

Garment industry in Lithuania: a study of self-reported dermatological problems

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Background. According to our knowledge, there are no official medical statistics about skin problems of Lithuanian textile workers. The aim of the study is to evaluate work related skin problems in this occupational field, their character, and what alterations if any can be carried out.

Materials and methods. A self-reported anonymous survey was carried out in 12 randomly selected textile factories from 6 cities of Lithuania in 2013–2014. Data were analyzed by SPSS v21.0.

Results. 91% of all the employees (551) were females with the mean experience in textile industry of 14.2 years (SD 7.2). The majority (63%) of the respondents were sewing machine operators. The most commonly mentioned risk factors were textile (89.7%) and dust (36.8%) containing different chemical substances that we did not analyze in our study. 83.1% of the respondents had no air conditioning systems at their working place. Atopic skin diseases were declared by 165(30%) workers. 208(37.7%) participants complained about skin problems. Dermatological treatment was received by 190(91.4%) respondents (topical corticosteroids, antibiotics and emollients) and was effective in 74.7% of all cases. Almost all of the respondents (97%) declared having no training about occupational skin problems and skin protection measures during apprenticeship, though 59% of them pointed out it would be desirable. Still, the usage of emollients at work is rather high – 76.6%.

Conclusions. Our study highlighted that improvement is needed in pre-occupational counselling and working conditions.

Key words: risk factors, skin, textile workers

INTRODUCTION

Textile dermatitis resulting from contact with clothing and other textiles is not a rare phenomenon, though its incidence is not very clear due to lack of epidemiological studies (1–2). Sick leave appears to

be frequent in textile industries (3). A turnover rate of employees in textile industry in some countries is higher compared with that of other industries (4).

Dermatological problems in the Lithuanian textile industry are discussed rarely. There were few studies on cancer incidence among textile industry workers in Lithuania. They revealed that the incidence of skin melanoma and other skin tumours is similar or even lower compared to that of

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general Lithuanian population (5–6). The analysis of the morbidity of textile garment industry workers in one of Lithuanian regions, Kaunas, was also performed. It was more concentrated on general health aspects with lack of attention to skin problems. According to the authors, the morbidity is not very high – 1.94 sick leave cases in men and 2.29 in women per 100 workers a year (7). The Lithuanian Registry of Occupational Skin Diseases reports that throughout all occupational fields there were only 4 cases of occupational skin diseases in 2013 (8).

Since 2011 the Centre of Dermatovenereology at Vilnius University Hospital Santariškių Clinics is performing descriptive self-reported by employees studies in various occupational settings with the aim to get data and increase awareness on occupational skin diseases in Lithuania. According to us, textile workers in Lithuania are rarely seeking for dermatological help and official medical statistics about dermatological problems of textile workers are not available. So the period 2013–2014 was dedicated to textile workers in garment industry.

The aim of this study is to evaluate if there are any dermatological work related problems in this occupational field, their character, what an urge for dermatological help is, as well what alterations can be carried out.

MATERIALS AND METHODS

A self-reported survey on occupational skin problems in textile garment industry was carried out in 2013–2014. The survey was conducted in 12 different textile garment production companies that were randomly selected from 6 cities in 4 different (out of 10) districts of Lithuania.

Workers in garment industry who had been directly exposed to textile production environment filled up questionnaires in an anonymous manner by their own and employers' consent. The original questionnaire was created in the Lithuanian language by a dermatologist, later translated into the Russian language because of lack of Lithuanian language knowledge by some textile workers. It consisted of 35 original questions and was designed to describe demographics (age, sex, education, specialization, experience, working hours per week), possible occupational risk factors (textiles, dyes, metals and other materials used in garment industry, dustiness) and occupational skin protection measures which were

used. There were also questions to detect changes of the skin and general health complaints arising after starting working in textile garment industry.

A descriptive statistical analysis was performed with 511 questionnaires using the SPSS v21.0 statistical software programme for Windows. Continuous variables are presented as mean \pm standard deviation, categorical variables are given as frequencies and percentages. A p value <0.05 was considered significant.

RESULTS

The majority of 551 participants (91%) were women. The mean age of the employees was 42.9 years (SD 8.6). The mean duration of employment in textile industry was 14.2 years (SD 7.2) and usually they worked 42.35 hours per week (SD 3.79).

The average duration as an apprentice was 14.7 months (SD 15.0). Occupational skills were mostly acquired at a workplace (44%), more rarely at vocational schools (27%), during the courses (14%) and very seldom on their own. Others did not specify where they acquired speciality skills (11%). 4% of all participants refused to declare their education. The majority of the respondents (97%) declared they had no training on occupational skin problems and skin protection measures during apprenticeship, though 59% of them pointed out it would be desirable.

There were 5% of textile cutters, 63% sewing machines operators, 5% production controllers, 9% ironers. All of them experienced constant direct exposure to textiles (raw, dyed, finished), dust, metals and other risk factors. 18% of all respondents worked in the same environment but in a variable contact with the mentioned hazards. The most common mentioned risk factor for skin was textile (89.7%). 72.7% of the employees knew they were working with synthetics, 3.4% with natural, 21.3% with mixed and 2.6% with other type of textile, while 88.2% of the respondents knew nothing about dyes of the textile they were working with. The second most commonly mentioned health hazard was dust (36.8%), the third one was metal surfaces (20.5%). All the factors in textile garment industry that were affecting the workers' skin for more than 2 hours a day are shown in the Figure. However, 83.1% of the respondents declared that there was no air conditioning system at their working place.

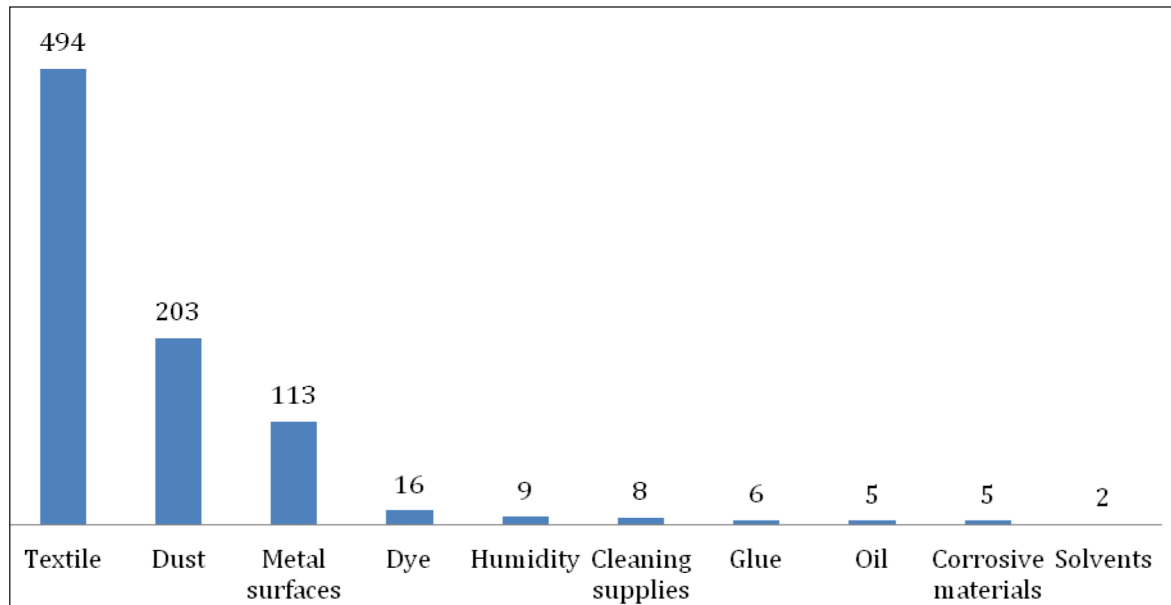


Figure. The number of employees in textile garment industry that were affected by different skin risk factors for more than 2 hours a day

Atopic diseases were declared by 165(30%) workers that participated in our study. Allergic rhinitis was mentioned in 56%, allergic conjunctivitis in 22%, atopic dermatitis in 18% of the cases and bronchial asthma was mentioned by 8% of the respondents.

Present skin complaints were pointed out by 208(37.7%) participants. The majority of affected workers (79.8%) were those working for more than 5 years in this occupational field ($p < 0.05$). The most commonly affected body sites were arms (97.1%), face (74.5%), legs (42.8%), and neck (36.5%). All affected localizations are listed in the Table.

Table. Affected skin sites declared by employees after they start to work in textile garment industry

Site	No. (%)
Arms	202(97.1%)
Face (widespread)	155(74.5%)
Legs	89(42.8%)
Neck	76(36.5%)
Eyelids (only)	67(32.2%)
Hands	66(31.7%)
Feet	48(23.1%)
Waist	24(11.5%)

Signs of acute eczema with a combination of symptoms like erythema, vesicles and itching were indicated only in 1 employee on his face. A combi-

nation of erythema, scaling and itching was declared by 16 workers on eyelids, other parts of the face, neck, hands and arms. All of those 17 respondents with signs of eczema declared having atopy. Almost 28% of the participants had frictional calluses, 17.1% were with skin burns from irons/heat-presses.

A high prevalence of nail changes was noticed in 186(33.8%) employees: 77% of those declared having rough, rippled nails, 16% had thickened nails and 7% had discoloration of the nail plates.

After beginning the work in textile garment industry 320(58.1%) workers started to feel irritation and redness of the eyes (66%), a tickling and sore throat (12 and 3%, respectively), a dry cough (18%) and other changes in oral mucosa (1%).

There was seasonal influence on symptoms in 301(54.6%) respondents with significant worsening during cold seasons in autumn and winter (30 and 43%) and less during holiday season in spring and summer (4 and 23%), respectively.

Textile garment workers do use skin protection measures in daily practice: 76.6% apply emollients, 18.1% use aprons, 12.7% wear protective gloves, 11.1% apply facial masks and 1.1% have fingerstalls. Dermatological treatment was received by 190(91.4%) out of 208 respondents with skin complaints. They were managed with topical corticosteroids (5%), topical antibiotics (12%), and emollients (83%). It was effective in 74.7% of all cases.

DISCUSSION

A comparison between our data and results in other publications is not an easy task because of a limited amount of publications and different methods of enrollment.

There are mostly middle aged women working in textile industry in Lithuania. Our findings are similar to data from other countries, like Italy and United Kingdom (1, 9). According to our study, employees do not have enough knowledge about occupational skin problems and their solutions but they would like to. The reason is the lack of trainings at a working place.

Workers in textile industry are exposed to various hazards during the manufacture process (7). Textile dyes, finish resins, rubber additives and machine oil are the most commonly mentioned culprits of textile allergy (1–2, 10–16). The participants in our study declared that they were working with dyed textiles, but most of them did not know what kind of dyes were used. They were mainly working with synthetic textiles and more rarely with natural ones. Man-made fibers like nylon, spandex, rubber and just few natural fibers like wool and silk have been linked to dermatological problems (17). Textile fibers mainly cause irritant contact dermatitis (16). Metals were often mentioned in our study being in direct contact with skin. Airborne particulates from all these materials in their working environment are very important hazards. There is data that cotton dust is often contaminated with Gram-negative bacteria, which contain endotoxins that might be released into the air during cotton processing (18). Flu, cough, eye and skin infections are the most common diseases among workers affected by particulate matter like textile dust (19). So dustiness, affecting more than 1/3 of the employees in our study, is of concern.

Individuals with atopy are a special risk population for occupational irritant contact dermatitis (20). It is known that irritant contact dermatitis is slightly more frequent than allergic contact dermatitis in textile industry (12–13, 16). More than a third of our investigated employees had atopic history, 30(5%) of them had atopic dermatitis. Atopic disease prevalence (30%) in our survey is similar to data from other studies: 22.4% in those investigated for textile contact dermatitis (1) and

31–35.9% in patients diagnosed with occupational allergic contact dermatitis of different origin (21). We may presume that improvement in pre-occupational counselling about the importance of atopy presence might be preventative for development of occupational textile dermatitis in our country.

Occupational allergic and irritant contact dermatitis as well as contact urticaria to textiles have already been reported (12–13). Contact dermatitis is by far the most common clinical manifestation, especially the chronic one (1, 16). Irritant contact dermatitis is slightly more frequent than allergic contact dermatitis (12). Less frequent manifestations include the following: prurigo-like, purpuric lesions, hyperpigmented patches and papular, papulopustular lesions, with more atypical forms being erythema multiforme-like lesions, nummular-like lesions, lichenifications and erythrodermia, even lymphomatoid dermatitis (1, 13, 22, 23). Practitioners must always be in awareness because of various clinical presentations. The majority (16 respondents) of those 17 participants, who declared signs of eczema in our study, were having signs of chronic eczema. For more accurate data a clinical investigation of those ill individuals would be preferable. When a patient seeks for dermatological help other causes of dermatitis must be considered and excluded, such as atopic dermatitis, psoriasis, and fungal infection (12).

It is also important to discuss affected body locations with the patient. Occupational cases demonstrate common involvement of hands in many studies (12–13, 24). Lack of hand involvement is considered to mean reduced likelihood of work-related dermatitis in textile workers. Face involvement is presumably from airborne particulates, and is usually related to the limited engineering controls, and an inconsistent use of protective equipment (12). Diseased body skin sites that are unprotected with clothes like face, neck, hands and arms, confirm a suspicion that airborne particles might be the reason of this type of affection.

Workers in textile industry do have cough and other respiratory difficulties, as well as ocular problems (25). It is also an important problem in our study because these symptoms were expressed in more than half of the employees. This also might be explained by airborne hazards because good air conditioning was mentioned very seldom.

Seasonal variation of symptoms is known. Our acquired information is similar to data from other studies (26) where health complaints improve in spring and summer months and get worse during cold seasons.

According to our knowledge, there is a lack of data about occupational nail changes in textile industry. We support a suggestion that textile industry workers should be followed for the development of onychomycosis (27) because we found more than one third of the respondents having nail changes. This will be a topic for further investigations of ethiology and diagnosis of these nail changes if they seek for medical help.

The standard treatment of textile contact dermatitis is with topical or systemic corticosteroids according to the current skin condition and strict avoidance of an offending source (13). The workers in our study who had applied for medical help were also mainly treated with topical corticosteroids. Treatment with barrier creams in favour with hydrocarbon creams in comparison with silicone creams lowers the incidence of objective skin lesions (28). A rate of usage of emollients and other skin protection measures in our study is also rather high, despite having no training about occupational skin diseases. However, it is a question for discussion if these measures are sufficient and used properly.

Textile dermatitis has a wide spectrum of typical and atypical clinical presentations that may mimic other skin pathologies, so to make a correct diagnosis there is a need for extensive knowledge of health professionals and availability of the skin patch testing.

CONCLUSIONS

Our study is focusing on self-reported dermatological problems in textile garment industry. The most commonly mentioned risk factors were textile and dust containing different chemical substances which we did not analyze. Uncovered with clothes body sites (face and arms) were mainly affected. It has highlighted that almost all respondents did not have any trainings before the start of the work and most of them would like to have one. Therefore it seems that improvement is needed in pre-occupational counselling, working conditions. A better knowledge of skin protection and

higher rate of seeking dermatological help may potentially lower the incidence of work related skin problems.

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References

1. Lisi P, Stingeni L, Cristaudo A, Foti C, Pigatto P, Gola M, et al. Clinical and epidemiological features of textile contact dermatitis: an Italian multicentre study. *Contact Derm.* 2014; 70: 344–50. <http://dx.doi.org/10.1111/cod.12179>
2. Slodownik D, Williams J, Tate B, Tam M, Cahill J, Frowen K, et al. Textile allergy – the Melbourne experience. *Contact Derm.* 2011; 65: 38–42. <http://dx.doi.org/10.1111/j.1600-0536.2010.01861.x>
3. Bilban M. Occupational Medicine in the Slovene Area. *J Occup Health.* 2005; 47: 193–200. <http://dx.doi.org/10.1539/joh.47.193>
4. Bakirci N, Kalaca S, Fletcher AM, Pickering CA, Tumerdem N, Cali S, et al. Predictors of early leaving from the cotton spinning mill environment in newly hired workers. *Occup Environ Med.* 2006; 63: 126–30. <http://dx.doi.org/10.1136/oem.2005.021352>
5. Kuzmickiene I, Stukonis M, Didziapetris R. [Malignant tumor incidence in employees of the Alytus textile factory (1978–1997)]. *Medicina (Kaunas).* 2002; 38: 1018–25. Lithuanian.
6. Kuzmickiene I, Stukonis M. Cancer incidence among women flax textile manufacturing workers in Lithuania. *Occup Environ Med.* 2010; 67: 500–2. <http://dx.doi.org/10.1136/oem.2009.048058>
7. Ustinaviciene R, Piesine L. [Morbidity of textile industry workers in Kaunas]. *Medicina (Kaunas).* 2007; 43(6): 495–500. Lithuanian.
8. Registry of occupational diseases in Lithuania in 2013 [Internet]. Available from: http://www.hi.lt/images/2013%20m_%20ataskaita%20nauja.pdf
9. Smith J, Gawkrödger DJ. Contact dermatitis from textile and dye allergens requires a high index of suspicion for diagnosis. *Contact Derm.* 2002; 47(2): 112–3.
10. Brookstein DS. Factors associated with textile pattern dermatitis caused by contact allergy to dyes, finishes, foams, and preservatives. *Dermatol Clin.* 2009; 27: 309–22.

11. Hatch KL, Maibach HI. Textile chemical finish dermatitis. *Contact Derm.* 1986; 14(1): 1–13. <http://dx.doi.org/10.1111/j.1600-0536.1986.tb01145.x>
12. Soni BP, Sherertz EF. Contact dermatitis in the textile industry: a review of 72 patients. *Am J Contact Dermat.* 1996; 7(4): 226–30.
13. Lazarov A. Textile dermatitis in patients with contact sensitization in Israel: a 4-year prospective study. *J Eur Acad Dermatol Venereol.* 2004; 18(5): 531–7. <http://dx.doi.org/10.1111/j.1468-3083.2004.00967.x>
14. Coman G, Blickenstaff N, Edwards A, Maibach H. Dermatotoxicologic clinical solutions: textile dye dermatitis patch testing. *Cutan Ocul Toxicol.* 2014 [cited 2014 Mach 31]. <http://dx.doi.org/10.3109/15569527.2014.883403>. Available from: <http://informahealthcare.com>
15. Hatch KL, Maibach HI. Textile dermatitis: an update. (I). Resins, additives and fibers. *Contact Derm.* 1995; 32(6): 319–26.
16. Le Coz CJ. Clothing. In: Jonsen JD, Frosch PJ, Lepoittevin JP, eds. *Contact Dermatitis*. 5th ed. Springer. 2011. p. 793–817.
17. Hatch KL, Maibach HI. Textile fiber dermatitis. *Contact Derm.* 1985; 12(1): 1–11.
18. Paudyal P, Semple S, Niven R, Tavernier G, Ayres JG. Exposure to dust and endotoxin in textile processing workers. *Ann Occup Hyg.* 2011; 55: 403–9. <http://dx.doi.org/10.1093/annhyg/meq084>
19. Tahir MW, Mumtaz MW, Tauseef S, Sajjad M, Nazeeer A, Farheen N, et al. Monitoring of cotton dust and health risk assessment in small-scale weaving industry. *Environ Monit Assess.* 2012 Aug; 184(8): 4879–88. <http://dx.doi.org/10.1007/s10661-011-2309-y>
20. Landeck L, Visser M, Skudlik C, Brans R, Kezic S, John SM. Clinical course of occupational irritant contact dermatitis of the hands in relation to filaggrin genotype status and atopy. *Br J Dermatol.* 2012; 167(6): 1302–09. <http://dx.doi.org/10.1111/bjd.12035>
21. Barbieri MT, Cocco ME, Cocco P. Prevalence of atopic conditions in patients with occupational contact allergic dermatitis: comparison between diagnostic tool. *Med Lav.* 2013; 104(6): 460–6.
22. Tognetti L, Giorgini S, Lotti T. Prurigo-like eczema as an unsuspected presentation of textile dermatitis. *Eur J Dermatol.* 2011; 21: 139–40.
23. Narganes LM, Sambucety PS, Gonzalez IR, Rivas MO, Prieto MA. Lymphomatoid dermatitis caused by contact with textile dyes. *Contact Derm.* 2013; 68(1): 62–4. <http://dx.doi.org/10.1111/j.1600-0536.2012.02164.x>
24. Singhi MK, Menghani PR, Kachhawa D, Bansal M. Occupational contact dermatitis among the traditional ‘tie and dye’ cottage industry in Western Rajasthan. *Indian J Dermatol Venereol Leprol* [serial online]. 2005 [cited 2014 May 6]; 71: 329–32. Available from: <http://www.ijdv.com/text.asp?2005/71/5/329/16783>
25. Panda Lukongo Kitronza J, de Brouwer C. Health problems in textile industry in Democratic Republic of Congo. *Rev Med Brux.* 2010; 31(6): 513–20.
26. Lensen G, Jungbauer F, Gonçalo M, Coenraads PJ. Airborne irritant contact dermatitis and conjunctivitis after occupational exposure to chlorothalonil in textiles. *Contact Derm.* 2007; 57(3): 181–6.
27. Kaçar N, Ergin Ş, Ergin Ç, Arslan Ş, Erdoğan BŞ. Carpet weaving: an occupational risk for onychomycosis? *J Eur Acad Dermatol Venereol.* 2010; 24: 353–55.
28. Duca PG, Pelfini G, Ferguglia G, Settimi L, Peverelli C, Sevosi I, Terzaghi G. Efficacy of the use of barrier creams in the prevention of dermatological diseases in textile dyeing and printing plant workers: results of a randomized trial. *Med Lav.* 1994; 85(3): 231–8.

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TEKSTILĖS PRAMONĖ LIETUVOJE: DERMATOLOGINIŲ PROBLEMŲ TYRIMAS

Santrauka

Įžanga. Mūsų žiniomis, nėra oficialios medicinos statistikos apie Lietuvos tekstilės pramonėje dirbančiųjų odos problemas. Tyrimo tikslas – įvertinti su šiuo darbu susijusias odos problemas, pobūdį bei būdus, kaip jų išvengti.

Metodika. 2013–2014 m. anonimine anketa apklausti 12-os atsitiktinai pasirinktų tekstilės gamyklų šešiuose Lietuvos miestuose darbuotojai. Duomenys analizuoti SPSS v21.0 programa.

Rezultatai. 91 % visų apklaustųjų (551) buvo moterys; jų vidutinė darbo trukmė tekstilės pramonėje – 14,2 metų (SD 7,2). Dauguma (63 %) apklaustų-

jų buvo siuvėjai. Dažniausi rizikos veiksniai – tekstilė (89,7 %) ir dulkės (36,8 %), kuriuos sudaro skirtingos cheminės medžiagos; jų savo tyrime neanalizavome. 83,1 % dirbančiųjų savo darbo vietoje neturėjo oro kondicionavimo sistemos. Atopiniu dermatitu sirgo 165 (30 %) darbuotojų, 208 (37,7 %) apklaustųjų tvirtino turį odos problemų. Gydymas (vietiniai kortikosteroidai, antibiotikai, emolientai) paskirtas 190 (91,4 %) respondentų, jis buvo efektyvus 74,7 % dirbančiųjų. Beveik visi apklaustieji (97 %) teigė, kad nebuvo informuoti apie profesines odos ligas ir odos priežiūrą darbe; 59 % iš jų norėtų tokių mokymų. Emolientų vartojimo statistika darbe yra pakankamai gera, juos tepasi 76,6 % apklaustųjų.

Išvada. Tyrimas atskleidė, kad, norint darbe išvengti dermatologinių problemų, ypač svarbu gerinti darbo sąlygas bei organizuoti mokymus prieš pradėdant dirbti.

Raktažodžiai: oda, tekstilės pramonės darbuotojai, žinios