



Letter to the Editor

Inhaler Recycling: Environmental Impact and Patient Participation



Reciclaje de inhaladores: impacto ambiental y participación de los pacientes

Dear Editor,

The use of inhalers is essential for managing several respiratory diseases, such as asthma and chronic obstructive pulmonary disease (COPD).

Inhalers, especially metered-dose inhalers (MDIs), use hydrofluoroalkanes (HFAs) as propellants, release the medication in aerosol form for patient inhalation. It is estimated that MDIs count for approximately 3.9% of the carbon footprint of the UK's healthcare system due to the use of HFA as a propellant.¹ Spain is the third European country with the highest prescription rate for pressurized inhalers (55%), with the UK occupying the 1st position.²

In addition, the plastic and metal components of inhalers do not degrade easily, which can contribute to waste accumulation if they are not properly recycled. These devices often end up in landfills, where propellant gases may be released uncontrollably, increasing the greenhouse effect. According to a study, each discarded inhaler can release the equivalent of 500–1700 g of CO₂ into the atmosphere³; as an example to give an idea, the climate footprint of two puffs from an HFC-134a pMDI is comparable to that of a 330 mL cola can or driving a car for 2 km. If not properly managed, these gases contribute to global warming, and the plastic and metal components of these devices pose a problem for landfills.

Inhaler recycling is an essential practice to reduce their environmental impact, and patient participation is central in promoting a culture of environmental responsibility. Education on the correct disposal of these devices should be an integral part of respiratory care. Doctors and healthcare professionals can play a key role by informing patients about the environmental consequences of inhalers and the recycling options available in their communities.^{4,5}

To assess the current situation regarding the recycling of inhalers already consumed by our patients, we conducted a survey to gather their opinions on the environmental impact of inhalers and to find out what they know and do with inhalers once they are fully used.

During 4 months (from September to December 2023), we conducted a voluntary survey of all patients who chronically used inhalers and attended routine spirometry follow-ups for review in our clinic. Statistical analysis of the collected data was performed using the SPSS 25.0 statistical package. Quantitative variables are expressed as means, and qualitative variables as percentages.

We obtained a total of 189 valid surveys for analysis. Most of our patients were male (54.7%) with an average age of 59.25 (± 14.1) years old. The most common condition for which they had been

prescribed inhalers was asthma (49.3%), followed by COPD (42.6%). The distribution of the types of inhalers prescribed and used by our patients was: 25.2% MDIs; 9.5% single-dose dry powder inhalers (DPIs); 54.4% multi-dose DPIs; 10.9% slow mist inhalers.

The majority of patients (80.5%) believe that pollution negatively affects their health, although 13.4% was unsure how to respond. Only 18.1% of respondents believe their inhaler has harmful effects on the environment, while 63.8% stated they were unaware of this detail.

Just 25% had been previously informed about where to dispose of their consumed inhaler (that is, 75% had never been informed); only 20.9% responded affirmatively. Of the 52 patients who had been informed, 40.6% received the information at their pharmacy, 9.4% from their pulmonologist or nursing staff, 6.3% from their family doctor, and 25% could not recall who provided the information.

Nearly half of the patients (45.9%) dispose of their used inhaler in organic waste, 16.2% use the yellow recycling bin, and 37.8% take it to their pharmacy.

We have found that our patients are not sufficiently informed about what to do with their inhalers once they are consumed. We have also seen that most dispose of them in organic waste. Expired MDIs still contain hydrofluorocarbons (HFCs) and should not be disposed of in regular waste, but rather at pharmacies (SIGRE). In our study, only 37.8% did this. Nevertheless, most patients do believe that pollution negatively impacts their health.

Regarding this last aspect, awareness about climate change is a concern for patients, ranking as the top current threat for almost 78% of patients.⁶

Currently, there are recycling initiatives in some countries, such as the "Complete the Cycle" program in the UK, which promotes the collection and recycling of used inhalers at pharmacies. These initiatives allow for the recovery of plastic and metal components from inhalers, while propellant gases are either incinerated or reused in a controlled manner to minimize environmental impact.⁷

However, one of the biggest challenges for the global implementation of these programs is the lack of awareness and participation by patients. A study conducted by Cole et al. in the United States found that 63% of patients were unaware of inhaler recycling options, and only a small percentage actively participated in available recycling programs.⁸

Therefore, we must give better information to our patients about the inhalers we prescribe and involve them more in the way these devices should be recycled, given the impact these devices have on climate change and the accumulation of non-biodegradable waste. Our research highlights the urgent need to educate patients on safe and sustainable disposal practices and to establish policies that facilitate the recycling of these devices. The study's findings offer valuable insights that could inform future environmental health policies and programs.

The article addresses a topic of great importance for both public health and the environment. The management of used inhalers is critical.

Moreover, the focus on patient participation and their awareness of inhaler recycling is crucial, as user collaboration is essential for the success of any recycling program. By raising awareness and engaging patients, not only is the environmental impact reduced, but an eco-responsible culture within healthcare is also fostered.

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Authors' contributions

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Conflicts of interest

The authors declare that they have no conflicts of interest.

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