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Adverse reactions to tattoos in the general population of Denmark

To the Editor: The prevalence of permanent tattooing is increasing,[1,2] along with its harms. Case studies provide mounting evidence of various tattoo-associated skin problems often ascribed to red and black ink.[3] However, as the prevalence of tattoo-related skin reactions in the general population is unknown, the scale of the adverse reactions remains uncertain. Tattooing has been associated with marginalized societal groups,[4] but little is known about the current social characteristics of the tattooed population.

Our baseline cohort study from 2006 compromised 3471 randomly selected adult Danes representative of the general population. Five years later, a follow-up was conducted including 2212 individuals (participation rate 63.7%) who answered questions regarding permanent tattoos, adverse skin reactions, and social characteristics. Permanent tattooing was defined as a tattoo pricked into the skin by a needle. We used SPSS version 22 for descriptive statistics and regression models to estimate odds ratios (ORs) with 95% confidence intervals (95% CIs).

In total, 14.2% had ≥1 tattoo (Table I). Tattoos were more frequent among the young age groups, with 28.6% for those 24-30 years of age and 27.1% for those 31-39 years of age compared with 10.4% in the 40-76 year age group. More men were tattooed than women, and men were younger (median age 20 years) than women (median age 28 years) when they had their first tattoo ($P < .001$). Notably, tattooed individuals were more often unmarried, less educated, and cohabiting than individuals without tattoos. Moreover, they had an unhealthy diet, frequently used tanning beds, and rated their social position as in the middle (Table I).

Adverse reactions to tattoos were reported by 5.9% (18 of 306). The reasons for adverse reactions were eczema/rash (2.9%), infection (1.3%), erosions (1.0%), or all symptoms (0.7%). In most cases, the adverse reactions disappeared without any action; 5.6% of reactions disappeared after medical treatment and 11.1% of individuals had the tattoo removed (Table II). Red ink was involved in most adverse reactions.

Table I. Characteristics of study population from Health2006 cohort and logistic regression analysis with ≥1 tattoo as dependent variable and covariates influencing likelihood of having tattoo as independent variables

Explanatory variables	No tattoos, % (n)	≥1 tattoo, % (n)	*P* value, χ^2 test	OR (95% CI)
General				
All participants, n = 2212	85.8 (1899)	14.2 (313)		
Sex				
Female, n = 1190	89.0 (1059)	11.0 (131)	<.001	Reference
Male, n = 1022	82.2 (840)	17.8 (182)		**1.89 (1.48-2.43)***
Age group, y				
40-76	89.6 (1546)	10.4 (180)	<.001	Referenceφ
31-39	72.9 (283)	27.1 (105)		**3.34 (2.53-4.40)†**
24-30	71.4 (70)	28.6 (28)		**3.65 (2.28-5.84)†**
Skin health				
Itchy skin ever	48.3 (897/1856)	46.5 (140/301)	.558	1.05 (0.81-1.34)
Itchy skin within past 12 months	56.9 (645/1133)	54.9 (100/182)	.616	1.08 (0.78-1.49)
Social characteristics and lifestyle				
Marriage, n = 2204				
Ever married	85.6 (1619/1892)	70.5 (220/312)	<.001	Reference
Unmarried	14.4 (273/1892)	29.5 (92/312)		**1.80 (1.30-2.48)**
Cohabitation, n = 2162				
Never cohabited	42.2 (783/1856)	27.1 (83/306)	<.001	Reference
Ever cohabited	57.8 (1073/1856)	72.9 (223/306)		**1.74 (1.32-2.29)**
Educational level, n = 2132				
High	59.0 (1082/1833)	37.5 (112/299)	<.001	Reference
Low, <7-10 y	41.0 (751/1833)	62.5 (187/299)		**2.92 (2.23-3.84)**
Social position, self-assessed, n = 2198				
High	32.9 (620/1886)	24.7 (77/312)	<.05	Reference
Middle	64.8 (1222/1886)	72.8 (227/312)		**1.74 (1.30-2.32)**
Low	2.3 (44/1886)	2.6 (8/312)		1.51 (0.67-3.40)
Diet, self-assessed, n = 2196				
Healthy	27.0 (508/1884)	20.5 (64/312)	<.05	Reference
Average	64.9 (1222/1884)	66 (206/312)		1.20 (0.88-1.63)
Unhealthy	8.2 (154/1884)	13.5 (42/312)		**1.83 (1.17-2.86)**
Tanning habits				
Use of sunscreen during summer	63.4 (1194/1882)	65.4 (202/309)	.513	0.90 (0.68-1.18)
Use of tanning bed	8.7 (164/1889)	26.9 (84/312)	<.001	**3.89 (2.84-5.34)**

Bold indicates statistically significant by logistic regression analysis ($P < .05$).
CI, Confidence interval; *OR*, odds ratio.
*Adjusted for age.
†Adjusted for sex.

Our study suggests that tattooing is becoming more mainstream, which is in-line with previous literature.[2] We show that 5.9% of tattooed individuals report adverse reactions, which is high considering our focus on well-defined clinical symptoms. Potentially this restricted range of reactions from our questionnaire was a study limitation, resulting in an underestimation of the prevalence of tattoo-associated problems. Further, we do not know when the reactions occurred, and whether they were late events or associated with the pricking itself. A low rate of medical consultation and a habit of consulting the tattooist or asking tattooed friends for advice regarding tattoo-related skin problems have been shown elsewhere.[5] However, the tattooist is not required to report adverse reactions or to provide general risk information. Face-to-face interviews in tattooed subgroups have shown that 42% of 144 tattooed sunbathers in Denmark experienced complaints[5] and 10.3% of 300 tattooed individuals in Central Park, New York, had experienced an adverse reaction.[3] The high number of adverse reactions supports the need for systematic surveillance regarding tattoo-related skin problems. Our findings underline the importance of counseling emphasizing risks associated with red ink.

Table II. Self-reported adverse skin reactions in tattooed population (N = 306)

Adverse skin reaction in tattoo and characteristics	Value, n (%)
Adverse skin reaction in tattoo, self-reported	18 (5.9)
Eczema/rash	9 (2.9)
Infection	4 (1.3)
Erosion	3 (1.0)
All 3	2 (0.7)
Sex, male	9 (50)
Age group, y	
24-30, n = 28	1 (3.6)
31-39, n = 105	6 (5.7)
40-76, n = 180	11 (6.1)
Low educational level (<7-10 years), n = 187	10 (5.3)
Skin health	
Itchy skin ever, n = 140	12 (8.6)
Itchy skin within the past 12 months, n = 100	8 (8.0)
Tanning habits	
Use of sunscreen, n = 202	12 (5.9)
Use of tanning bed, n = 84	4 (4.8)
Color affected by adverse reaction (*P* value = .22, Fisher's exact test)	
Blue	1
Black	4
Red	4
Green	0
Yellow	2
Mix*	5
Other	1
No answer	1
Handling of adverse reaction (*P* = .239, Fisher's exact test)	
Disappeared without any action	12
Disappeared after medical treatment	1
Tattoo had to be removed	2
Other	2
No answer	1

*Blue and red; red, green, yellow, and other; yellow and other; blue, red, green, and yellow; and black, red, green, and yellow.

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Management of primary cutaneous CD4$^+$ small and medium pleomorphic T-cell lymphoma: A retrospective study

To the Editor: Primary cutaneous small and medium CD4$^+$T-cell lymphoma (CD4$^+$ PCSM-TCL) is a rare variant of T-cell lymphoproliferative disorder accounting for 2% of all primary cutaneous lymphomas.[1] Clinically, this lymphoma is generally indolent and presents as a solitary papule, plaque, or nodule predominantly on the face, neck, or upper trunk.[1] On histologic analysis, it is characterized by a dense, nodular or diffuse lymphocytic infiltrate in the dermis. In the 2016 World Health Organization (WHO) classification, CD4$^+$ PCSM-TCL is categorized as a primary cutaneous small- or medium-sized T-cell lymphoproliferative disorder given its indolent behavior and favorable outcomes.[2] However, no standard of care was established due to its rarity.

We retrospectively reviewed a cohort of 684 patients with a diagnosis of cutaneous lymphoma during 2008-2015 under an institutional review board–approved protocol. By using the 2005 WHO and European Organisation for Research