

Lifestyle, environment, and major determinants of frailty: UK Biobank study

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Background: Frailty is a geriatric syndrome that describes an old person's increased vulnerability to stressors due to the loss of physiological reserves. While some functional decline is expected with age, frailty represents an accelerated and multifactorial deterioration that goes beyond normal ageing, potentially driven by genetic, environmental and lifestyle factors.

Aim: The study aimed to identify exposome determinants of frailty using data from the UK Biobank.

Methods: The study analysed cross-sectional data from over 220,000 participants aged ≥60 years, which were classified as non-frail, pre-frail, and frail using the Fried's phenotype. Over 50 variables were analyzed covering lifestyle, diet, environmental exposure parameters, and several biomarkers. Univariate analysis was followed by Principal Component Analysis (PCA), machine learning, and logistic regression to identify the top frailty predictors.

Results: Frailty risk was mainly shown to be driven by chronological age and C-reactive protein, a marker of chronic inflammation. Higher frailty risk was associated with external factors like poor air quality, poor dietary patterns, smoking, heavy alcohol use, and polypharmacy. Frail participants also showed lower levels of vitamin D. Early life factors, like maternal smoking and the lack of breastfeeding, were linked to higher odds of frailty in late life.

Conclusion: This study showed the multifactorial nature of frailty, driven by lifestyle and environmental factors, while achieving high predictive accuracy. Future longitudinal studies are required to validate these findings and implement preventive measures.

Funding: This work was supported by the Spanish Ministry of Science and Innovation: MCIN/AEI [Grant PID2020-113788RB-I00] and Xunta de Galicia (ED431B 2025/26, and ED481A-2025/085 to C. Lema-Arranz).