to four years) across various studies (i.e., 7–23%).⁷

Despite being observed in a small study sample from a single center, followed over a short six-month period, and lacking biochemical validation, these results provide a first RCT-based preliminary evidence supporting the efficacy of a smartphone application as a novel aid for tailored smoking cessation interventions specifically in LDCT lung cancer screening. Given the widespread use of mobile devices, the developed application could be more accessible and engaging than written material, even among the elderly. Therefore, the proven effectiveness of a smartphone application, mirroring the results shown for automated digital interventions as opposed to self-help guidelines,⁹ suggests the potential for a cost-effective approach that could preserve both human and service resources that would otherwise be allocated to smoking cessation in lung cancer screening. The study's findings help identify the subpopulations for which such an intervention appears most effective. Overall, this experience could be useful when considering testing the smartphone application in other oncologic screening or clinical settings where current smokers could potentially be prompted to quit. Even better results might be expected by adding pharmacological support to the use of the developed application. Systematic reviews and meta-analyses of a small number of trial participants using both pharmacotherapy and smartphone intervention¹⁰ have demonstrated additional benefits in smoking cessation rates, indicating a need for further research in the LDCT lung cancer screening context. In the meantime, smokers undergoing lung cancer screening may be encouraged to use their smartphone as a tool to help in quitting smoking.

Contributors

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Declaration of interests

The authors have no conflicts of interest to declare.

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