(multiproject assurance M-1531) granted by the Office for Protection from Research Risks; thus, our project does not require specific review by an IRB.

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REFERENCES

1. Rui P, Kang K. *National Hospital Ambulatory Medical Care Survey: 2017 Emergency Department Summary Tables*. National Center for Health Statistics. Accessed April 22, 2020. Available at: https://www.cdc.gov/nchs/data/nhamcs/web_tables/2017_ed_web_tables-508.pdf.
2. McCaig LF, Ly N. *National Hospital Ambulatory Medical Care Survey: 2000 Emergency Department Summary. Advance Data From Vital and Health Statistics*. National Center for Health Statistics no. 326. 2002.
3. Nadkarni A, Domeisen N, Hill D, Feldman SR. The most common dermatology diagnoses in the emergency department. *J Am Acad Dermatol*. 2016;75(6):1261-1262.
4. Arakaki RY, Strazzula L, Woo E, Kroshinsky D. The impact of dermatology consultation on diagnostic accuracy and antibiotic use among patients with suspected cellulitis seen at outpatient internal medicine offices: a randomized clinical trial. *JAMA Dermatol*. 2014;150(10):1056-1061.
5. Strazzula L, Cotliar J, Fox LP, et al. Inpatient dermatology consultation aids diagnosis of cellulitis among hospitalized patients: a multi-institutional analysis. *J Am Acad Dermatol*. 2015;73(1):70-75.

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Evaluation of the cost and efficacy of home-formulated sunscreens

To the Editor: For some, the cost of commercial sunscreens may contribute to poor adherence to sunscreen application guidelines.[1] The availability of effective sunscreens at significantly reduced costs could lead to improved compliance and help mitigate the harmful effects of ultraviolet (UV) radiation (UVR). Our study shows that home-formulated sunscreens may be an economical and possibly effective alternative to commercial sunscreens for consumers unable to afford commercial sunscreens.

Twenty-four home-formulated sunscreens varying in zinc oxide (ZnO) and titanium dioxide (TiO_2) content (Table I) were compared to 4 sun protection factor (SPF) 30 commercial mineral sunscreens (Table II). All sunscreens were prepared in the kitchen as a consumer would, by heating together a base of ½ cup sweet almond oil, ¼ cup coconut oil, ¼ cup beeswax, and 10 drops red raspberry seed oil.[2] Non-nanosized ZnO and/or TiO_2 were added after cooling (Supplementary Materials; available via Mendeley at https://dx.doi.org/10.17632/yfw6m4pcpw.1).

Preparations were tested in a laboratory setting. Consistent with US Food and Drug Administration requirements for in vivo SPF testing,[3] each product was applied to UV-transparent quartz glass in an amount equating to 2 mg/cm^2. A Newport Oriel (Irvine, CA) SOL-UV-6 solar simulator was the UV source, and UVR transmittance through samples was measured with a Solarmeter (Solar Light Company, Glenside, PA) Model 5.0 Standard UVA + B Meter digital radiometer. Mean UVR transmittances and costs for home-formulated and commercial sunscreens are shown in Tables I and II.

Home-formulated sunscreens with higher ZnO and/or TiO_2 content (designated by asterisks) had mean UV transmittance values lower than 3 of the 4 tested commercial sunscreens (C2, C3, C4). These had significantly higher mineral filter content than recommended by most recipes found online. Formulations with lower filter content (similar to online recipes) did not perform well.

All home-formulated sunscreens were significantly less expensive than the commercial sunscreens. The cost of 8 ounces of the 12 best-performing homemade sunscreens was $4.12 to $6.97. The cost of 8 ounces of the commercial sunscreens was $21.04 to $58.00. The median weekly cost of applying commercial sunscreen per recommended guidelines for a family of 4 at the beach has been estimated to be $238.40.[1] The same quantity of home-formulated sunscreen number 19 would cost $25.61. Initially, there would be a greater expenditure for the purchase of all ingredients in large quantities.

A recent study on the online popularity of home-formulated sunscreens suggests that consumers already use homemade sunscreens, with recipes being shared up to 21,000 times.[4,5] However, most of these recipes were thought by the investigators of the study to provide inadequate UVR protection.[5] Although still appealing to those desiring homemade products, the 12 best-performing sunscreens in this study show UVR-blocking capabilities comparable to those of commercial sunscreens. However, the efficacy of homemade sunscreen may potentially vary between batches because of inconsistencies in consumer preparation.

Our data suggests that some home-formulated sunscreens might provide an economical and effective alternative to commercial sunscreens, especially

Table I. Composition, UVR transmittance, and cost of home-formulated sunscreens and sunscreen base

Preparation number	Composition	Mean UVR transmittance, %	Cost of 8 ounces, US dollars
1 (Base)	0% ZnO, 0% TiO_2	93	$3.28
2	3% ZnO, 0% TiO_2	57	$3.35
3	6.5% ZnO, 0% TiO_2	25	$3.43
4	12.5% ZnO, 0% TiO_2	13	$3.60
5	25% ZnO, 0% TiO_2	5	$4.02
6	0% ZnO, 3% TiO_2	48	$3.44
7	0% ZnO, 6.5% TiO_2	15	$3.64
8	0% ZnO, 12.5% TiO_2	4	$4.02
9*	0% ZnO, 25% TiO_2	1	$5.00
10	3% ZnO, 3% TiO_2	19	$3.52
11	3% ZnO, 6.5% TiO_2	7	$3.72
12*	3% ZnO, 12.5% TiO_2	3	$4.12
13*	3% ZnO, 25% TiO_2	1	$5.16
14	6.5% ZnO, 3% TiO_2	17	$3.61
15	6.5% ZnO, 6.5% TiO_2	5	$3.83
16*	6.5% ZnO, 12.5% TiO_2	2	$4.25
17*	6.5% ZnO, 25% TiO_2	1	$5.37
18	12.5% ZnO, 3% TiO_2	10	$3.79
19*	12.5% ZnO, 6.5% TiO_2	2	$4.04
20*	12.5% ZnO, 12.5% TiO_2	1	$4.51
21*	12.5% ZnO, 25% TiO_2	1	$5.79
22*	25% ZnO, 3% TiO_2	1	$4.27
23*	25% ZnO, 6.5% TiO_2	1	$4.58
24*	25% ZnO, 12.5% TiO_2	<1	$5.20
25*	25% ZnO, 25% TiO_2	<1	$6.97

TiO_2, Titanium dioxide; *UVR*, ultraviolet radiation; *ZnO*, zinc oxide.
*One of 12 best-performing home-formulated sunscreens with lower mean UVR transmittance than 3 of 4 tested commercial sunscreens.

Table II. Composition, UVR transmittance, and cost of commercial sunscreens and nonsunscreen moisturizer

Sunscreen identifier	Sunscreen name	Active ingredients	Mean UVR transmittance, %	Cost of 8 ounces, US dollars
CL	Commercial moisturizing lotion	NA	100	NA
C1	SPF 30 sunscreen with 18.24% ZnO	18.24% ZnO	1	$23.68
C2	SPF 30 sunscreen with 5% ZnO and 6% TiO_2	5% ZnO, 6% TiO_2	5	$26.48
C3	SPF 30 sunscreen with 3% ZnO and 3% TiO_2	3% ZnO, 3% TiO_2	8	$21.04
C4	Organic SPF 30 sunscreen with ZnO and TiO_2	Percentages not listed	4	$58.00

NA, Not applicable; *SPF*, sun protection factor; *TiO_2*, titanium dioxide; *UVR*, ultraviolet radiation; *ZnO*, zinc oxide.

for people unable to afford commercial sunscreens and consumers who prefer homemade skin care products. One base recipe was tested, and other recipes and ingredients cannot be assumed to be effective. We cannot currently recommend the use of homemade sunscreens without additional research to further evaluate efficacy and safety. Planned studies include SPF testing, water-resistance testing, and shelf-life determination.

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REFERENCES

1. Mahé E, Beauchet A, de Maleissye M-F, Saiag P. Are sunscreens luxury products? *J Am Acad Dermatol*. 2011;65(3):e73-e79.
2. Wells K. How to make natural homemade sunscreen: wellness mama. Wellness Mama. Accessed February 6, 2020. Available at: https://wellnessmama.com/2558/homemade-sunscreen/; 2020.
3. CFR - code of federal regulations title 21, volume 4. US Food and Drug Administration. Accessed February 6, 2020. Available at: https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfCFR/CFRSearch.cfm?fr=201.327; 2019.
4. Kanellis VG. Sharing recipes and creating potentially dangerous homemade sunscreens. *Australas J Dermatol*. 2020;61:161.
5. Merten JW, Roberts KJ, King JL, McKenzie LB. Pinterest homemade sunscreens: a recipe for sunburn. *Health Commun*. 2020;35:1123-1128.

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Patient survey reports association between compression stocking use adherence and stasis dermatitis flare frequency

To the Editor: Compression stocking use for stasis dermatitis is an effective treatment to control symptoms, especially during acute flares.[1] The annual health care cost of stasis dermatitis is $195 to $515 million, including unnecessary hospitalizations.[2] High rates of noncompliance (60%-70%) with compression stocking use have been documented, but underlying factors are not well understood.[1] We sought to characterize the patient-reported concerns that influence adherence to prescribed use of compression stockings.

A cross-sectional survey was conducted at Saint Louis University with Institutional Review Board approval. An electronic medical record search identified patients who were seen in the outpatient dermatology clinic between February 1, 2017, and May 1, 2018, and were coded with *International Classification of Diseases, 10th Revision* I87.2 for stasis dermatitis. We reviewed patient records to confirm a board-certified dermatologist had diagnosed stasis dermatitis and recommended compression stocking use at the most recent office visit. We contacted 111 eligible patients, and 100

Table I. Patient demographics and interview responses

Variable	Result* (N = 100)
Demographics and medical history	
Female	54 (54)
Age, y	68.8 ± 12.0
Use of topical steroids	61 (61)
History of hospitalization for cellulitis	22 (22)
Interview responses	
Knowledge of physician recommended stocking use	91 (91)
General understanding of how stockings work	74 (74)
Knowledge of hours recommended by the physician	
<8 h/d	2 (2)
8-12 h/d	9 (10)
12-16 h/d	15 (16)
>16 h/d	7 (8)
Unknown	58 (64)
Knowledge of compression strength	36 (39)
Patient use of compression stockings	
Almost daily	26 (26)
2-3 times/wk	11 (11)
3-5 times/wk	21 (21)
Not at all	42 (42)
Hours compression stockings worn when used	(n = 58)
<8 h/d	11 (19)
8-12 h/d	22 (38)
12-16 h/d	17 (29)
>16 h/d	8 (14)
Number of times reason cited for noncompliance with recommended treatment	
Inability to put on the compression stockings	31
Discomfort (too tight)	25
Unclear how the treatment will help	13
Cost	12
Other (too hot, appearance, other medical conditions, physician's lack of emphasis)	11
Patient-reported interventions to increase compliance	
Education regarding tips for putting on the stockings	30
Prescription for a slightly lower strength of compression	26
Financial assistance	14
Additional education from the physician regarding the utility of compression stockings	12

*Data are presented as number (%), as mean ± SD, or as indicated.