

**CONTACT POINTS**

Use of essential oils: A general population survey

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METHODS

Minnesota State Fair attendees aged >18 years were invited to complete a 17-question, institutional review board-approved survey on essential oil (EO) use. The questionnaire was designed with input by experts in contact dermatitis (E.W. and S.H.) and survey methodology (N.G. and E.W.).

RESULTS

Half of the approached individuals completed the survey. The characteristics of the 282 respondents are summarized in Table 1. Among EO users, the top EO-treated conditions included: musculo-skeletal (50.5%), emotional (37.4%), upper respiratory (37.4%) and skin (28.0%) conditions. The reasons cited for EO use included: a desire for alternative treatments (53.4%), the opinion that EOs are safer than traditional therapies (47.6%), and/or failure of standard treatments (10.7%). Of the respondents, 54.5% reported diffusing EOs, and 30.3% incorporated EOs into homemade products (Table 2). The frequency of specific EO use is shown in Table 3; other commonly used natural products included coconut oil (40.6%), aloe (29.2%), apple cider vinegar (28.3%), shea butter (26.4%), and vitamin E (20.8%).

EOs were purchased from health cooperative/food stores (48.8%), family/friends (36.4%), or the internet (22.3%). Nine respondents (7.4%) sold EOs. Ten adverse reactions were reported by eight EO users (rash, n = 3; breathing difficulty, n = 2; burning

sensation, n = 2; allergy, n = 2; and burning with urination after oral ingestion, n = 1).

DISCUSSION

This study has several key findings. First, we found that interest in natural products and use of EOs was high among all respondents (49.6% and 47.2%, respectively). Approximately one third (30.1%) of respondents reported using EOs within the last month. This rate of EO use is similar to that found in a general population study in France (34%).¹ Second, we found that EO use was statistically significantly associated with female sex, younger age, and higher education, but not race. EO use was also significantly associated with interest in natural/botanical products, and having close family members and close friends who are EO users. Third, many EO users treated medical conditions/symptoms (46.7%) with the EOs.

The consumer EO market in the United States is largely composed of multilevel/networking marketing strategy companies (direct consumer sales via a hierarchy of individual distributors). It is likely that the 36.4% of participants in our study who obtained EOs from family/friends purchased EOs from multilevel/network marketing companies. In contrast, >95% of French EO users purchased EOs from stores or the internet.¹

EOs are widely believed to be safe by the lay public. However, 79 EOs have been reported to cause contact dermatitis and have been extensively reviewed elsewhere.² An Italian study found that 11%

TABLE 1 Demographics of survey participants

	EO use N = 133 ^a	No EO use N = 149 ^a	EO use vs no EO use RR (95%CI) P value
Sex, N = 279			
Female	113 (86.3%)	94 (64.5%)	2.18 (1.44-3.32) P < 0.001
Male	18 (13.7%)	54 (36.5%)	
Age (years), N = 278			
≤50	66 (50.0%)	43 (29.5%)	1.55 (1.22-1.97) P = 0.0005
18-30	20	14	
31-40	23	15	
41-50	23	14	
>50	66 (50.0%)	103 (70.5%)	
51-60	32	32	
61-70	30	47	
>71	4	24	
Race/ethnicity, N = 280			
White	121 (92.4%)	142 (95.3%)	0.78 (0.51-1.19) P = 0.30
Non-white	10 (7.6%)	7 (4.7%)	
Black	4	1	
Hispanic	2	1	
Asian	2	4	
Native American	0	0	
Other	2	1	
Education, N = 281			
College degree or higher	79 (76.8%)	88 (59.5%)	1.42 (1.15-1.75) P = 0.0003
Bachelor	54	59	
Masters/MD/PhD	25	29	
No college degree	54 (23.2%)	60 (40.5%)	
High school	20	31	
Trade	33	27	
None	1	2	

CI, confidence interval; EO, essential oil; RR, risk ratio.

^aThe denominator for each characteristic varies due to missing values.

(139/1274) of botanical users reported adverse reactions.³ We were surprised that over half of our study participants reported diffusing EOs (54.5%), which may cause airborne contact dermatitis.⁴ Importantly, a study of 62 354 patch tested patients (from North America and central Europe) found that 7.4% of EO patch test-positive

individuals did not react to standard fragrance allergens (fragrance mix I/II and *Myroxylon pereirae* [balsam of Peru]), underscoring the need to patch test with specific EOs.⁵

Study limitations include possible selection bias and the non-randomized (convenience) sampling methodology.

In summary, we found that EO use was high. Adverse events caused by EOs (including contact dermatitis) may increase with the rising popularity of EOs.

TABLE 2 Home-made products incorporating essential oils according to 99 participants

	Participants n (%)
None	69 (69.7)
Moisturizer	9 (9.1)
Body/face soap	8 (8.1)
Perfume/cologne	7 (7.1)
Other ^a	7 (7.1)
Deodorant	6 (6.1)
Laundry products	6 (6.1)
Hair products	5 (5.1)
Sunscreen	4 (4.0)
Toothpaste	3 (3.0)
Make-up	0 (0.0)

^aCleaning products, rollerball blends, bath soaks, and body scrub.

CONFLICTS OF INTEREST

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TABLE 3 Utilization frequency of specific essential oils according to 106 participants (the nomenclature is deliberately that used in the survey, not INCI terminology)

Essential oil	Participants n (%)
Lavender	79 (74.5)
Tea tree	66 (62.3)
Peppermint	60 (56.6)
Eucalyptus	55 (51.9)
Lemon	36 (34.0)
Frankincense	29 (27.4)
Lemongrass	23 (21.7)
Essential oil mixes	23 (21.7)
Chamomile	22 (20.8)
Sandalwood	22 (20.8)
Cedarwood	19 (17.9)
Grapefruit	19 (17.9)
Patchouli	19 (17.9)
Oregano	14 (13.2)
Ylang-ylang	14 (13.2)
Bergamot	13 (12.3)
Clove	13 (12.3)
Basil	11 (10.4)
Clary sage	10 (9.4)
Other	9 (8.5)
Jasmine	8 (7.5)
Mandarin	8 (7.5)
Geranium	7 (6.6)
Neroli	5 (4.7)
Marjoram	3 (2.8)
Marigold	2 (1.9)

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