Acceptance of skin products in healthcare workers: an empirical investigation

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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...
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,
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

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**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)

| Ingredients of Hand Wash Oil | Function | Ingredients of Hand Cream | Function |
|-----------------------------|----------|---------------------------|----------|
| 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 |
| Poloxamer 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| Butyropermum 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| Sodium Citrate           | Buffering |
| Decylene Glycol             | Skin conditioning | Phenoxethanol            | Preservative |
| Capryl 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.

*As per chronology of the listing on the package.
*According to the manufacturer (Beiersdorf AG, Hamburg, Germany).
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.

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