

Acceptance of skin products in healthcare workers: an empirical investigation

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Background	Healthcare workers (HCWs) are at high risk of developing hand eczema (HE). This can be exacerbated by hygiene measures related to the coronavirus disease (COVID-19). Using mild skin cleansers and emollients or moisturizers is central in the prevention of HE—especially with increased COVID-19 hygiene regimes.
Aims	This study aimed to assess parameters important for the acceptance of a skincare concept in HCWs.
Methods	In this proof-of-concept user trial, HCWs were provided <i>ad libitum</i> with hand wash oil and hand cream during the 6-month period, when occupationally acquired COVID-19 infections among HCWs were peaking in Germany and then surveyed about acceptance of the products using questionnaires.
Results	Of 135 HCWs, 115 (85%) responded. Skin tolerance of the hand wash oil and the hand cream was rated <i>very good</i> by 63% and 52% of the 115 participants, respectively. Of the 115 participants, 58% and 57% were <i>very satisfied</i> with the hand wash oil and the hand cream, respectively.
Conclusions	Acceptance of skin cleansing and skincare products in HCWs seems influenced by parameters such as self-assessed skin tolerance and self-reported overall satisfaction. It must be assumed that products are only used as recommended if they are well-accepted. Employers might survey employees about acceptance of products using the parameters identified to adjust concepts if necessary to sustainably contribute to the prevention of HE.
Key words	COVID-19; dermatitis; eczema; healthcare; occupational health.

Introduction

Healthcare workers (HCWs) are at high risk of developing work-related irritant contact dermatitis of the hands (hand eczema, HE), which has been exacerbated by increased coronavirus disease (COVID-19)-related hygiene measures [1,2]. Skin-damaging contact with water and detergents [3] may lead to an impairment of the epidermal barrier function and subsequently to xerosis cutis as well as an acute irritant and/or allergic HE. Chronic HE can subsequently manifest, involving individual suffering [4,5] and high medical costs [6].

Using mild skin cleansing products and emollients is recommended for the prevention of xerosis cutis and HE [7]. If skin cleansing and care products are not accepted, they will likely not be used [8]. The present study aimed

to identify parameters important to the acceptance of skin products in HCWs at a time when reported cases of occupationally acquired COVID-19 infections amongst HCWs peaked in Germany (>100 000 cases).

Methods

Ethical approval was obtained by the subcommission on the evaluation of medical research involving human subjects at the Medical Chamber of Lower Saxony, Hannover, Germany, under procedure number 30/34/2020. Informed consent was obtained. The trial was prospectively registered at the German Clinical Trials Register (DRKS), number DRKS00022957.

This proof-of-concept user trial was conducted in a hospital in Osnabrück, Germany, with an observation period

Key learning points

What is already known about this subject:

- Healthcare workers are at high risk of developing hand eczema.
- Using mild skin cleansers and emollients or moisturizers is central in the prevention of hand eczema.

What this study adds:

- Acceptance of mild skin cleansers and emollients or moisturizers aids use.
- It must be assumed that only well-accepted skin products are used as recommended.
- Self-assessed skin tolerance and self-reported overall satisfaction seem to be highly influential on overall acceptance of skin products.

What impact this may have on practice or policy:

- Occupational safety specialists and executives in hospitals might survey their employees about the acceptance of the provided hand cleansing and hand care products to uncover possible weaknesses of existing hand care concepts and adjust if necessary to contribute to the prevention of occupational hand eczema.
- The questionnaire provided within the current paper can be used as supplied or can easily be adapted to specific circumstances.

of 6 months, starting in December 2020. One hundred and thirty-five HCWs (10 wards) were invited and participated in the sense of *ad hoc recruitment*. Participants needed to provide written consent, be of legal age and be an active HCW. If known allergies to fragrances and/or oat flour were present, HCWs could not participate due to the ingredients of the study products. None of the invited HCWs suffered from these allergies. Exclusion criteria were the observation of adverse skin reactions attributed to the study products or termination of the employment as HCWs.

In the sense of a proof of concept, overall user acceptance of the skincare concept (hand wash oil and hand cream) was assessed (Table 1). Participants received a starter pack including four hand wash oils and four hand creams (Table 2) which could be subsequently requested in unlimited amounts. Participants were, via informational leaflet providing general information on skincare,

encouraged to use the study products at work and at home. Using other products (e.g. products provided at work) was not prohibited. Designing the standardized paper-and-pencil questionnaire followed the established steps of (i) constructing a basic structure, (ii) designing specific questions, (iii) selection and revision of the questions, (iv) compilation of the questionnaire and design of a codebook, (v) conducting a pre-test (20 HCWs) and (vi) optimizing the questionnaire and codebook [9,10]. Data were analysed in terms of descriptive statistics.

Results

The response rate was 85% (115 of 135; 85% female, age range from 18 to 63 years, mean age of 37.3 ± 13.5 years). Wards ($n = 10$) comprised the oncology unit, oral and maxillofacial surgery, pain unit, general surgery unit,

Table 1. Central characteristic features of the user acceptance assessment

Feature type	Feature of the study	Comment
Target setting	Ex-post test	Ex-post tests are used to assess the usability of products that are already on the market.
Scope/purpose	Full test	Within a full test, an integrated approach is undertaken in terms of reviewing the product.
Product presentation	Identifying test	Identifying tests are characterized through the fact that the product test is conducted with the study products being provided in the merchantable packaging. The brand and manufacturers' names are displayed.
Duration	Long-term test	A long-term test focuses on repeated consumption of the product. Product experience rather than product impression is assessed.
Number of test products	Monadic test	A monadic test is a single test that comprises a comparison with individual and personal knowledge and experiences. No comparison with a direct reference product is conducted.
Location	Home-use test	A home-use test is characterized by the test location being the usual home or work environment (real-life environment) or rather not an artificial setting (central-location test).

Table 2. Ingredients of the provided hand wash oil and hand cream, which are approved cosmetic products according to the German Cosmetics Ordinance (KVO), according to the International Nomenclature of Cosmetic Ingredients (INCI)

Hand wash oil		Hand cream	
Ingredient (INCI) ^a	Function ^b	Ingredient (INCI) ^a	Function ^b
Glycine Soja Oil	Emollient	Aqua	Solvent
Laureth-4	Surfactant	Glycerine	Humectant
MIPA-Laureth Sulfate	Cleansing	Paraffinum Liquidum	Emollient
Ricinus Communis Seed Oil	Skin conditioning	Cetyl Alcohol	Emulsion stabilizing
Ploxamer 101	Surfactant	Glyceryl Stearate	Emulsifying
Parfum	Perfuming	Stearyl Alcohol	Emollient
Aqua	Solvent	Hydrogenated Coco-Glycerides	Skin conditioning
Propylene Glycol	Viscosity controlling	Caprylic/Capric Triglyceride	Skin conditioning
Panthenol	Skin conditioning	Octyldodecanol	Emollient
Tocopherol	Antioxidant	Butyrospermum Parkii Butter	Skin conditioning
Citric Acid	Buffering	Cetyl Palmitate	Emollient
Sodium Citrate	Buffering	Colloidal Oatmeal	Skin protecting
		PEG-40 Stearate	Emulsifying
		Glycyrrhiza Inflata Root Extract	Skin conditioning
		Ceramide NP	Skin conditioning
		Menthoxypropanediol	Refreshing
		Citric Acid	Buffering
		Sodium Citrate	Buffering
		Decylene Glycol	Skin conditioning
		Phenoxyethanol	Preservative
		Caprylyl Glycol	Emollient
		Benzyl Alcohol	Preservative

According to the World Health Organization guidelines on infection prevention and control during healthcare when COVID-19 is suspected or confirmed, the hand wash oil can be classified as liquid soap.

^aAs per chronology of the listing on the package.

^bAccording to the manufacturer (Beiersdorf AG, Hamburg, Germany).

gastroenterology unit, orthopaedics unit, hand and trauma surgery, central sterilization supply department, surgery area and outpatient surgery. Registered nurses ($n = 61$), nursing assistants ($n = 17$), physician assistants ($n = 4$), surgical assistants ($n = 19$), technical sterilization assistants ($n = 13$) and technical anaesthesia assistants ($n = 1$) were represented.

The skin tolerance of the hand wash oil was rated as *very good* by 63%, as *good* by 22% and as *satisfactory* by 16% of the 115 participants. Regarding the hand cream, 52% rated the skin tolerance as *very good*, 30% as *good* and 18% as *satisfactory*. The options *sufficient* and *deficient* were not chosen.

Regarding the hand wash oil, out of the 115 study participants, 58% were *very satisfied*, 28% were *satisfied* and 14% were *neutral*. The option *not satisfied* was not chosen. Concerning the hand cream, out of the 115 participants, 57 were *very satisfied*, 27% were *satisfied*, 13% were *neutral* and 3% were *not satisfied*. Generally, no adverse skin reactions were observed.

Participants ($n = 115$) felt that the hand care concept (hand wash oil and hand cream in combination) *improves the signs of dry skin* (97%), *feels good on the skin* (93%), *has a pleasant scent* (89%), *helps the skin noticeably* (96%),

eases itch noticeably (96%), *makes the skin smooth* (91%) and *is easy to use* (100%).

Discussion

There is a high overall acceptance of the hand wash oil, the hand cream and the whole hand care concept by the HCWs. Repeated consumption in the real-life environment made it possible to evaluate product experience. A strength of this study is that a variety of individual professions were included, reflecting a broad spectrum of HCWs. Questionnaires administered via the so-called paper-pencil method made them easily accessible for all participants. A limiting factor is that questionnaires produce self-reported data, which are subjective and might entail bias.

Acceptance of skin cleansing and skincare products in HCWs might substantially be influenced by parameters such as self-assessed skin tolerance and self-reported overall satisfaction. Using adequate hand cleansing and hand care products, which must be accepted by the users so that they are used, might benefit the skin health of HCWs in terms of prevention, leading to a better quality of life for the individual as well as minimized costs for

employers and the social insurance system following an occupational dermatosis. Promotion of adequate use of skin products might prospectively be integrated into established health education initiatives (e.g. skin protection seminars in outpatient care).

Occupational health professionals should survey employees about the acceptance of hand cleansing and hand care products to reveal possible weaknesses of existing hand care and adjust if necessary to contribute to the prevention of occupational HE. The questionnaire provided within our paper can be used or can be adapted to specific circumstances.

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Competing interests

None declared.

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

References

1. Lan J, Song Z, Miao X *et al.* Skin damage among health care workers managing coronavirus disease-2019. *J Am Acad Dermatol* 2020;**82**:1215–1216.
2. Lin P, Zhu S, Huang Y *et al.* Adverse skin reactions among healthcare workers during the coronavirus disease 2019 outbreak: a survey in Wuhan and its surrounding regions. *Br J Dermatol* 2020;**183**:190–192.
3. Symanzik C, Kezic S, Jakasa I *et al.* Effects of skin washing frequency on the epidermal barrier function and inflammatory processes of the epidermis: an experimental study. *Contact Dermatitis* 2022. doi:10.1111/cod.14119.
4. Passlov HM, Pontén A, Björk J *et al.* Hand strength and dexterity in individuals with hand eczema. *J Eur Acad Dermatol Venerol* 2020;**34**:2856–2862.
5. Skoet R, Zachariae R, Agner T. Contact dermatitis and quality of life: a structured review of the literature. *Br J Dermatol* 2003;**149**:452–456.
6. Cortesi PA, Scalone L, Belisari A *et al.* Cost and quality of life in patients with severe chronic hand eczema refractory to standard therapy with topical potent corticosteroids. *Contact Dermatitis* 2014;**70**:158–168.
7. Elsner P, Agner T. Hand eczema: treatment. *J Eur Acad Dermatol Venerol* 2020;**34**:13–21.
8. Augustin M, Wilsmann-Theis D, Körber A *et al.* Diagnosis and treatment of xerosis cutis—a position paper. *J Dtsch Dermatol* 2019;**17**:3–33.
9. Taylor H. Skin health and surveillance. In: Rustemeyer T, Elsner P, John S-M, Maibach HI, eds. *Kanerva's Occupational Dermatology*. Berlin, Heidelberg: Springer Berlin Heidelberg, 2012; 1905–1915.
10. Susitaival P. Questionnaire methods in occupational skin disease epidemiology. In: Rustemeyer T, Elsner P, John S-M, Maibach HI, eds. *Kanerva's Occupational Dermatology*. Berlin, Heidelberg: Springer Berlin Heidelberg, 2012; 915–917.