Medical Xpress

New study finds associations between use of skin care products and exposure to potential developmental toxicants

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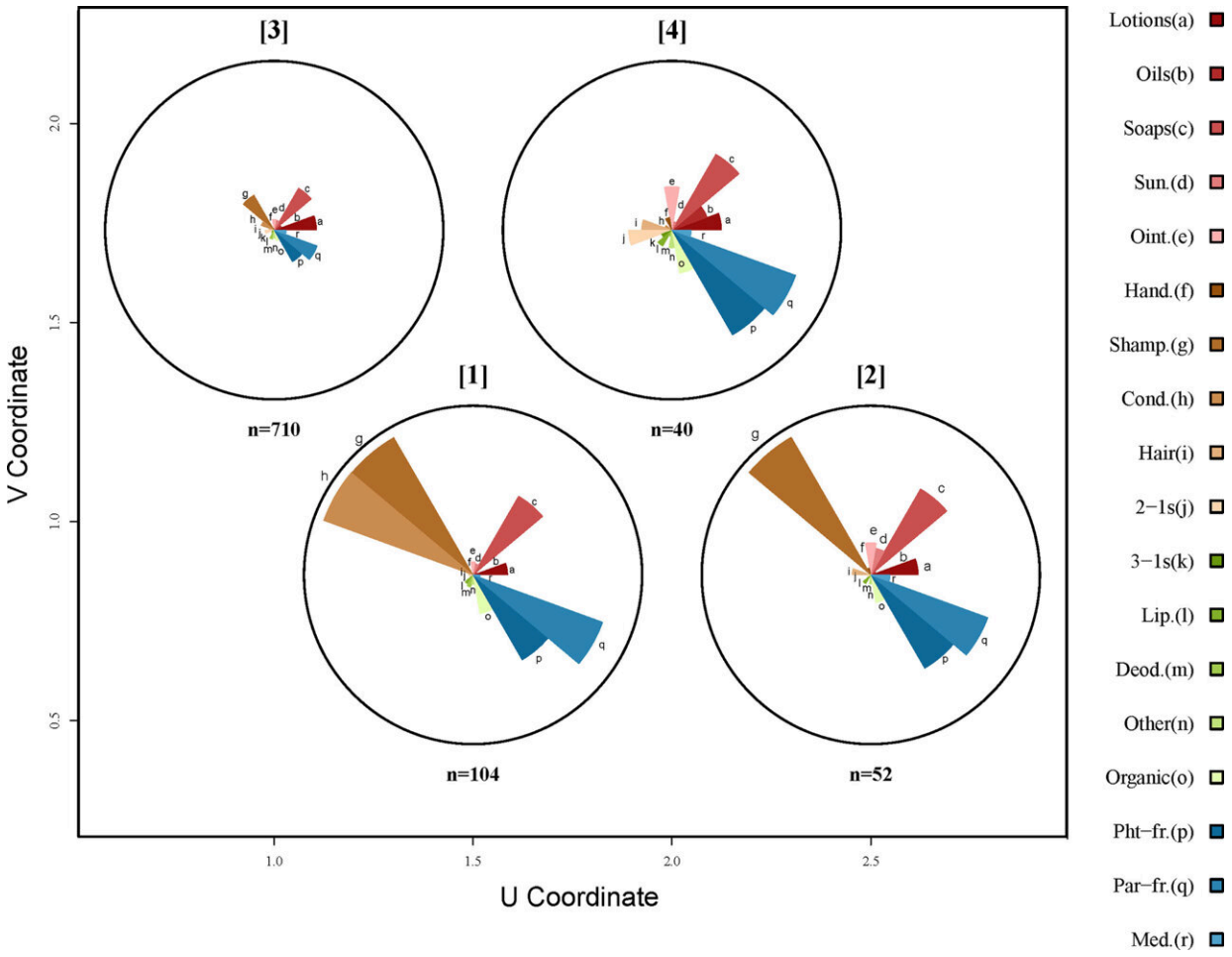

Exposure continuum map describing frequencies of children of ECHO-FGS participants categorized into SCP-use exposure profiles using a self-organizing map (□□=906) (numeric data in Table S11). Note: Exposure profile categories are defined based on the frequencies of participant responses to each SCP-use

question and illustrated using radial bars labeled with letters indicating the average reported frequencies normalized to the range of reported frequencies in the study population; longer bars correspond to greater use. For example, exposure profiles 2 and 4 include children that reported greater use of lotions than children in exposure profiles 1 and 3. Cond., hair conditioner; Deod., deodorant; ECHO-FGS, Environmental Influences on Child Health Outcomes-Fetal Growth Study; Hair, hair products other than shampoo, conditioner, or oil; Hand., hand sanitizer; Lip., lip products; Med., medicated products; Oils, hair oil; Organic, products using only organic ingredients; Par-fr., paraben-free products; Pht-fr., phthalate-free products; SCP, personal care product; Soap, bar soap, liquid soap, and body wash; Sun., sunscreen; 2–1s, 2-in-1 shampoo and hair conditioner products; 3–1s, 3-in-1 body wash, shampoo, and hair conditioner products. Credit: *Environmental Health Perspectives* (2024). DOI: 10.1289/EHP13937

A new study led by primary investigator Michael S. Bloom, professor in the Department of Global and Community Health at George Mason University's College of Public Health, has found that use of skin care products including lotions, hair oils, hair conditioners, ointments, and sunscreen is associated with higher levels of phthalates in children's urine. The associations depend in part upon the child's racial and ethnic identity and their sex as assigned at birth. The study was co-authored by two George Mason Master of Public Health alumni, Juliana Clark and Kelly Garcia.

The study is published in the journal *Environmental Health Perspectives*.

"This is the first study to suggest that different skin care products used by young children may differentially increase exposure to endocrine-disrupting phthalates and phthalate replacements in young children," said Bloom.

Phthalates and phthalate-replacement compounds are endocrine-disrupting chemicals, meaning they may interfere with the body's hormones. Exposure to these chemicals in early childhood has been associated with neurodevelopmental, reproductive, and metabolic disease concerns in previous studies. Some of these chemicals are often used as carriers for the active ingredients in skin care products; others may be used in plastic packaging.

The study collected medical data from 630 children between the ages of four and eight from 10 different sites across the United States, including a clinical examination and a urinalysis. The child's parent or guardian was also asked to complete a survey within 24 hours prior to the child's examination, which included questions regarding the child's sociodemographic information (race/ethnic identity, sex assigned at birth, etc.). It also asked parents to list all the skin care products, including lotions, soaps, shampoos, oils, and cosmetics, that were applied to the child's skin in the 24 hours prior to their examination, with as much specificity as possible regarding the product type and brand or generic name.

"We found associations between recent use of different skin care products and higher concentrations of phthalate and phthalate-replacement compounds," said Bloom. "There were different relationships between the use of skin care products and the endocrine-disrupting chemicals in children depending on their racial and ethnic identities and their sex assigned at birth. We also found that distinct patterns of using multiple skin care products were predictive of higher concentrations of phthalates and phthalate replacements."

While Bloom and his team say that further studies are necessary to confirm these findings, the results suggest that children in different racial and ethnic groups may experience different levels of risk for exposure to phthalates. In particular, they found the highest levels of

phthalates and phthalate replacements in the urine of non-Hispanic Black participants. The differences may correlate to brand availability and preferences, methods and timing of product application, and/or the frequency of use by children with different racial and ethnic identities.

"The results can inform policies to address the use of endocrine-disrupting chemicals in skin care products that may be used on children and to help advise parents' decisions about using products to limit their children's exposure to potential developmental toxicants," said Bloom.

More information: Michael S. Bloom et al, Impact of Skin Care Products on Phthalates and Phthalate Replacements in Children: the ECHO-FGS, *Environmental Health Perspectives* (2024). DOI: 10.1289/EHP13937

Provided by George Mason University