

Skin health and safety at work in Croatian hairdressing and beautician apprentices

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Introduction

- **hairdressers** are at **high risk** for developing occupational **skin diseases** due to **wet work** and **exposure to irritant and sensitising chemicals**
 - symptoms usually start only 2.1 years after the exposure ^[1]
 - the first symptoms occur at an average age of 19 years ^[2]
- **little published data** for **beauticians**, also exposed to **skin hazards** (**sensitising chemicals, infective microorganisms, mechanical irritation**)

[1] Diepgen T L et al. *Int Arch Occup Environ Health* 1999; 72: 496–506.

[2] Uter W et al. *Contact Dermatitis* 1999; 41: 280–286.

Aims

To make a basis for future primary prevention (intervention) studies on hairdressing and beautician apprentices, we wished to determine:

- **the prevalence of skin symptoms**
- effect of **occupational factors** on prevalence of symptoms and quality of skin barrier

Methods: Subjects

Recruitment of 3rd grade apprentices (2015 and 2016)

- presentation and flyers at school
- signed informed consents from apprentices and parents



Hairdressing apprentices (2015)

- response rate 81%
- 101 female apprentices
- median age 17 years
(range 16-19 years)

Samardžić T et al. Contact
Dermatitis. 2016;75(1):25-31.



Beautician apprentices (2015 and 2016)

- response rate 79%
- 76 female apprentices
- median age 17 years
(range 16-19 years)

Macan J et al. Contact Dermatitis
[article in press]

Methods: Questionnaire

Composed of questions from:

- **Nordic Occupational Skin Questionnaire (NOSQ)**

- history of work-related skin symptoms on hands, wrists and forearms

- questions on hand skin dryness

- **EvaHair questionnaire (SafeHair project)**

- work-related exposure of hairdressers to skin hazards

- usage of protective gloves

- similar type of questions for beauticians



Methods Clinical examination of hands

- by occupational health physicians
- symptoms scored using Osnabrüeck hand eczema severity index (**OHSI**)

	RIGHT	LEFT	RIGHT	LEFT
ERYTHEMA				
DESQUAMATION				
PAPULES				
VESICLES				
INDURATION				
FISSURES			0 No fissures	<input type="checkbox"/>
			1 Small (≤ 5 mm) flat (non-hemorrhagic) fissure	<input type="checkbox"/>
			2 Several small or large (> 5 mm) flat fissures	<input type="checkbox"/>
			3 Deep (hemorrhagic) fissure	<input type="checkbox"/>

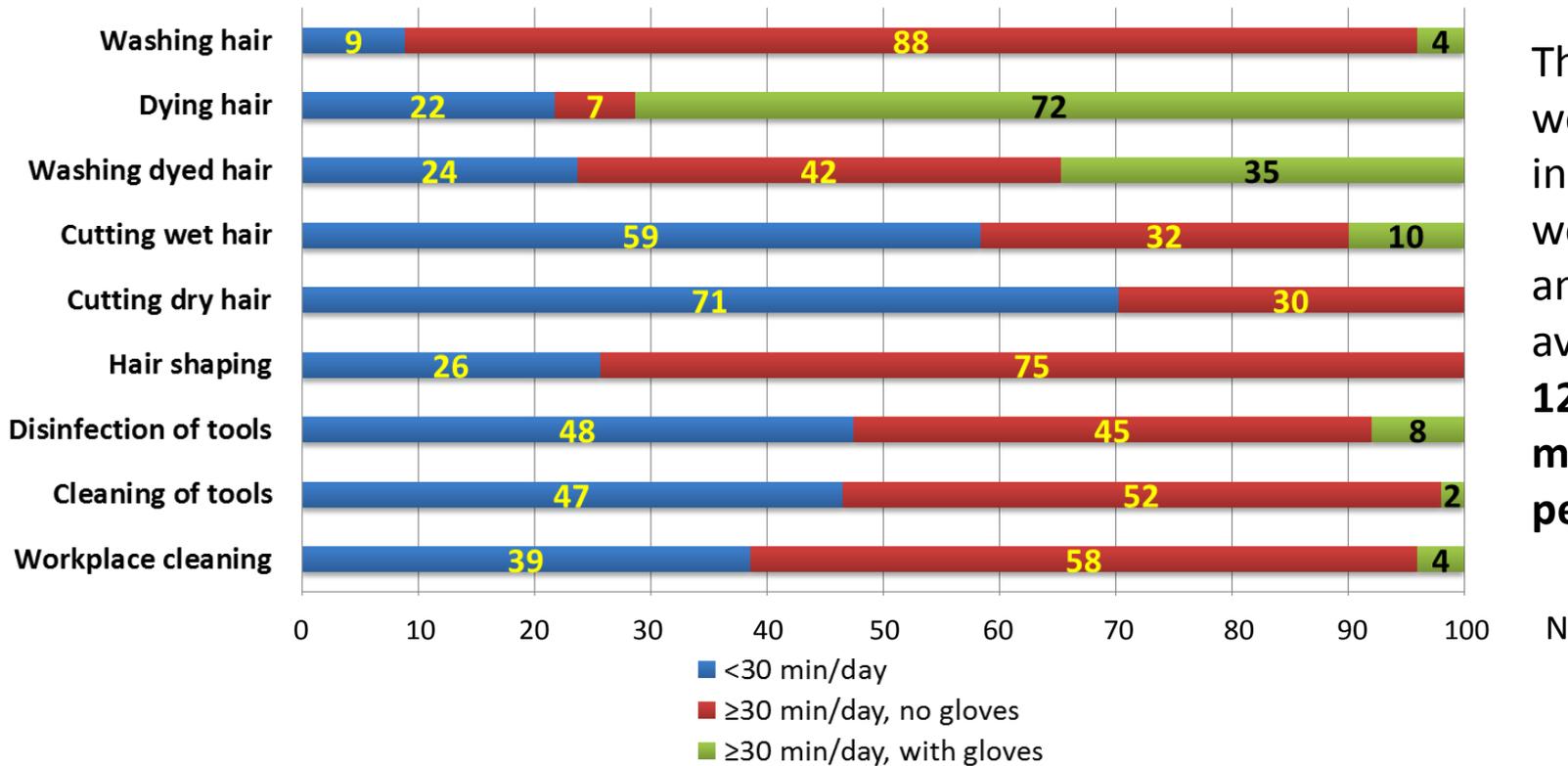
Methods: TEWL

- *transepidermal water loss*
- indicator of **skin barrier** condition



Results

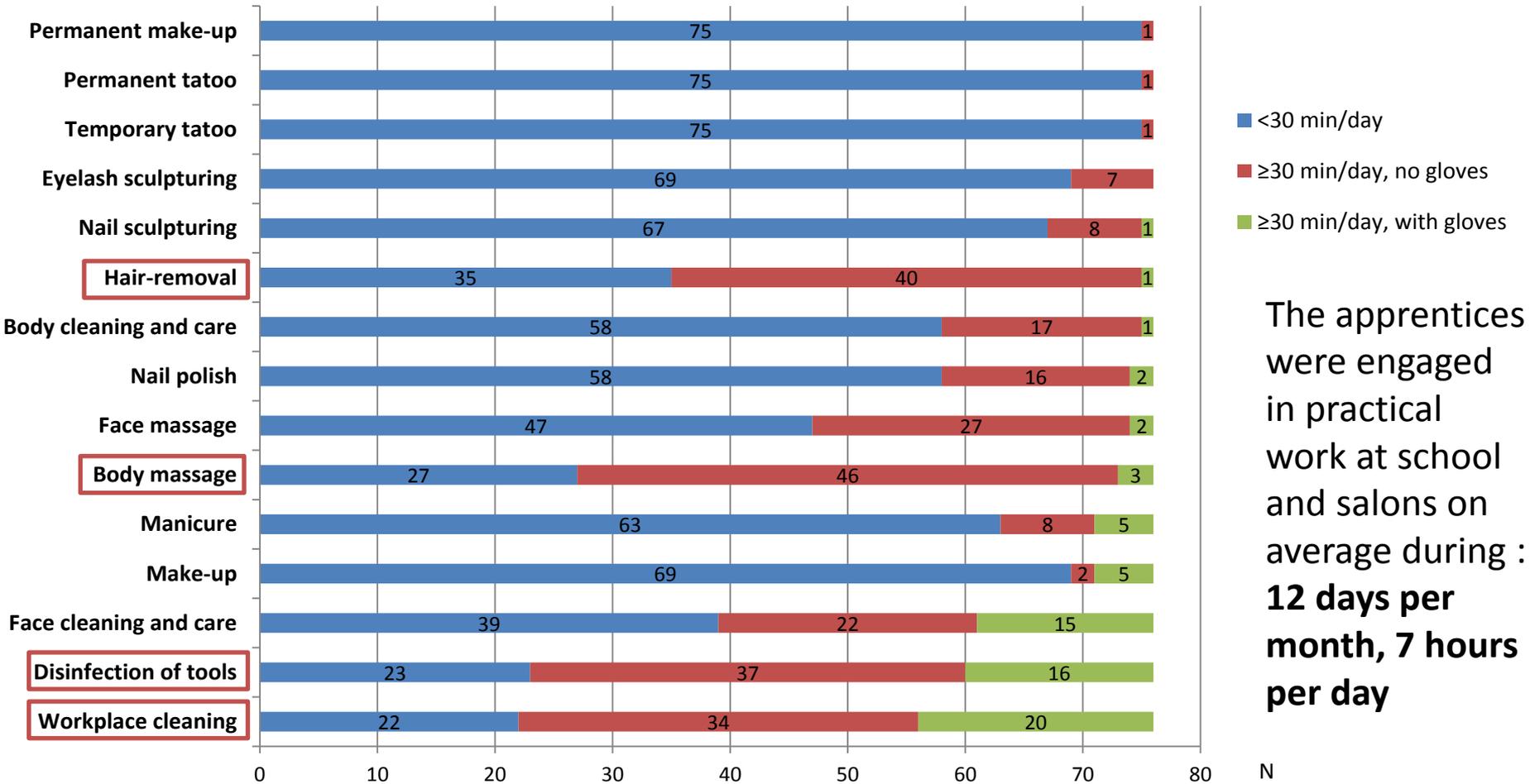
Work tasks and usage of protective gloves among hairdressing apprentices



The apprentices were engaged in practical work at school and salons on average during : **12 days per month, 7 hours per day**

Results

Work tasks and usage of protective gloves among beautician apprentices



Results

Risk factors, symptoms, TEWL

Hairdressing apprentices	Total	Self-reported history of skin symptoms		
		Without symptoms	Eczema or urticarial symptoms	Dry hands
N	101	29	35	37
Washing hands >20 times/day	28 (28)	3 (10)	12 (34)*	13 (35)*
Practical work (hours/month)	96 (84-98)	84 (84-109)	96 (80-96)	96 (84-105)
≥ 1 symptom on clinical examination	40 (40)	5 (17)	16 (46)*	19 (51)*
TEWL hand (g/m²/h)	19.6 (16.7-24.8)	19.1 (16.7-20.9)	20.5 (16.6-27.4)	20.3 (16.3-24.8)
TEWL forearm (g/m²/h)	12.6±4.0	12.5±3.8	13.0±4.4	12.2±3.8

*significant difference (p<0.05) compared to group without symptoms

Positive association only between hand TEWL and washing hands >20 times a day (coef. 0.26, 95% confidence interval 0.07-0.44, P = 0.007)

Results

Risk factors, symptoms, TEWL

Beautician apprentices	Total	Self-reported history of skin symptoms		
		Without symptoms	Eczema or urticarial symptoms	Dry hands
N	76	34	19	23
Washing hands >20 times/day	20 (26)	8 (24)	6 (32)	6 (26)
Practical work (hours/month)	84 (35-120)	86 (35-112)	80 (35-112)	90 (70-120)
≥ 1 symptom on clinical examination	27 (36)	7 (21)*	11 (58)*	9 (39)
TEWL hand (g/m²/h)	18.6 (13.5-23.1)	17.1 (14.5 – 20.2)	18.8 (13.5 - 20.3)	18.8 (15.6 – 22.2)
TEWL forearm (g/m²/h)	12.2 (10.3-15.2)	11.0 (9.6 – 3.3)	13.0* (11.5 – 16.9)	12.6 (10.9 – 13.1)

*significant difference (p<0.05) compared to group without symptoms

Overview of results

Hairdressing vs. beautician apprentices

	Hairdressing apprentices N (%)	Beautician apprentices N (%)
Washing hands >20 times/day	28 (28)	20 (26)
Practical work (hours/month)	96 (84-98)	84 (35-120)
Self-reported eczema or urticarial symptoms	35 (35)	19 (25)
Self-reported dry hands	37 (37)	23 (30)
≥ 1 symptom on clinical examination	40 (40)	27 (36)
TEWL hand (g/m ² /h)	19.6 (16.7-24.8)	18.6 (13.5-23.1)
TEWL forearm (g/m ² /h)	12.6±4.0	12.2 (10.3-15.2)

Similar risk behaviour at workplace and **considerable frequency of skin symptoms in both groups** of apprentices, emphasizing the **need for strengthening knowledge** and safety behaviour at work.

Points for discussion

Usage of protective gloves vs. prevalence of symptoms

Usage of gloves in hairdressing apprentices during hair washing:

Croatia ¹	Australia ²	UK ³	Germany ⁴	Denmark ⁵
4%	6.3%	9%	18.5%	29.6-46.3%

Prevalence of self-reported hand eczema: Croatia 35%, Denmark⁴ 60%

Prevalence of skin symptoms on hands: Croatia 40%, Germany⁵ 55%

[1] Samardžić T et al. Contact Dermatitis 2016;75:25-31; [2] Nixon R et al. Contact Dermatitis 2006;54:112-116; [3] Ling TC et al. Contact Dermatitis 2002;47:227-231; [4] Uter W et al. Curr Probl Dermatol 1995;23:49-55; [5] Bregnhøj A et al. Occup Environ Med 2012;69:310-316; [6] Uter W et al. Contact Dermatitis 1999; 41:280–286.

Points for discussion

Findings on filaggrin mutations

FLG null mutations	2282del4	R501X	R2447X	S3247X
Germany ⁶	6.7%	2.9%		
Germany ¹	5%	2%	0.7%	0.2%
UK ⁴	3.8%	5.8%		
Poland ²	3.79%	1%		
Ireland ⁵	2.6%	2.6%	0.3%	2.2%
Croatia⁶	2.4%	0.2%	0%	0%
Italy ³	0%	0.5%		

[1] Weidinger et al., J Allergy Clin Immunol 2008; [2] Ponińska et al., PLoS One 2011; [3] Giardina et al., Dermatology, 2008.; [4] Palmer et al., Nat Genet, 2006; [5] Sandilands et al., Nat Genet, 2007; [6] Stemmler et al., J Invest Dermatol, 2007; [6] **Sabolić Pipinić et al., Int J Immunogenet 2013**

Continuing efforts

Feedback of results to participants

- overall report was sent to vocational school
- personal clinical report mailed to each subject

Dissemination of results and preventive strategies:

- vocational schools
 - Lectures for teachers
- social partners in hairdressing
 - ESF financed project of the Croatian trade union for workers in personal services („Together we can do it! First step towards an effective social dialogue in Croatia”)
 - lectures, translation of educative material

Continuing efforts



Dissemination of scientific results

- Samardžić T et al. Contact Dermatitis. 2016;75(1):25-31.
- Macan J et al. Contact Dermatitis [article in press]

Submission of project proposal for intervention study in hairdressing apprentices

- Croatian science foundation, submitted in June 2016
- with extensive support of the COST Action TD1206
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