

OPEN

The unknown risks of scented candles! what science has to say: an editorial

Zainab Nazir, MBBS^a, Ashna Habib, MBBS^a, Tooba Ali, MBBS^a, Hafsa Ghouri, MBBS^a, Md Ariful Hague, MBBS, MD, MPH^{b,c,d,*}

Indoor air pollution is mainly caused by combustion, building materials, and bioaerosols^[1]. This is one of the most common health issues in developing nations^[1]. A number of treatment options, such as aromatherapy, are used to alleviate psychological discomfort and promote healing^[2]. Among such treatments, the use of scented candles has acquired a lot of consideration with the rapidly expanding interest in room decor and indoor air fresheners. For generations, people have used scented candles to set a tranquil and soothing mood. The U.S. market for scented candles is estimated to be worth approximately 2 billion USD annually due to rising demand^[2]. When scented candles are lit indoors, several harmful gasses are released. They range greatly, from those known to have no effect on health except for those that may be cancerous^[3]. The discharge of combustion gasses like carbon monoxide or nitrogen oxide would contaminate the interior environment, according to studies done in environmental test chambers^[3]. A number of polycyclic aromatic hydrocarbons that have been identified as carcinogens, such as naphthalene, anthracene, and pyrene, were also found in candle fumes that are products of wax, aroma substances, or combustion dyes^[4]. The most common complaints from those who had been exposed to scented candles were vertigo, headaches, mucosa irritation, respiratory issues, watery eyes, sneezing, stuffy nose, chest tightness, and a dry or irritated throat. Formaldehyde and aromatic hydrocarbons like toluene and benzopyrene may be released in large quantities from commonly available scented candles, especially the less expensive ones made from paraffin

^aDow University of Health Sciences, Mission Road, Karachi, Pakistan, ^bDepartment of Public Health, Atish Dipankar University of Science and Technology, ^cVoice of Doctors Research School, Dhaka, Bangladesh and ^dDepartment of Orthopaedic Surgery, Yan'an Hospital Affiliated to Kunming Medical University, Kunming, Yunnan, China

Sponsorships or competing interests that may be relevant to content are disclosed at the end of this article.

*Corresponding author. Address: Department of Public Health, Atish Dipankar University of Science and Technology, Dhaka, Bangladesh, Voice of Doctors Research School, Dhaka, Bangladesh. Tel.: +861 848 711 2849; fax: +880 189 477 3747 E-mail: Arifulhaque58@gmail.com (M.A. Haque).

Copyright © 2023 The Author(s). Published by Wolters Kluwer Health, Inc. This is an open access article distributed under the terms of the Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 (CCBY-NC-ND), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

Annals of Medicine & Surgery (2024) 86:16–17
Received 30 September 2023; Accepted 9 November 2023
Published online 17 November 2023
http://dx.doi.org/10.1097/MS9.0000000000001524

wax^[2]. According to a study, a 66-year-old woman was diagnosed with exogenous lipoid pneumonia after inhaling vaporized paraffin from burning candles^[5]. When burning scented candles indoors, quantities of pollutants such as formaldehyde, CO2, and volatile organic compounds were measured that were higher than background levels, showing that the candles were one of the sources of indoor pollution^[6]. Aroma candles not only have poor wax quality, but they also contain dyes and artificial scents that, when burned, release a variety of chemicals. Petroleum is the source of 95% of the chemicals used in synthetic perfumes and scented candles and contains benzene derivatives. Candle waxes are still coloured using toluene derivatives and benzidine-based dyes, which have been associated with urothelial cancer development^[7]. Frequent consumption of scented candles for quite a long time and their use in inadequately ventilated rooms may increase the chance of developing urothelial cancer. Additionally, scented candles are also widely available on the market, with low quality and undefined raw materials. Public health authorities should be warned that indoor candle burning on a regular basis can expose us to dangerous levels of organic pollutants. Candle chemicals, fragrances, and wax are wellknown asthma and allergy irritants. Given the danger, it could be a good idea to implement simple preventive steps. It is recommended to choose candles manufactured from natural materials, such as beeswax or soy wax, and scented with essential oils rather than synthetic perfumes, to reduce exposure to pollutants from scented candles. After using scented candles, the space should be aired to get rid of the chemical compounds produced while burning. The quality of the used scented candles should be taken into consideration, and we should attempt to stay away from ones that are of low quality and made of paraffin or artificial materials. Manufacturers of scented candles should be compelled to include a brief statement or image notifying the consumer about the dangers of indoor pollution and other related health issues under new labelling and packaging laws.

Ethical approval

Ethics approval was not required for this editorial.

Consent

This study was not done on patients therefore no written consent was required.

Sources of funding

Not applicable.

Author contribution

Z.N., T.A., A.H. and H.G.: conception of study, major drafting of work, literature search, final approval agreeing to the accuracy of work. M.A.H.: supervise this work.

Conflicts of interest disclosure

The authors declare that they have no financial conflicts of interest with regard to the consent of this report.

Research registration unique identifying number (UIN)

Not applicable.

Guarantor

Zainab Nazir.

Data availability statement

Not applicable.

Provenance and peer review

Not commissioned, externally peer-reviewed.

References

- [1] Bray F, Ferlay J, Soerjomataram I, et al. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. A Cancer Journal for Clinicians 2018;68: 394–424.
- [2] Ahn J-H, Kim K-H, Kim Y-H, *et al.* Characterization of hazardous and odorous volatiles emitted from scented candles before lighting and when lit. Journal of Hazardous Materials 2015;286:242–51.
- [3] Petry T, Cazelle E, Lloyd P, *et al.* A standard method for measuring benzene and formaldehyde emissions from candles in emission test chambers for human health risk assessment purposes. Environmental Science: Processes & Impacts 2013;15:1369.
- [4] Orecchio S. Polycyclic aromatic hydrocarbons (PAHs) in indoor emission from decorative candles. Atmospheric Environment 2011;45: 1888–95.
- [5] Katsumi H, Tominaga M, Tajiri M, et al. A case of lipoid pneumonia caused by inhalation of vaporized paraffin from burning candles. Respiratory Medicine Case Reports 2016;19:166–8.
- [6] The air fresheners influence on the quality of the air—cross-sectional. Taylor & Francis n.d. https://doi.org/10.1201/b21172-76:https://www.taylorfrancis.com/chapters/edit/10.1201/b21172-76/air-fresheners-influence-quality-air%E2%80%94cross-sectional-study-duque-ferreira-figueiredo
- [7] Adamowicz J, Juszczak K, Poletajew S, et al. Scented candles as an unrecognized factor that increases the risk of bladder cancer; is there enough evidence to raise a red flag? Cancer Prevention Research 2019;12: 645–52.