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Title: Chemical exposure and lung function in the fragrance industry: A multi-site cross-sectional study

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Body: INTRODUCTION Fragrance production employees are exposed to large quantities of chemical mixtures, at exposure levels significantly higher than the final consumer. AIMS AND OBJECTIVES To answer the research question: In fragrance industry employees, is occupational respiratory exposure to chemicals linked to a reduction in lung function? METHODS A cross-sectional study was designed, using an exposed group (fragrance production) and a control group (non-exposed industry employees). 5 UK fragrance companies took part, total sample size was 112 (exposed n=60, controls n=52), calculated as sufficient to achieve 80% power and 5% significance. Spirometric measurements (FEV₁, FVC, PEF) were taken pre- and post-shift, and cross-shift decline was calculated. Questionnaires were completed regarding potential confounding factors (smoking, body mass index, personal or family history of respiratory problems). Analysis of covariance (ANCOVA) was performed using the statistical package SPSS (v18). RESULTS Adjusted mean difference between groups (exposed vs. control) for each outcome was not observed to be statistically significant (table below). Family history of respiratory problems was observed to have a significant effect on PEF (p=0.043).

Adjusted mean differences between Exposed and Control groups*

Outcome	Adjusted mean difference*	95% CI	p-value
FEV1 %pred	0.256	-1.383 - 1.895	0.757
FVC %pred	-0.236	-2.410 - 1.937	0.830
PEF %pred	0.619	-2.518 - 3.756	0.696

*Adjusted for smoking, body mass index, personal history of respiratory problems, family history of respiratory problems

CONCLUSIONS Occupational respiratory exposure to chemicals used in fragrance production did not have a significant effect on lung function.