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### Introduction

Tattooing has become a widespread phenomenon with about 10 to 30% of tattooed individuals in western countries. Patients with a chronic dermatosis, like psoriasis, may want to get a tattoo. Some may fear complications on their tattoo in relation to their condition and/or treatments. Delivering proper advices about tattooing in this context is challenging for dermatologists because of the lack of scientific data evaluating this risk.

“Tatou” is a 2-part research project that intends to evaluate the risks of tattooing in patients with psoriasis. The 1<sup>st</sup> step aims to evaluate dermatologists' attitudes towards this topic, while the 2<sup>nd</sup> step focuses on patients with psoriasis and tattoos.

### Material and Methods

For the 1st step, we conducted an international cross-sectional study in France, Finland, and Italy, in which we enquired about the experience and opinion of dermatologists about tattooing in patients with psoriasis. They had to complete an anonymous one-page questionnaire.

### Results

We included 468 dermatologists (283 French, 45 Finns, and 140 Italians) from Nov. 2017 to Feb. 2018. Mean age was 46.4 ± 13.0 y. and there were more women (64.3%). The opinion about tattoos was mostly unfavorable (mean: 3.5/10). Only 6% of the dermatologists had tattoos themselves, but 20.5% knew a relative with tattoos. 54% were already questioned by their psoriatic patients about the possibility of getting tattooed, 88.5% thought that tattoos could be a problem in psoriasis, and most of them were opposed to tattooing in these patients, especially in case of active psoriasis (81%). 30% thought that psoriasis treatments could be a problem in tattooed patients; most of them were opposed to tattooing under any psoriasis treatment, especially phototherapy (64.1%) and immunosuppressive treatments (methotrexate: 59.3%, cyclosporine: 63.5%, biotherapies: 63.7%). However, in contrast, only 23.3% had a personal experience of complications on a tattoo in psoriatic patients. Overall, Italians, women, and older dermatologists were more reluctant with tattooing in psoriatic patients.

### Discussion

Our study highlights that most dermatologists are reluctant to support tattooing in patients with psoriasis; 88.5% thought that tattoos could be a problem in psoriasis, 81.0% were opposed to tattooing in cases of active psoriasis, and 49.2% were opposed in cases in which psoriasis was in complete remission. However, only 23.3% had a personal experience of complications with a tattoo in a patient with psoriasis, and most of these were mild complications and easily treatable. A few dermatologists (30%) thought that psoriasis treatments could be a problem in tattooed patients. In contrast, when they were asked their opinion about tattooing concurrent with psoriasis treatments, most of them were reluctant, especially regarding immunosuppressive treatments and phototherapy. Interestingly, French dermatologists were less opposed than Finns and Italians were, but the former were less frequently tattooed themselves. Few severe complications were described after tattooing in our study, which is consistent with the other data in the literature.

### Conclusion

Tattooing has become a widespread phenomenon among young people. Psoriatic patients may also be interested in getting tattooed, but some may fear a risk of complications due to their disease and/or treatments. Dermatologists are mostly reluctant about tattooing in this population. However, there is no scientific support for their opinion. There is thus a real need for further investigations about this subject.

**Table 1. Dermatologists and tattoos. International comparisons**

	All N=468	France N=283	Finland N=45	Italy N=140	p-value		
					Fr/Fi	Fr/It	Fi/It
<b>Age, y</b>	46.4 ± 13.0	47.5 ± 12.8	47.3 ± 13.3	44.1 ± 13.0	0.9	0.01	0.16
<b>Sex, male</b>	164 (35.7)	91 (32.3)	13 (28.9)	60 (45.1)	0.45	0.01	0.06
<b>Type of practice</b>							
Hospital	206 (44.3)	123 (43.5)	22 (48.9)	61 (43.6)	0.81	0.09	0.08
Private office	123 (26.5)	69 (24.4)	10 (22.2)	44 (31.4)			
Both	123 (26.5)	83 (29.3)	12 (26.7)	28 (20)			
Miscellaneous	13 (2.8)	5 (1.8)	1 (2.2)	4 (2.9)			
<b>Opinion about tattooing</b>							
Mean (/10) ± SD	3.5 ± 2.8	3.6 ± 2.6	4.2 ± 2.8	3.3 ± 2.9	0.16	0.36	0.046
Unfavourable	244 (52.6)	142 (50.7)	21 (46.7)	81 (58.3)	0.04	0.02	0.33
<b>Are you tattooed?</b>							
Yes	27 (6.0)	6 (2.1)	5 (11.1)	16 (13.3)	0.002	<0.0001	0.70
<b>Tattoo in relatives</b>							
Yes	96 (20.5)	46 (16.3)	15 (33.3)	35 (25.0)	0.02	0.03	0.27
<b>Consultation dedicated to psoriasis</b>							
<b>Question about tattoo</b>							
Psoriasis	227 (54.0)	125 (44.6)	ND	102 (72.9)	-	<0.0001	-
Other dermatosis	273 (66.4)	171 (62.6)	ND	102 (73.9)	-	0.02	-
<b>Problems with tattooing in psoriasis?</b>							
Yes	133 (30.0)	99 (35.9)	12 (40.0)	22 (15.9)	0.006	<0.0001	0.003
<b>Problems with tattoo, after treatments after psoriatic patients?</b>							
Yes	107 (23.3)	50 (18.2)	12 (27.9)	38 (28.1)	0.30	0.02	0.97

Fr: France; Fi: Finland; It: Italy. ND: not done. Quantitative data are expressed as the means and standard deviations, and qualitative data are expressed as n (%).

**For more information, see:** Grodner C, Kluger N, Fougerousse AC, Cinotti E, Lacarrubba F, Beauchet A, Quiles-Tsimaratos N, Mahé E, for the GEM Resopso. Tattooing and psoriasis: dermatologists' knowledge, attitudes and practices. An international study. *J Eur Acad Dermatol Venereol* 2018 [Epub ahead of print]



**Table 2. Dermatologists and psoriasis. Question: “Independently of your personal position in relation to the permanent tattoo, if a patient with psoriasis asked for your opinion about the possibility of making a permanent tattoo, in the following situations, what would be your position (0 to 10 – 0: no opposition / 10 total opposition)?”**

	All N=468	France N=283	Finland N=45	Italy N=140	P-value		
					Fr/Fi	Fr/It	Fi/It
<b>Active psoriasis</b>							
Mean ± SD	8.1 ± 2.7	7.7 ± 2.7	8.4 ± 2.0	8.6 ± 2.8	0.04	0.001	0.60
Opposition	376 (81.0)	216 (76.9)	37 (82.2)	123 (89.1)	0.46	0.0006	0.002
<b>Psoriasis in complete clearance</b>							
Mean ± SD	5.7 ± 2.7	4.8 ± 3.3	6.2 ± 3.2	7.5 ± 2.8	0.008	<0.0001	0.02
Opposition	228 (49.2)	102 (36.4)	25 (55.6)	101 (73.2)	0.03	0.07	<0.0001
<b>Topical steroids</b>							
Mean ± SD	5.7 ± 3.4	5.5 ± 3.3	6.7 ± 2.8	6.7 ± 3.2	0.009	0.0002	0.95
Opposition	232 (50.5)	121 (43.7)	26 (57.8)	85 (62.0)	0.09	0.002	0.53
<b>Phototherapy</b>							
Mean ± SD	6.7 ± 3.2	6.4 ± 3.3	7.0 ± 2.9	7.4 ± 3.1	0.17	0.002	0.42
Opposition	297 (64.1)	166 (58.9)	30 (66.7)	101 (73.2)	0.43	0.01	0.67
<b>Acitretin</b>							
Mean ± SD	6.5 ± 3.2	6.1 ± 3.3	7.1 ± 2.7	7.3 ± 3.2	0.02	0.0004	0.77
Opposition	263 (57.2)	141 (50.7)	28 (62.2)	94 (68.6)	0.20	0.003	0.37
<b>Methotrexate</b>							
Mean ± SD	6.6 ± 3.2	6.1 ± 3.2	7.2 ± 2.8	7.2 ± 3.2	0.02	0.002	0.89
Opposition	274 (59.3)	151 (54.1)	29 (64.4)	94 (68.1)	0.11	0.02	0.18
<b>Cyclosporine</b>							
Mean ± SD	6.9 ± 3.1	6.6 ± 3.2	7.6 ± 2.5	7.2 ± 3.2	0.03	0.08	0.41
Opposition	292 (63.5)	165 (59.6)	32 (71.1)	95 (68.8)	0.11	0.11	0.29
<b>Apremilast</b>							
Mean ± SD	6.2 ± 3.4	5.7 ± 3.2	7.1 ± 2.8	7.0 ± 3.3	0.003	<0.0001	0.79
Opposition	242 (53.1)	122 (44.5)	29 (64.4)	91 (66.4)	0.04	0.0001	0.49
<b>Biotherapies</b>							
Mean ± SD	6.8 ± 3.2	6.6 ± 3.2	7.5 ± 2.8	7.1 ± 3.3	0.049	0.18	0.36
Opposition	291 (63.7)	165 (60.0)	33 (73.3)	93 (67.9)	0.20	0.13	0.34

Fr: France; Fi: Finland; It: Italy. Quantitative data are expressed as the means and standard deviations, and qualitative data are expressed as n (%).