

Early View

Research letter

Impact of the UK lockdown on people at risk of COPD

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Impact of the UK lockdown on people at risk of COPD.

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To the Editors,

On 23 March 2020, the UK Government announced a nationwide lockdown in response to the COVID-19 epidemic with people banned from leaving their homes except for essential journeys and exercise.

From the beginning, public health advice issued by the UK National Health Service (NHS) encouraged smokers to quit. This advice was based on studies that showed a five time greater risk infection of the respiratory tract by the influenza virus in smokers, and that bacterial infection/pneumonia is twice as likely in those who smoke (1, 2). Early data during the pandemic was inconclusive as to whether tobacco smoking or nicotine conferred increased susceptibility to COVID-19 infection or not, but infected smokers had poorer clinical outcomes (3).

Whether people living in the UK took the public health advice is unclear as mass survey data are contradictory. One early cross-sectional survey suggested that 12.2% of those who tried to quit in the 3 months prior to March 2020 were motivated by COVID-19 but this was not statistically tested (4). Data from another survey during April 2020 showed no significant change in smoking behaviour, with 15.9% of people sampled smoking in the year prior to February 2020 compared to 17.0% of people surveyed in April 2020 (5). Whilst another survey suggested that smokers were stress-smoking more since the pandemic (6). Our aim was to describe smoking and other behaviours during a nationwide lockdown.

Participants enrolled in the British Lung Foundation (BLF) Early COPD cohort were aged 30-45 years, current tobacco smokers with >10 pack-year smoking history, $FEV_1 \geq 80\%$ predicted and a $BMI < 35\text{kg/m}^2$. They were scheduled to be seen face-to-face in clinic every 6 months for measurement of full lung function, completion of various questionnaires, and physical collection of blood and sputum samples but during lockdown telephone interviews were performed and written questionnaires returned as photographs attached to e-mails. Remote interviews took place between 16 April and 28 September 2020 and paired with the closest pre-pandemic visit.

By telephone, participants were asked about smoking habits, upper and lower respiratory tract infections (URTI and LRTI). They were also sent the COPD Assessment test (CAT), Leicester cough questionnaire, Hospital Anxiety and Depression questionnaire and questions 1 and 2 of the St. Georges Respiratory Question for diagnoses of chronic bronchitis (CB) (7, 8). Twenty-seven participants did not return the questionnaires. Statistical comparisons were made by paired t-test or Wilcoxon matched pairs test; comparisons between groups were made by Mann-Whitney and Chi-squared tests as appropriate. Remote telephone visits were approved by a non-substantial amendment to the ethics approval (London-Riverside Research Ethics Committee (16LO2041)).

Data were obtained during lockdown between the 16 April and 25th Sept 2020 from 260 individuals (25 Belfast, 38 Birmingham, 25 Edinburgh, 101 London, 27 Manchester and 44 Nottingham). The average age was 38.1 years (SD 4.6, n=259); 155 (59.6%) were male and the post-bronchodilator FEV₁ at enrolment was 3.81 (SD 0.8) litres, 101% (SD 11) of Global Lung-function Initiative (GLI) predicted. The interval between the two visits was 196 days (IQR 80-238).

Figure 1 demonstrates that during lockdown, the proportion of participants recorded as having stopped smoking for at least a week doubled from 31/259 (12.0%) prior to lockdown to 62/259 (23.9%; chi-squared $p<0.001$) during lockdown. Smoking habit data were available at both visits for 258 participants; 40 has stopped, 9 restarted and 209 participant's habits were unchanged. Of these 209, 187 continued to smoke and 22 had already quit. In those who smoked before and during lockdown, assessed over the 7 days preceding each visit, tobacco consumption (Wilcoxon cigarettes per day; $p=0.587$) and (rolling tobacco, g/week; Wilcoxon $p=0.924$) was unchanged.

During lock-down, the anxiety component scores increased from 6.7 (SD 4.4) to 7.4 (SD 4.7, n=233; t-test $p=0.010$) and depression scores increased from 4.30 (3.9) to 5.14 (SD 4.1; n=233; t-test $p<0.001$). Anxiety increased in 78/233 and depression in 89/233 participants by 2 or more units, the minimally important difference in COPD (9).

Respiratory symptoms improved during lockdown, with CAT scores falling from 9 (IQR 6-15) to 8 (IQR 5-13; n=233; Wilcoxon $p=0.008$) and the total Leicester cough score indicating improvement as it increased from 19.7 (IQR 17.6-20.6) to 20.0 (18.7-20.8; n=204; Wilcoxon $p=0.045$).

A comparison of the 40 patients who quit during lockdown with those 187 who smoked at both visits showed no difference prior to lock down in CAT scores (Mann-Whitney $p=0.814$) or in the

prevalence of chronic as bronchitis defined by the SGRQ (chi-squared $p=0.607$). However, after quitting, CAT scores were lower (5 (IQR 3-13) compared with 9 (6-13) in smokers (Mann-Whitney $p=0.0307$) and chronic bronchitis less prevalent (4/34 (11.8%)) than in those who continued to smoke (47/167 (28.1%; chi-squared $p=0.045$)).

The number of upper respiratory tract infections recalled by the participants fell from a median of 1 (IQR 0-2; group mean=1.24) when asked pre-pandemic to a median 1 (IQR 0-1; group mean 0.84; Wilcoxon $p=0.0002$) when asked during lock-down. There was no difference in the number of lower respiratory tract infections; Wilcoxon $p=0.192$.

In summary, during the UK national lockdown and a period of enforced social distancing, there was a significant increase in the proportion of 30–45-year-old smokers who quit smoking despite increased levels of depression and anxiety. It has been reported that depressed individuals are more likely to be nicotine dependent, but paradoxically, older depressed adults coupled with health concerns are more motivated to quit (10). Stress may have enhanced lockdown as an important moment at which to quit. One limitation in our study is the absence of objective measures of nicotine use. However, participants who self-reported that they had quit smoking, had a reduced prevalence of chronic bronchitis and lower CAT scores that's suggests they were truthful about their habits. There was also a reduced number of URTI infections again suggestive that participants had fewer social interactions and opportunities for cross-infection.

Our findings suggest that any evaluation of the health response to the pandemic needs to balance deterioration in mental health in specific age groups with improvements in respiratory health.

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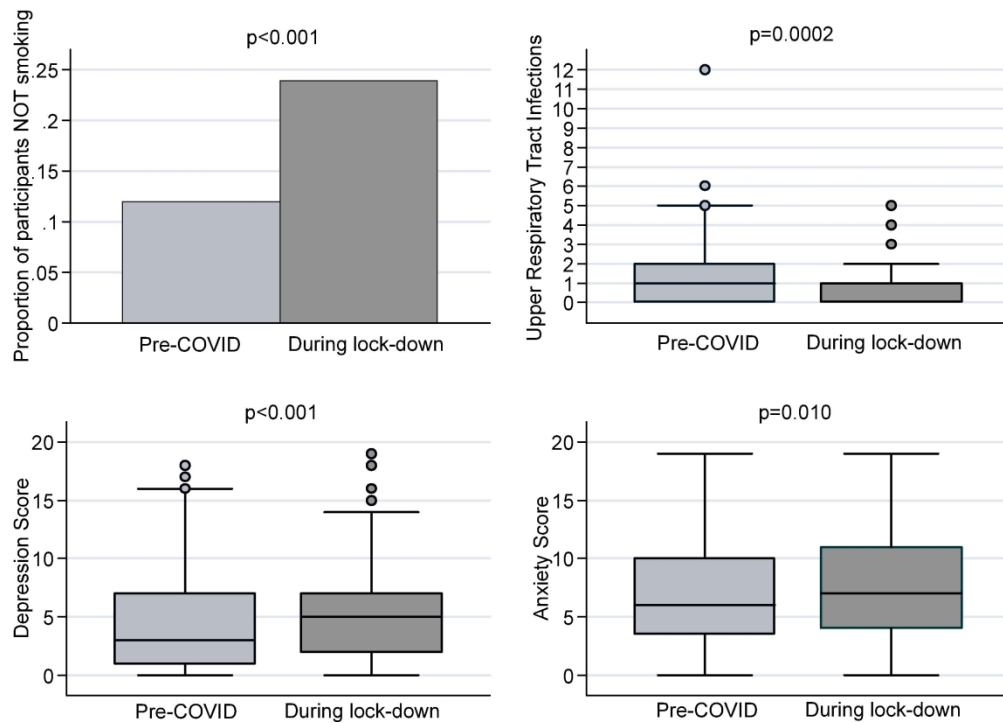


Figure 1. The proportion of non-smoking participants, frequency of upper respiratory tract infections, depression, and anxiety scores, before and during lockdown in the UK during the COVID-19 pandemic.