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

Željka Babić, Jelena Macan
Institute for Medical Research and Occupational Health, Zagreb, Croatia
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)

---

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 inform consents from apprentices and parents

Hairdressing apprentices (2015)
• response rate 81%
• 101 female apprentices
• median age 17 years (range 16-19 years)


 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)
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

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

## Risk factors, symptoms, TEWL

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

*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

<table>
<thead>
<tr>
<th>Beautician apprentices</th>
<th>Total</th>
<th>Self-reported history of skin symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Without symptoms</td>
</tr>
<tr>
<td>N</td>
<td>76</td>
<td>34</td>
</tr>
<tr>
<td><strong>Washing hands &gt;20 times/day</strong></td>
<td>20 (26)</td>
<td>8 (24)</td>
</tr>
<tr>
<td><strong>Practical work (hours/month)</strong></td>
<td>84 (35-120)</td>
<td>86 (35-112)</td>
</tr>
<tr>
<td>≥ 1 symptom on clinical examination</td>
<td>27 (36)</td>
<td>7 (21)*</td>
</tr>
<tr>
<td><strong>TEWL hand (g/m²/h)</strong></td>
<td>18.6 (13.5-23.1)</td>
<td>17.1 (14.5-20.2)</td>
</tr>
<tr>
<td><strong>TEWL forearm (g/m²/h)</strong></td>
<td>12.2 (10.3-15.2)</td>
<td>11.0 (9.6-3.3)</td>
</tr>
</tbody>
</table>

*significant difference (p<0.05) compared to group without symptoms
Overview of results
Hairdressing vs. beautician apprentices

<table>
<thead>
<tr>
<th></th>
<th>Hairdressing apprentices N (%)</th>
<th>Beautician apprentices N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washing hands &gt;20 times/day</td>
<td>28 (28)</td>
<td>20 (26)</td>
</tr>
<tr>
<td>Practical work (hours/month)</td>
<td>96 (84-98)</td>
<td>84 (35-120)</td>
</tr>
<tr>
<td>Self-reported eczema or urticarial symptoms</td>
<td>35 (35)</td>
<td>19 (25)</td>
</tr>
<tr>
<td>Self-reported dry hands</td>
<td>37 (37)</td>
<td>23 (30)</td>
</tr>
<tr>
<td>≥ 1 symptom on clinical examination</td>
<td>40 (40)</td>
<td>27 (36)</td>
</tr>
<tr>
<td>TEWL hand (g/m²/h)</td>
<td>19.6 (16.7-24.8)</td>
<td>18.6 (13.5-23.1)</td>
</tr>
<tr>
<td>TEWL forearm (g/m²/h)</td>
<td>12.6±4.0</td>
<td>12.2 (10.3-15.2)</td>
</tr>
</tbody>
</table>

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:

<table>
<thead>
<tr>
<th>Country</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Croatia</td>
<td>4%</td>
</tr>
<tr>
<td>Australia</td>
<td>6.3%</td>
</tr>
<tr>
<td>UK</td>
<td>9%</td>
</tr>
<tr>
<td>Germany</td>
<td>18.5%</td>
</tr>
<tr>
<td>Denmark</td>
<td>29.6-46.3%</td>
</tr>
</tbody>
</table>

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

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

Points for discussion
Findings on filaggrin mutations

<table>
<thead>
<tr>
<th>FLG null mutations</th>
<th>2282del4</th>
<th>R501X</th>
<th>R2447X</th>
<th>S3247X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany(^6)</td>
<td>6.7%</td>
<td>2.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany(^1)</td>
<td>5%</td>
<td>2%</td>
<td>0.7%</td>
<td>0.2%</td>
</tr>
<tr>
<td>UK(^4)</td>
<td>3.8%</td>
<td>5.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poland(^2)</td>
<td>3.79%</td>
<td>1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ireland(^5)</td>
<td>2.6%</td>
<td>2.6%</td>
<td>0.3%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Croatia(^6)</td>
<td>2.4%</td>
<td>0.2%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>Italy(^3)</td>
<td>0%</td>
<td>0.5%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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
- 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 ‘Development and Implementation of European Standards on Prevention of Occupational Skin Diseases (StanDerm)’
Contact information

Željka Babić
zbabic@imi.hr
+385 1 4682 609

Occupational Health and Environmental Medicine Unit
(head of the Unit: Jelena Macan, imacan@imi.hr)

Institute for Medical Research and Occupational Health
Ksavarska cesta 2
10 000 Zagreb
Croatia