








Extended documentation for hand dermatitis patients: Pilot study on irritant exposures

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Background: Irritant exposure may be a contributory cause or the sole cause of (occupational) hand dermatitis. However, the documentation of irritant exposures in clinical practice is not standardized.

Objectives: To examine the feasibility and usefulness of a form with different items addressing both occupational and non-occupational irritant exposures in a semiquantitative way.

Methods: Between May 2016 and May 2017, successive patients with work-related hand dermatitis, irrespective of aetiology, were examined in 9 specialized European departments. Department-specific investigation was supplemented with the above proforma. The results were recorded by use of an anonymized secured online documentation system in a pilot study.

Results: Altogether, 193 patients were included; 114 females and 79 males, with a mean age of 40 years (range 18–68 years). The most common occupational group comprised healthcare workers ($n = 35$); occupational exposure of the hands to gloves, dusts and water without detergents of >2 hours/day was seen in 54.5%, 24.4% and 24.3% of patients, respectively. Non-occupational exposures rarely exceeded 2 hours/day.

Conclusions: It is hoped that the set of descriptors will offer a basis for (clinical) epidemiological studies assessing the role of irritant exposures in occupational hand dermatitis, and to support a high level of quality and consistency in daily patient care.

KEYWORDS

contact dermatitis, epidemiology, exposure assessment, hand dermatitis, irritants, occupational skin disease

1 | INTRODUCTION

Diagnostic procedures for the work-up of allergic contact dermatitis (ACD), namely, patch testing and the evaluation of clinical relevance of positive (allergic) reactions, are relatively well standardized.¹ In contrast, a lack of standardized, reliable and meaningful documentation of different irritant exposures is often noted both in clinical routine and in scientific analyses, although some attempts to establish a valid representation at least in the field of epidemiological research,^{2,3} also including irritant exposures in an occupational setting, have been made.⁴⁻⁷ The Nordic Occupational Skin Questionnaire (NOSQ-2002) includes a number of “E”-items comprising glove use and types of gloves, different work materials and the amount of time per day for which these are handled, and some non-occupational exposures.⁸ Concerning medical care, the lack of an established instrument with which to document irritant exposures in a semiquantitative way raises some concern, as irritation, resulting from occupational and/or non-occupational exposures, is important: it often coexists with ACD, and can be the sole cause of dermatitis (irritant contact dermatitis [ICD]). In patients who are patch tested for suspected ACD, ICD may sometimes be a diagnosis by exclusion; however, in general or occupational dermatitis clinics, ICD may actually be more common than ACD.⁹ Hence, to aid diagnosis, a set of useful descriptors of irritant exposures both at work and at home is needed.

With the objective of evaluating the feasibility and usefulness of a documentation system for irritant exposures, both occupational and non-occupational, a pilot study was initiated by members of the COST action consortium “StanDerm”. The concept and results obtained with this system are presented in this article.

2 | METHODS

During the study period (May 2016 to May 2017), successive patients with work-related hand dermatitis (eczema), irrespective of aetiology, were eligible for inclusion. Eligibility of patients was not limited to only those with a formal occupational contract, or only those aged ≥ 18 years (effectively, no patient aged < 18 years was included). However, being a housewife/-husband and pure leisure-time activities were not considered to be “occupational” activity. Moreover, inclusion was not limited to those patients in whom occupational irritant exposures were a priori suspected to be relevant. For documentation, paper forms were primarily used, comprising the items shown in Table S1. When the evaluation of a patient was finished, the data were entered into the study server (see below). The extended documentation was anonymous. It was envisaged that each participating department should contribute at least 20, ideally 30, patients to achieve a useful sample size. The study was undertaken on the basis of an audit of clinical practice.

The way in which the questionnaire instrument was used within the departmental workflow was not strictly defined, and was adapted to the local situation in terms of causing the least additional work and disruption. The following options could be used: (1) sending or handing the form to a patient prior to the actual consultation, for example, to be filled in when waiting or at home—in this case, the questionnaire was checked at the consultation either by a nurse or by the doctor,

with amendments and supplements as necessary; (2) using the form as the basis for a structured interview, filled in by a nurse or other associate medical professional before (preferably) or after the medical consultation; or (3) filling in the form during the interview when the patient’s history was taken by the doctor.

Online documentation via the https protocol on a web-server hosted at the Department of Medical Informatics, Biometry and Epidemiology with department-specific strong authentication was implemented with an institutional license of SoSci (<https://www.soscisurvey.de/index.php?page=home&l=eng>). The form used (Table S1) is, in large part, based on the validated questionnaire items used by a Swedish population-based study assessing “wet exposures”.^{2,3,6,7} The questionnaire items on exposure types were slightly modified as compared with References ³ and ⁸, mainly by adding some, and subdividing other, wet work exposures. The exposure levels were based on 5 categories of duration of various exposure types, and 3 categories of number of hand washings per day (Table 2).² “Hand washing” was disregarded in the questions on duration of exposure, to avoid overlap of reporting. All items were to be filled in first in an occupational context, and second in a non-occupational context. An online video tutorial was provided to study participants to explain and standardize data entry. After exportation of data, further data management and analysis were performed with the statistical software R (version 3.4.3¹⁰ [<http://www.R-project.org/>]). *P* values of $< .05$ were considered to be significant.

3 | RESULTS

Altogether, 193 patients with occupational hand eczema were included in this analysis. The numbers per department ranged from 6 in Barcelona to 37 in Zagreb; the average number per department was 21.4, and thus within the target. Some important characteristics of the patients are shown in Table 1, stratified for sex. Missing data are mostly attributable to technical difficulties in linking data captured via the online system and via other systems used for routine documentation.

The main focus of the present analysis is the detailed presentation of the amount of irritating exposures according to the items detailed in Table S1. The amount of missing information was acceptable, in terms of 11 patients with a consistent absence of information on occupational irritation, interpreted as an absence of occupational irritation (non-occupational irritation had been documented in these cases). The results are shown in Table 2. Concerning occupational glove exposure, only 45 patients were exposed for less than half an hour to both plastic or rubber, or other types of gloves. In the subgroup of patients whose skin was heavily exposed to dusts ($n = 32$), the majority, namely, 21, did not wear plastic or rubber gloves to a similar extent, thus apparently allowing for some unprotected dust exposure.

Heavy irritant exposure of > 5 hours (h)/day (d) at the workplace was most frequently found concerning occlusive glove use (23.3%), exposure to dust (18.2%), contact with other liquid or non-solid chemicals (15%), and water without detergents (13.3%). Extensive non-occupational exposure (> 5 h/d) was mainly caused by caring for children aged < 4 years or disabled persons (5.9%). Another typical non-occupational irritant exposure was contact with food, which was reported by 38.9% to occur for at least half an hour per day.

TABLE 1 Characteristics of the clinical sample of hand dermatitis patients (N = 193) obtained in 9 departments in 8 European countries, stratified for sex. Percentages were calculated on the basis of non-missing data (missing data are thus assumed to be missing completely at random). Up to 2 diagnoses may be attributed to a patient

	Female		Male	
	n = 114		n = 79	
	n	%	n	%
Atopic dermatitis ¹	31	42.5	21	35.0
Allergic contact dermatitis ²	59	71.1	23	48.9
Irritant contact dermatitis	22	26.5	24	51.1
Atopic eczema, "dyshidrosis"	17	20.5	14	29.8
Face involvement	8	8.5	9	15.5
Arm involvement	6	6.4	4	6.9
Foot involvement	5	5.3	1	1.7
Occupational group				
Healthcare workers ³	28	27.5	7	10.4
Office workers ⁴	14	13.7	2	3.0
Hairdressers (code 5141)	15	14.7	0	0
Cleaners, household ⁵	12	11.8	1	1.5
Metal workers ⁶	2	2.0	14	20.9
Construction workers ⁷	3	2.9	13	19.4
Food handlers ⁸	4	3.9	7	10.4
Service NEC ⁹	9	8.8	3	4.5
Agriculture ¹⁰	3	2.9	3	4.5
Plastics, rubber and related ¹¹	5	4.9	2	3.0
	Median	Q1-Q3	Median	Q1-Q3
Age (years)	42	27-51	41	29.5-52.5

Abbreviation: NEC, not elsewhere classified.

¹n = 4 with "unknown" atopic dermatitis status and n = 5 with missing information.

²Including n = 4 patients with contact urticaria.

³Comprising ISCO-08: group 2200 and group 3200.

⁴Comprising ISCO-08: 1000-2160; 2300-3150; 3300-3410; 3500-4400.

⁵Comprising ISCO-08: 5150; 7133; 9110-9120.

⁶Comprising ISCO-08: 7210-7234; 8121.

⁷Comprising ISCO-08: 3120; 7110-7132; 9310-313.

⁸Comprising ISCO-08: 5120; 7511-7516; 8160; 9410.

⁹Comprising ISCO-08: 0; 5130; 5160; 5200-5400; 8300-9120; 9330; 9510-9620.

¹⁰Comprising ISCO-08: 6111-6130; 9210-9214.

¹¹Comprising ISCO-08: 8130-8159.

The frequency of hand washing per day (Table S1, top) was estimated, in an occupational context, to be 1-10 times for 54.5% of study participants, 11-20 times for 20.8%, and >20 times for 24.7%. The occupational groups (as used in Table 1) with the highest share of >20 hand washes per day were hairdressers (64.3%), cleaners (50%), food handlers (45.5%), and other service workers (44.4%), whereas such frequencies were not observed in construction, metal or plastics workers. In a non-professional context, these frequencies were much lower, namely, 85.2%, 13.8%, and 1.1%, respectively. The frequencies of hand washing occupationally and non-occupationally were weakly correlated (Kendall's tau-b: 0.27).

The association between the categorized frequency of hand washing and duration of "contact with water without detergents" in the occupational and the non-occupational contexts, respectively, is shown in Figures 1 and 2, respectively. A comparison illustrates that (1) exposure

to water of >5 hours is mostly seen in an occupational context, and (2) only 2 participants claimed to wash their hands >20 times per day when not at work. Moreover, whereas the correlation between the 2 items is significant, if weak in the occupational context, it is even weaker and non-significant in the non-occupational setting.

4 | DISCUSSION

The present analysis of an extension to the routine documentation of patients with occupational hand dermatitis addresses several aspects that need discussion: (1) general feasibility, which covers several aspects, including comprehensibility and acceptability of the form as such, and technical aspects of entering data into the pilot system, (2) usefulness of the information obtained, and (3) perspectives concerning future use. These aspects will be discussed in the following sections.

4.1 | Feasibility

The tool has been found to be simple to understand, and can be filled in by the patient (and then checked by the nurse or clinician, until a self-administered version has been fully validated) or by the clinician. According to user judgement, the questionnaire offers a standardized evaluation of occupational and non-occupational exposure to irritants, thereby helping both patients and clinicians to identify and quantify different irritant exposures and the relative contributions of occupational and non-occupational exposures. This can then be used as a starting point for their reduction, where indicated. Moreover, it was felt the proforma helped to ensure that both physical and chemical irritants were considered, and that it helped to inform the final diagnosis in a structured way based on quantitative data. The standardization of individual exposure assessment also enables follow-up of a patient's irritant exposures along with their symptoms and clinical course.

The above considerations refer to the instrument as such. Somewhat separately, the online documentation system used also has an aspect of feasibility. However, as it is not our intention to promote the system used, a discussion of the technical aspects is of little general interest. It is recommended, given that the added information is found to be useful and worth the additional effort of documentation, to incorporate the form into the clinical documentation system used locally or in any surveillance network.

4.2 | Information

The main objective of the present study was to assess the practicability of an extended documentation of irritant exposures, largely along the lines of a set of items that have already been used in different epidemiological studies,^{4,5} mainly in references 2, 3 6, and 7. We fully acknowledge the fact that the data were not collected with a systematic, well-planned sampling process. However, there is no reason to assume that cases have been selected—across all departments, in particular—for specific occupations, morbidity/morphology, or "simplicity" vs "complexity" of a clinical case. Hence, it appears reasonable to descriptively examine the results.

TABLE 2 Irritant exposures of the hands as documented in the present study involving 193 patients with occupational hand dermatitis as 100%.

Exposures (skin contact)	Occupational					Non-occupational				
	Not at all	<½ h/d	½-2 h/d	2-5 h/d	>5 h/d	Not at all	<½ h/d	½-2 h/d	2-5 h/d	>5 h/d
Contact with water without detergents	20.4	34.3	21	11	13.3	13	62.7	23.3	1	0
Skin disinfectant (alcohol-based)	47	33.1	13.8	3.9	2.2	85	14.5	0.5	0	0
Surface disinfectant	50.5	30.8	13.7	3.8	1.1	76.6	20.8	2.1	0.5	0
Contact with detergent, cleaning ¹	37.6	27.6	22.7	3.3	8.8	26.6	54.7	18.8	0	0
Contact with other liquid or non-solid chemicals	60.6	13.9	6.7	3.9	15	89.6	7.8	1.6	1	0
Contact with food	62.8	15.6	7.8	5	8.9	14.7	46.3	37.4	1.1	0.5
Gloves, plastic, or rubber	19.9	14.2	11.4	31.2	23.3	55	29.3	14.1	1	0.5
Other gloves ²	74.1	2.4	5.3	8.8	9.4	88.6	6.5	2.2	1.1	1.6
Dusts ³	67	3.4	5.1	6.2	18.2	89.2	7.6	2.2	1.1	0
Cold	73.4	9.8	7.5	4	5.2	92.9	4.9	2.2	0	0
Heat	72.4	7.5	4.6	5.2	10.3	93.5	4.3	1.1	0	1.1
Friction ⁴	72	5.7	6.3	4	12	94.6	4.8	0.5	0	0
Special environmental conditions ⁵	91.9	1.7	1.2	1.2	4.1	97.8	1.6	0.5	0	0
Care of children aged <4 years or disabled persons	87.4	1.7	1.1	3.4	6.3	85.4	1.6	5.9	1.1	5.9
Other hobbies ⁶	-	-	-	-	-	90.1	7	2.3	0.6	0
Hand washing (times per day)	1-10		11-20		>20	1-10		11-20		>20
	54.5		20.8		24.7	85.2		13.8		1.1

Abbreviations: d, day; h, hours.

¹Except hand washing; see separate item (bottom).

²The following "other" glove types worn in the job were documented: cotton (n = 11), (textile) leather (n = 10), textile with rubber or polyurethane coating (n = 5), and metal mesh (in a meat cutter; n = 1).

³The following occupational dusts were documented: metal (n = 9), construction material (n = 7), plastic or rubber (n = 4), paper, cardboard (n = 3), "dirt" (n = 3), plant/animal dust, and woods (n = 2 each). In single cases, flours, drugs (in a pharmaceutical factory), powder from latex gloves, mildew, persulfates, sugar and textiles were mentioned.

⁴As sources of occupational frictional stress to the skin, paper towels (n = 4), giving massages, metal handling and textiles (n = 2 each) and, in single cases, abrasive metal surface, aircraft carbon brakes, carpenter work, cement, lifting and moving furniture parts were mentioned.

⁵The following special environmental conditions were documented: "dry atmosphere", dryness/low relative humidity (n = 2), dust, high humidity (n = 3), oil mist, and work outside.

⁶The following hobbies were mentioned: bicycling and swimming (n = 3 each), and carpentry, construction work, gardening, hunting and berry picking, soldering, and general sports in single instances.

First, the pattern of "contact with water without detergents" is interesting, in that more patients had some contact in their leisure time than occupationally, perhaps because of a lack of protective gloves at home. However, the extent was clearly higher in the occupational context. The correlation between such self-reported contact and the frequency of hand washing is marked (Figures 1 and 2); however, information on the frequency of hand washing alone does not appear to be a valid representation of overall skin contact with water. A Swedish birth cohort study used a slightly different categorization, focusing on frequency and not duration: "How many times a day are your hands exposed to water?" The possible responses were "not at all", "1-10 times", "11-20 times", "21-30 times", and ">30 times". Among 3091 adolescents (ie, not patients), exposures of >10 times per day in 28.7% and >20 times per day in 3.1% were found,¹¹ which is certainly different from what was found in the present adult, diseased and, particularly, working part of the population. In comparison, "contact with food" clearly reflects the major exposure during everyday life, in contrast to the relatively low number of employees working as food handlers (Table 1). However, skin contact with food comprises a broad arena of exposures, ranging from washing fruit or vegetables, to being exposed to possibly acid, irritating and even potentially sensitizing food juices. Therefore, the question may be somewhat non-specific, and it certainly seems advisable to record

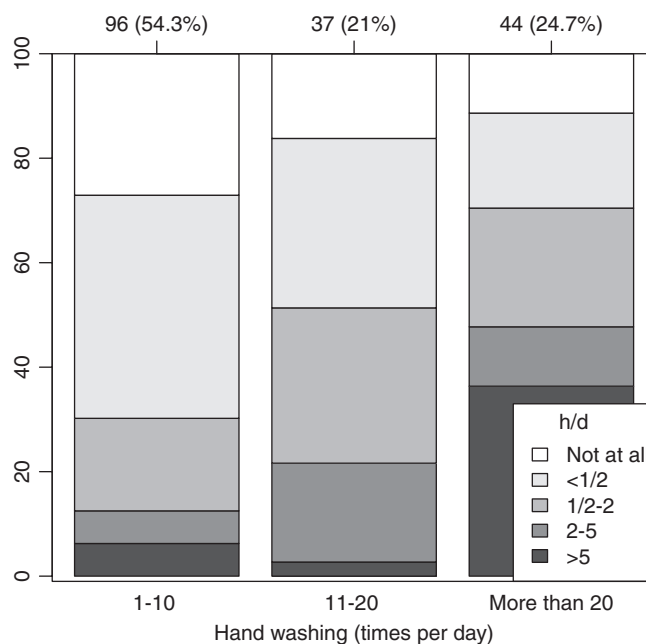


FIGURE 1 Association between number of daily occupational hand washes and duration of occupational contact with water (without detergents). Categorical correlation as quantified with Kendall's tau-b is 0.32, $P < .0001$. d, day; h, hours

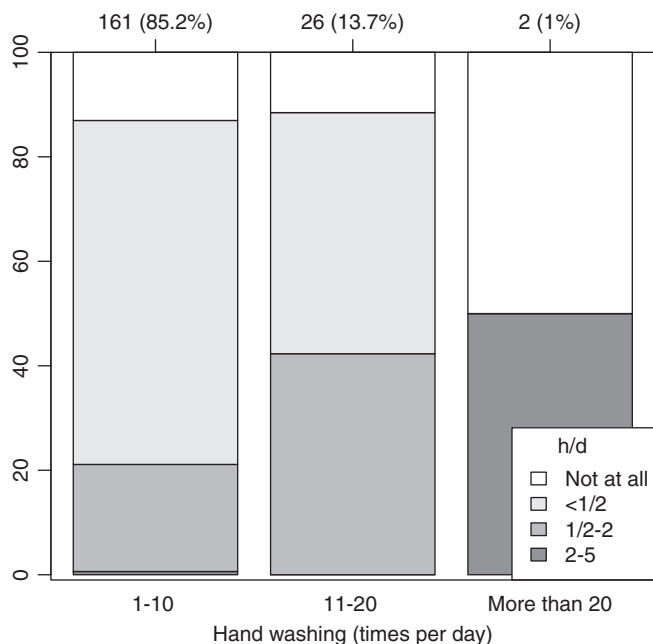


FIGURE 2 Association between number of daily non-occupational hand washes and duration of non-occupational contact with water (without detergents). Categorical correlation as quantified with Kendall's tau-b is 0.13, $P = .071$. d, day; h, hours

more specific detail here, including a full diagnostic work-up regarding type I sensitization where appropriate.

Exposure to gloves is evidently strongly related to occupation, with ~20% not being exposed to gloves. This appears to be a high proportion, as all of the patients included have hand eczema, and almost everybody should be expected to use gloves at least sometimes. Possibly, patients assumed that daily wearing of gloves fell into the "less than half an hour per day" category, and checked "not at all" if they did not use gloves on a daily basis. Interestingly, a notable proportion of "office workers" were exposed, possibly because of intermittent tasks beyond what is normally considered to be office work (data not shown). Prolonged glove wearing in a cleanroom was not associated with mid-term or long-term irritation of the skin¹²—notwithstanding the risk of allergy to natural rubber latex and rubber additives, respectively, resulting from wearing rubber gloves. However, as a characteristic of cleanroom work, it is possible that occlusive irritation by residues of liquid soap, shampoo or other more or less irritating products is not an issue. In contrast, these residues occur in most other fields, such as hairdressing, cleaning, health services, and food processing, where others have reported that glove occlusion enhances skin barrier damage and the susceptibility to skin irritation by detergents.¹³ Hence, the significance of glove wearing needs to be interpreted in the context of the individual occupational setting.

It is interesting to note that ~18% of patients with occupational hand dermatitis are heavily (>5 h/d) exposed to various types of dust (see footnotes to Table 2). Evidently, the significance of such exposure needs to be individually checked against protective measures, namely, wearing of (sufficiently) protective gloves. The present results do indicate some gaps in protection; however, again, the significance of the contribution to skin irritation needs to be clarified case-by-case.

Skin irritation caused by friction to such an extent that it contributes to hand eczema is possibly rare, but possibly also underestimated.¹⁴ At any rate, a relatively high proportion of patients with hand dermatitis (Table 2) report exposure to friction for several hours per day. In this group, technicians or manual workers in construction, wood and leather production dominated (data not shown); therefore, the results seem to be plausible. However, in this context, the problem of a recall bias creating the phenomenon of "reversed causality" must be considered: it may be only because of pre-existing hand dermatitis (for other reasons) that patients note friction, and even a detrimental effect of friction, on their hand dermatitis—perhaps particularly if filling in the form by themselves, whereas careful investigation by an experienced dermatologist may eliminate this potential bias.

Experience in the present study indicates that exposure to heat and cold is difficult to assess, as clear definitions are lacking. Therefore, further improvement of these items should include pragmatic definitions, including glove use in cold surroundings (cold storage rooms, cold climates, and winter). Moreover, there are probably differences between high and low indoor or outdoor temperatures and handling cold and warm or hot objects. At least cold ambient air, which is always accompanied by low absolute humidity, because of the limited water-holding capacity of cold air, has been clearly shown to entail a significant risk of skin irritation, as observed during a cold continental winter.¹⁵ Also indoors, impairment of the epidermal barrier becomes clinically visible if the relative humidity is <10%.¹⁶

In the realm of non-occupational (irritant) exposure, both everyday exposures such as preparation of food, cleaning, care of small children, disabled elderly or otherwise disabled persons and individual hobbies may contribute to irritant or mixed-aetiology hand dermatitis. Regarding "other hobbies", in 90% of patients no particular hobby had been documented, or, in other words, only in 10% of patients were such hobbies deemed to be potentially significant for hand dermatitis and thus recorded. However, the question remains of whether there is deliberate under-reporting, in view of, perhaps, a certain tendency of patients to attribute skin lesions solely or mostly to occupational exposures. This may be a phenomenon in those European countries in which medical care and compensation are linked to (formally proven) occupational causation.¹⁷ To conclude, it is necessary to obtain information on, and document, both occupational and non-occupational irritant exposures. This proforma provides a basis for initial investigation, and stimulates further questions when these are relevant to the patient's dermatitis.

4.3 | Future perspectives

The form as used in the present study can, of course, be adapted to be used in certain settings. For instance, it could be shortened if used in epidemiological studies, in which a compromise in degree of detail has often to be accepted to achieve sufficient response by participants. Conversely, in a specialized occupational dermatology clinic, additional information concerning, for example, the types of soaps and (abrasive) hand cleaning products used, or the specific types of gloves used, could be added, as partly discussed above. This latter addition would possibly make it easier for the patient to fully recall the (various) types of gloves used, which may also be relevant from an

allergological point of view (if allergic contact dermatitis or contact urticaria caused by glove material is suspected). As a trade-off, the longer a form is, the lesser its acceptability, and the more likely it is that its users will start to skip items. The filled-in form can be discussed with the patient to identify areas needing intervention, that is, improved preventive measures,¹⁸ and also be used in standardized follow-up (see above) to monitor the success of recommended measures.

Evidently, depending on the setting in which it is used, the form will possibly never be a wholly self-administered questionnaire, although, possibly with some redesign and more explanations, such a version could probably be developed from the present version. It has been found that some questions are somewhat difficult to interpret for a patient, and need clarification (eg, referring to exposure to dust, environmental conditions, and friction); therefore, an interview by a physician, a specialized nurse or an occupational hygienist might yield more valid information. Indeed, for the initial use in the present trial, checking and corrections by the physician, nurse or hygienist going through the form with the patient were considered to be appropriate (and were, in fact, recommended). As a future perspective on a more technical level, data capture could probably be supported by developing and using a suitable smartphone, tablet, or computer “app”.

One benefit of the use of structured information as suggested in the present form (Table S1), given that this is understandable, relevant and comprehensive enough, is the possibility of using the form as a “checklist”. Whereas for residents, trainees and other less experienced medical staff the benefit will be in terms both of an educational value and of documenting the full scope of relevant information for a given patient, the latter aspect of standardized, complete documentation will probably also convince the experienced clinician. Beyond the value of potentially more complete, and certainly more standardized, patient documentation (which will, of course, always be supplemented by critical “non-standardized” information), the collection of such data in a department, or eventually in a research network, may enable a more in-depth analysis of irritant exposures as associated with certain occupations, disease patterns, therapeutic or preventive outcomes, etc.¹⁹

5 | CONCLUSION

The set of descriptors for irritant exposures appears to be comprehensive and standardized. Its use is expected to enable fuller and more uniform clinical case-by-case documentation—evidently supplemented and specified by any further information needed—supporting a high level of quality and consistency in daily patient care. Additionally, the items are expected to be useful as a basis for scientific, (clinical) epidemiological studies assessing the role of irritant exposures in occupational hand dermatitis.

Conflict of interest

W.U. has accepted travel reimbursement and honoraria for presentations given to cosmetic industry associations, and has received a lecture fee from mixed dermato-pharmaceutical sponsors for an

educational lecture on contact allergy. M.P. has received a lecture fee from Leo Pharma and the Finnish Cosmetic, Toiletry and Detergent Association. The other authors declare no potential conflict of interests.

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REFERENCES

1. Johansen JD, Aalto-Korte K, Agner T, et al. European Society of Contact Dermatitis guideline for diagnostic patch testing—recommendations on best practice. *Contact Dermatitis*. 2015;73:195-221.
2. Anveden I, Wrangsjö K, Järholm B, Meding B. Self-reported skin exposure—a population-based study. *Contact Dermatitis*. 2006;54:272-277.
3. Anveden I, Lidén C, Alderling M, Meding B. Self-reported skin exposure—validation of questions by observation. *Contact Dermatitis*. 2006;55:186-191.
4. Uter W, Pfahlberg A, Gefeller O, Schwanitz HJ. Hand dermatitis in a prospectively-followed cohort of hairdressing apprentices: final results of the POSH study. Prevention of occupational skin disease in hairdressers. *Contact Dermatitis*. 1999;41:280-286.
5. Jungbauer FH, Lensen GJ, Groothoff JW, Coenraads PJ. Exposure of the hands to wet work in nurses. *Contact Dermatitis*. 2004;50:225-229.
6. Anveden I, Meding B. Skin exposure in geriatric care—a comparison between observation and self-assessment of exposure. *Contact Dermatitis*. 2007;57:253-258.
7. Anveden Berglind I, Alderling M, Järholm B, Lidén C, Meding B. Occupational skin exposure to water: a population-based study. *Br J Dermatol*. 2009;160:616-621.
8. Susitaival P, Flyvholm MA, Meding B, et al. Nordic Occupational Skin Questionnaire (NOSQ-2002): a new tool for surveying occupational skin diseases and exposure. *Contact Dermatitis*. 2003;49:70-76.
9. Higgins CL, Palmer AM, Cahill JL, Nixon RL. Occupational skin disease among Australian healthcare workers: a retrospective analysis from an occupational dermatology clinic, 1993-2014. *Contact Dermatitis*. 2016;75:213-222.
10. R Core Team. R: A Language and Environment for Statistical Computing. Vienna, Austria; 2017. <https://www.R-project.org/>. Accessed May 22, 2018.
11. Meding B, Grönhagen CM, Bergström A, Kull I, Wrangsjö K, Lidén C. Water exposure on the hands in adolescents: a report from the BAMSE Cohort. *Acta Derm Venereol*. 2017;97:188-192.
12. Weistenhöfer W, Wacker M, Bernet F, Uter W, Drexler H. Occlusive gloves and skin conditions: is there a problem? Results of a cross-sectional study in a semiconductor company. *Br J Dermatol*. 2015;172:1058-1065.
13. Fartasch M, Taeger D, Broding HC, et al. Evidence of increased skin irritation after wet work: impact of water exposure and occlusion. *Contact Dermatitis*. 2012;67:217-228.
14. Bennike NH, Johansen JD, Menné T. Friction from paper and cardboard causing occupational dermatitis in non-atopic individuals. *Contact Dermatitis*. 2016;74:307-308.

15. Uter W, Gefeller O, Schwanitz HJ. An epidemiological study of the influence of season (cold and dry air) on the occurrence of irritant skin changes of the hands. *Br J Dermatol*. 1998;138:266-272.
16. Rycroft RJ. Low humidity and microtrauma. *Am J Ind Med*. 1985;8:371-373.
17. Mahler V, Aalto-Korte K, Alfonso JH, et al. Occupational skin diseases: actual state analysis of patient management pathways in 28 European countries. *J Eur Acad Dermatol Venereol*. 2017;31(Suppl 4):12-30.
18. Gelot P, Avenel-Audran M, Balica S, et al. Éducation thérapeutique du patient dans l'eczéma chronique des mains. *Ann Dermatol Venereol*. 2014;141(Suppl 1):S127-S142.
19. Anonymous. TRGS 401 Gefährdung durch Hautkontakt—Ermittlung, Beurteilung, Maßnahmen. *Gemeinsames Ministerialblatt*. 2008;40-41:818.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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