



**HAL**  
open science

## Are people more concerned about photoaging than skin cancer when raising awareness about risks of skin exposure?

Brigitte Dreno, Thierry Passeron, Susana Puig, Henry Lim, Chee Leok Goh, Hee Young Kang, Fatimata Ly, Akimichi Morita, Jorge Ocampo-Candiani, Sergio Schalka, et al.

### ► To cite this version:

Brigitte Dreno, Thierry Passeron, Susana Puig, Henry Lim, Chee Leok Goh, et al.. Are people more concerned about photoaging than skin cancer when raising awareness about risks of skin exposure?. *Clinical and Experimental Dermatology*, 2024, pp.11ae225. 10.1093/ced/11ae225 . inserm-04603526

**HAL Id: inserm-04603526**

**<https://inserm.hal.science/inserm-04603526>**

Submitted on 6 Jun 2024

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

# Are people more concerned about photoaging than skin cancer when raising awareness about risks of skin exposure?

**Running head:** Fear photoaging vs skin cancer

Brigitte Dreno,<sup>1</sup> Thierry Passeron,<sup>2,3</sup> Susana Puig,<sup>4</sup> Henry W. Lim,<sup>5</sup> Chee Leok Goh,<sup>6</sup> Hee Young Kang,<sup>7</sup> Fatimata Ly,<sup>8</sup> Akimichi Morita,<sup>9</sup> Jorge Ocampo-Candiani,<sup>10</sup> Sergio Schalka,<sup>11</sup> Liu Wei,<sup>12</sup> Anne Laure Demessant,<sup>13</sup> Caroline Le Floc'h,<sup>13</sup> Delphine Kerob<sup>13</sup> and Jean Krutmann<sup>14</sup>

1. Nantes University, Univ Angers, INSERM, Immunology and New Concepts in ImmunoTherapy, INCIT, UMR 1302, Nantes, France
2. Department of Dermatology, Côte d'Azur University, Nice University Hospital Center, Nice, France
3. INSERM U1065, C3M, Côte d'Azur University, Nice, France
4. Dermatology Department, Hospital Clinic de Barcelona, Barcelona University, Barcelona, Spain
5. Department of Dermatology, Henry Ford Health, Detroit, MI, USA
6. National Skin Centre, Singapore, Singapore
7. Department of Dermatology, Ajou University School of Medicine, Suwon, South Korea
8. Department of Dermatology, Cheikh Anta Diop Dakar University, EPS Institute of Social Hygiene, Dakar, Senegal
9. Department of Geriatric and Environmental Dermatology, Nagoya City University Graduate School of Medical Sciences, Nagoya, Japan
10. Department of Dermatology, Medical Faculty University Hospital of Nuevo Leon, Monterrey, Mexico
11. Medecin Skin Research Center and Biochemistry Department, Chemistry Institute of Sao Paulo University, Sao Paulo, Brazil
12. Department of Dermatology, The General Hospital of Air Force PLA, Beijing, China

1 13. La Roche-Posay International, Levallois-Perret, France

2 14. IUF Leibniz Research Institute for Environmental Medicine, Duesseldorf, Germany,

3  
4 **Corresponding author:** Anne Laure Demessant

5 **Email:** anne-laure.demessant@loreal.com

6  
7 **Funding sources:** As part of the HELIOS project, this work was funded by La Roche-  
8 Posay Laboratoire Dermatologique, France

9 **Conflict of interest:** **Pr Passeron** reports personal fees from La Roche Posay during the  
10 conduct of the study and personal fees from L'Oréal. **Pr. Lim** is an investigator for L'Oreal,  
11 has served as a consultant for La Roche-Posay, and has been a speaker on general  
12 educational session for La Roche-Posay. **Pr. Goh** reports other support from La Roche  
13 Posay during the conduct of the study. **Pr. Kang** reports personal fees from L'Oréal during  
14 the conduct of the study. **Pr. Ly** has nothing to disclose. **Pr. Morita** reports personal fees  
15 from L'Oréal during the conduct of the study. **Dr. Ocampo-Candiani** reports personal fees  
16 from La Roche Posay during the conduct of the study. **Pr. Puig** reports personal fees from  
17 La Roche Posay, during the conduct of the study and personal fees and non-financial  
18 support from La Roche Posay. **Dr. Schalka** has served as a consultant for La Roche  
19 Posay and has participated as a speaker in an educational session for La Roche-Posay.  
20 **Pr. Wei** reports personal fees from La Roche Posay during the conduct of the study. **A.-**  
21 **L. Demessant-Flavigny, C. Le Floc'h, Dr D. Kerob** are employees of La Roche Posay.  
22 **Pr. Dreno** reports personal fees from La Roche Posay International during the conduct of  
23 the study. **Pr. Krutmann** reports personal fees from La Roche Posay during the conduct  
24 of the study and grants and personal fees from L'Oréal.

25 **Data availability:** The data that support the findings of this study are available from the  
26 corresponding author upon reasonable request.

27 **Ethics statement:** This survey was conducted has been carried out according to the  
28 ICC/ESOMAR code of conduct.

29  
30

1 Dear Editor, Chronic UV-induced damages can result in benign conditions like skin aging  
2 (photoaging) or more serious problems like skin cancers (non-melanoma skin cancers  
3 and melanoma). Despite a large literature, multiple awareness campaigns, and a quite  
4 good understanding regarding risks of acute and chronic sun exposure on skin damage,  
5 individuals still have inappropriate behaviours towards sun exposure around the world.<sup>1</sup>  
6 While some people protect themselves by fear of photoaging, others are more  
7 concerned about developing skin cancer. We conducted a study in 17 countries to  
8 assess factors related to photoprotection by fear of skin cancer vs fear of photoaging  
9 and evaluate protection practices in both groups.

10 The survey was conducted online from 28 September to 18 October 2021. The study  
11 population, selected (using the quota method) from the Ipsos online Panel (3,540,000  
12 panellists in 17 countries), included men and women aged 18 years and older from: the  
13 United States of America (US), Brazil, Mexico, Argentina, Canada, Germany, France,  
14 Spain, Italy, United Kingdom, Russia, South Africa, Egypt, China, Japan, Indonesia and  
15 Australia. A total of 17,001 individuals were surveyed. We asked patients to state whether  
16 they fear or not skin cancer or/and photoaging and what their sun protection habits are.  
17 Questionnaires were translated into the appropriate languages for each country and  
18 proofread by a native speaker.

19 There were 9007 females, of which 586 feared only skin cancer (6.5%) vs 2086 (23.2%)  
20 who feared only photoaging and 3686 (40.9%) who feared both. The proportion of those  
21 who feared only skin cancer was 15.7% in Australia, 7% in West Europe, and 4.3% in East  
22 Europe. The proportion of those who feared only photoaging was 26.3% in Asia, 26.2% in  
23 East Europe, and 19.7% in West Europe. (Table 1)

1 The results show that concern about skin cancer was highest in Australia followed by  
2 North America, and lowest in Eastern Europe (Table 1). In fact, Australia has one of the  
3 highest rates of skin cancer in the world, with around 440,000 newly diagnosed cases  
4 every year, due to the country's hot, dry climate, outdoor sporting culture, and globally  
5 high levels of UV radiation.<sup>2,3</sup> In an attempt to change the nation's pro-tanning attitudes,  
6 public health campaigns were launched to increase the population's skin cancer  
7 awareness. On the contrary, concerns about photoaging were lowest in Australia and  
8 highest in Asia and West Europe. Males were significantly more fearful of skin cancer, and  
9 females were more fearful of photoaging. In fact, fear and anxiety about aging have been  
10 increasing amongst females in the past years.<sup>4</sup> Surprisingly, age, phototype and standard  
11 of living had no impact on concerns about skin cancer or photoaging. Taking into account  
12 that subjects with light phototypes are at higher risk of developing skin cancers, there  
13 seems to be an unmet need regarding the proper education of this population, as <10%  
14 were concerned about skin cancer in this survey. Interestingly, compared to subjects  
15 fearful of skin cancer, those fearful of photoaging were more likely to apply sunscreen on  
16 a daily basis, and in sunny days, to wear a hat, sunglasses, clothes for protection, seek  
17 shade, and avoid sun time in midday (Table 2).

18 Nevertheless, there is scarce evidence on differences in sun exposure habits between  
19 individuals with high risk and low risk of skin cancer.<sup>6-8</sup>

20 Studies have shown that raising awareness of the risk factors of skin cancer had no impact  
21 on sun exposure behavior (family history of melanoma, presence of large/atypical nevi  
22 and childhood sunburn)<sup>6</sup>. Our results demonstrated a significant concern about  
23 photoaging compared to skin cancer. Therefore, shedding lights on photoaging could be

1 an important part of future skin cancer awareness campaigns. Addressing people's fear  
2 about photoaging on top of own concern about skin cancer should be assessed, as it  
3 might constitute a paradigm shift in sun exposure habits of people.

## 5 **References**

- 6 1. Auerbach MV, Heckman CJ, Darlow S. To protect or not to protect: examining  
7 reasons for sun protection among young women at risk for skin cancer. *J Behav*  
8 *Med.* 2018 Aug;41(4):528-536. doi: 10.1007/s10865-018-9920-0. Epub 2018 Mar  
9 27. PMID: 29589257; PMCID: PMC6031451.
- 10 2. Deva M, Osborne J, McGlynn A, Soars L, Loghdey S, Beath K, Gonski P, Dwyer P,  
11 Vasudeva N, Joshi P, Deva A. Disease Focused Integrated Care - a New Model of  
12 Healthcare Delivery for the Treatment of Skin Cancer. *Int J Integr Care.* 2023 May  
13 5;23(2):12. doi: 10.5334/ijic.7009. PMID: 37151779; PMCID: PMC10162353.
- 14 3. Lo Presti L, Chang P, Taylor MF. Young Australian adults' reactions to viewing  
15 personalised UV photoaged photographs. *Australas Med J.* 2014 Nov  
16 30;7(11):454-61. doi: 10.4066/AMJ.2014.2253. PMID: 25550717; PMCID:  
17 PMC4259210.
- 18 4. Mahoney B. Aging Anxieties and Disturbed Eating in Female Students: It's not all  
19 About Aging Appearance Concern. *Eur J Psychol.* 2018 Mar 12;14(1):7-27. doi:  
20 10.5964/ejop.v14i1.1390. PMID: 29899795; PMCID: PMC5973514.
- 21 5. Passeron T, Lim HW, Goh CL, Kang HY, Ly F, Morita A, Ocampo Candiani J, Puig  
22 S, Schalka S, Wei L, Dréno B, Krutmann J. Photoprotection according to skin

1 phototype and dermatoses: practical recommendations from an expert panel. *J Eur*  
2 *Acad Dermatol Venereol.* 2021 Jul;35(7):1460-1469. doi: 10.1111/jdv.17242. Epub  
3 2021 May 4. PMID: 33764577; PMCID: PMC8252523.

4 6. Karlsson O, Hagberg O, Nielsen K, Paoli J, Ingvar Å. Difference in Sun Exposure  
5 Habits Between Individuals with High and Low Risk of Skin Cancer. *Dermatol Pract*  
6 *Concept.* 2021 Sep 1;11(4):e2021090. doi: 10.5826/dpc.1104a90. PMID:  
7 34631260; PMCID: PMC8480439.

8 7. Passeron T, Lim HW, Goh CL, Kang HY, Ly F, Morita A, Ocampo-Candiani J, Puig  
9 S, Schalka S, Liu W, Demessant-Flavigny AL, Le Floch C, Kerob D, Dreno B,  
10 Krutmann J. Sun exposure behaviours as a compromise to paradoxical injunctions:  
11 Insight from a worldwide survey. *J Eur Acad Dermatol Venereol.* 2023 Aug 17. doi:  
12 10.1111/jdv.19421. Epub ahead of print. PMID: 37590528.

13 8. Falk M, Faresjo A, Faresjo T, et al. Sun exposure habits and health risk-related  
14 behaviours among individuals with previous history of skin cancer. *Anticancer*  
15 *research.* 2013;33(2):631–8.

16 9. Stratigos AJ, Forsea AM, van der Leest RJ, de Vries E, Nagore E, Bulliard JL, et  
17 al. Euromelanoma: a dermatology-led European campaign against nonmelanoma  
18 skin cancer and cutaneous melanoma. Past, present and future. *The British journal*  
19 *of dermatology.* 2012;167(Suppl 2):99–104.

20 10. Hajdarevic S, Hvidberg L, Lin Y, Donnelly C, Gavin A, Lagerlund M, et al.  
21 Awareness of sunburn in childhood, use of sunbeds and change of moles in  
22 Denmark, Northern Ireland, Norway and Sweden. *European journal of public*  
23 *health.* 2016;26(1):29–35. doi: 10.1093/eurpub/ckv112.

24

1 Table 1: Individuals fearing skin cancer (SC) vs photoaging (PA) vs both

		N	SC		PA		SC+PA		P value SC vs PA
			N	%	N	%	N	%	
		Total	1295	10,0	3413	17,2	6290	36,4	<10 <sup>-3</sup>
<b>REGION (based on weight of each country)</b>	Asia	3001	143	4,8	802	26,3	1371	44,4	<10 <sup>-3</sup>
	West Europe	5000	360	7,0	930	19,7	1740	35,5	
	North America	2000	275	12,9	247	13,2	658	35,6	
	Australia	1000	157	15,7	100	10,0	462	46,2	
	South America	3000	160	4,7	715	25,1	1209	39,7	
	Africa	2000	157	5,4	357	18,6	627	26,5	
	East Europe	1000	43	4,3	262	26,2	223	22,3	
<b>Sex</b>	Male	7994	709	8,9	1327	16,6	2607	32,6	<10 <sup>-3</sup>
	Female	9007	586	6,5	2086	23,2	3683	40,9	
<b>AGE</b>	[16,20[	421	36	8,6	82	19,5	122	29,0	0.2
	[20,34]	5185	417	8,0	1059	20,4	1736	33,5	
	[35,54]	6296	438	7,0	1266	20,1	2506	39,8	
	>54	5099	404	7,9	1006	19,7	1926	37,8	
<b>Education Levels</b>	Low	2672	194	7,3	562	21,0	958	35,9	0.002
	Medium	6157	510	8,3	1157	18,8	2161	35,1	
	High	8172	591	7,2	1694	20,7	3171	38,8	
<b>Standard of living</b>	Low	4597	355	7,7	861	18,7	1546	33,6	0.2
	Medium	5612	416	7,4	1173	20,9	2120	37,8	
	High	5433	418	7,7	1120	20,6	2172	40,0	
<b>Phototype</b>	I,II,III	12875	985	7,7	2568	19,9	4923	38,2	0.58
	IV,V,VI	4126	310	7,5	845	20,5	1367	33,1	

2

3



1 **Table 2: Protection habits in individuals fearing skin cancer (SC) vs photoaging (PA) vs both**

2

3

4

5

6

7

8

9

10

11

12

13

	SC		PA		SC+PA		p value SC vs PA
N (%)	11737		11737		11737		
<b>Sunscreen application every day</b>							
Yes	905	7,7	2480	21,1	4883	41,6	0.06
<b>Wear hat on sunny days</b>							
Yes	763	8,1	1783	19,0	3840	40,9	<10 <sup>-3</sup>
<b>Use clothes for sun protection</b>							
Yes	585	7,7	1553	20,5	3163	41,7	0.8
<b>Wear sunglasses on sunny days</b>							
Yes	764	8,0	1880	19,7	3831	40,1	0.01
<b>Seek Shadow when it's sunny</b>							
Yes	982	7,4	2701	20,5	5131	38,9	0.01
<b>Avoid sun time in the midday sun</b>							
Yes	793	7,1	2365	21,1	4464	39,8	<10 <sup>-3</sup>