

Dermatologists' Responses to Benzene Being Reported as a Contaminant in Sunscreen: A Cross-Sectional Analysis

Alexander J. Jafari BA,^{a,b} Paul J. Christos DrPH MS,^c Shari R. Lipner MD PhD^d

^aDepartment of Dermatology, Tulane University School of Medicine, New Orleans, LA

^bTulane University School of Public Health and Tropical Medicine, New Orleans, LA

^cDepartment of Population Health Sciences, Weill Cornell Medicine, New York, NY

^dDepartment of Dermatology, Weill Cornell Medicine, New York, NY

INTRODUCTION

Benzene, a known human carcinogen, was recently found in certain batches of sunscreen products. Our objectives were to analyze the messages conveyed in dermatologists' social media posts on this topic. Two social media platforms, Instagram and TikTok, were searched for posts containing the tag "#benzene." A total of 75 posts from 47 distinct dermatologists were analyzed. The majority of posts were video based (69.3%) and posted on Instagram (64.0%). The majority of posts (62.7%) referenced the original study that identified benzene in sunscreen. 90.7% of posts mentioned a contamination issue, 73.3% mentioned that benzene is not a normal sunscreen ingredient, and 76.0% recommended continued sunscreen use. Our study highlights the importance of dermatologists as health educators on social media.

Valisure, an independent laboratory, reported on 5/25/21 that benzene, a known carcinogen, was found in 78 sunscreens and after-sun products.¹ In response, Johnson & Johnson voluntarily recalled five sunscreens on the Valisure list.² We sought to analyze messages conveyed in dermatologists' social media posts on this topic.

Instagram and TikTok were searched for "#benzene" posts between 5/25/2021 and 8/31/2021. Inclusion criteria included: posts from dermatologists, video- or photo-based posts, posts from a public account, and relevance. Dermatologist demographics and messages posted were recorded and analyzed. All statistical analyses were performed using SAS v9.4 (SAS Institute, Inc., Cary, NC).

A total of 75 posts were included in the final analysis, from 47 distinct dermatologists, 76.6% female, and with 14 dermatologists having multiple posts. The average number of posts per dermatologist was 1.6. Twenty-eight dermatologists (59.6%) were white, 12 (25.5%) were Asian, 5 (10.6%) were black, and 2 (4.3%) were Hispanic. The majority were attendings (91.5%) and most commonly from the Northeast (31.9%; Table 1).

TABLE 1.

| Demographic Characteristics of Dermatologists (N = 47) Posting | |
|--|------------------------------|
| | Number of Dermatologists (%) |
| Sex | |
| Female | 36 (76.6) |
| Male | 11 (23.4) |
| Race | |
| White | 28 (59.6) |
| Asian | 12 (25.5) |
| Black | 5 (10.6) |
| Hispanic | 2 (4.3) |
| Training | |
| Attending | 43 (91.5) |
| Resident | 4 (8.5) |
| Degree | |
| MD | 44 (93.6) |
| DO | 3 (6.4) |
| Geographic region | |
| Northeast | 15 (31.9) |
| West & Pacific West | 12 (25.5) |
| Southeast | 8 (17.0) |
| Midwest | 7 (14.9) |
| Middle Atlantic | 4 (8.5) |
| Canada | 1 (2.1) |

The majority of posts were video based (69.3%) and posted on Instagram (64.0%). Dermatologists had an average 236,392 followers (range: 153–1,400,000). The mean length of video-based posts was 59 seconds (range: 5–265s). Nineteen primary messages were conveyed across posts (Table 2). The majority of posts (62.7%) referenced the Valisure study, with more posts

TABLE 2.

| Characteristics of Distinct Social Media Posts (N = 75) | | | | |
|---|-------------------------------------|--|---|----------|
| | Total number of posts (%) N = 75 | *Number of posts before recall (%) N = 44 | *Number of posts after recall (%) N = 31 | P-value |
| Type of post | | | | |
| Video-based | 52 (69.3) | -- | -- | -- |
| Photo-based | 23 (30.6) | -- | -- | -- |
| Social media outlet | | | | |
| Instagram | 48 (64.0) | -- | -- | -- |
| TikTok | 27 (36.0) | -- | -- | -- |
| Messages conveyed | | | | |
| Referenced Valisure study | 47 (62.7) | 36 (81.8) | 11 (35.5) | *<0.0001 |
| Listed products contaminated with benzene | 41 (54.7) | 22 (50.0) | 19 (61.3) | †0.33 |
| Explained how to properly dispose of contaminated products | 35 (46.7) | 22 (50.0) | 13 (41.9) | †0.49 |
| Explained that benzene is a known human carcinogen | 62 (82.7) | 37 (84.1) | 25 (80.6) | †0.70 |
| Referenced the concentrations of benzene found in Valisure study | 35 (46.7) | 21 (47.7) | 14 (45.2) | †0.83 |
| Discussed ubiquity of benzene | 26 (34.7) | 13 (29.5) | 13 (41.9) | †0.27 |
| Explained that this was a contamination issue | 68 (90.7) | 41 (93.2) | 27 (87.1) | †0.37 |
| Mentioned that benzene is not a normal component/ breakdown product of sunscreen | 55 (73.3) | 35 (79.5) | 20 (64.5) | †0.15 |
| Discouraged fearmongering | 23 (30.7) | 11 (25.0) | 12 (38.7) | †0.21 |
| Encouraged continued sunscreen use | 57 (76.0) | 34 (77.3) | 23 (74.2) | †0.76 |
| Mentioned that sunscreen does not cause cancer | 8 (10.7) | 4 (9.1) | 4 (12.9) | †0.60 |
| Reviewed normal components in sunscreen | 10 (13.1) | 6 (13.6) | 4 (12.9) | §0.99 |
| Emphasized how UV exposure can lead to skin cancer | 18 (24.0) | 12 (27.3) | 6 (19.4) | §0.43 |
| Mentioned that sunscreen can help prevent skin cancer | 32 (42.7) | 20 (45.5) | 12 (38.7) | †0.56 |
| Mentioned that sunscreen can help prevent photoaging | 10 (13.3) | 5 (11.4) | 5 (16.1) | §0.73 |
| Discussed other measures of sun protection (eg, seeking shade, UV protective clothing, etc.) | 16 (21.3) | 9 (20.5) | 7 (22.6) | §0.83 |
| Discussed policy implications | 15 (20.0) | 10 (22.7) | 5 (16.1) | §0.48 |
| Listed recommended sunscreens | 24 (32.0) | 12 (27.3) | 12 (38.7) | †0.30 |
| Advertised their own sunscreens | 4 (5.3) | 1 (2.3) | 3 (9.7) | §0.30 |

*For the nineteen messages conveyed in social media posts, counts of those posted before and after the recall are shown.

† by χ^2 test

§ by Fisher's exact test

referencing it before the Johnson & Johnson recall compared to after the recall (81.8% vs 35.5%, respectively; $P < 0.0001$). For other key messages, 90.7% of posts mentioned a contamination issue, 73.3% mentioned that benzene is not a normal sunscreen ingredient, and 76.0% recommended continued sunscreen use (Table 2).

Social media has had a significant impact on health-related behaviors in recent years. In a survey-based study of 130 acne

patients, 45% reported using social media for acne treatment advice.³ Similarly, in a survey-based study of 150 participants, 15% stated that social media sites influenced their decision to undergo cosmetic procedures.⁴ Therefore, it is important that dermatologists have a significant presence on social media to disseminate accurate information. Twice as many dermatologists posting about benzene in our study utilized Instagram versus TikTok. Instagram's popularity may be explained by its older age, longer videos, and integration with sharing of videos.⁵

The majority of posts emphasized that benzene is not normally found in sunscreen and that this was a contamination issue. Most dermatologists educated the public on sunscreen's photoprotective properties and encouraged their followers to continue applying sunscreen.

Limitations of this study include small sample size of posts and dermatologists. Dermatologists on Instagram might have posted "Stories", which could not be analyzed because they disappear after twenty-four hours. We may have missed posts about benzene, by limiting our search to "#benzene".

In sum, dermatologists on Instagram and TikTok informed followers that benzene is not a normal ingredient in sunscreen and that continued sunscreen use is essential in preventing skin cancer. Our study highlights the importance of dermatologists as health educators on social media, an increasingly popular outlet for health-related information among patients.

DISCLOSURES

Mr. Jafari has no conflicts of interest. Dr. Lipner has served as a consultant for Ortho-Dermatologics, Verrica, and Hoth Therapeutics.

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AUTHOR CORRESPONDENCE

Shari R. Lipner MD PhD

E-mail:..... shl9032@med.cornell.edu