SHORT COMMUNICATION

Psychological Cofactors in Occupational Skin Diseases: Results of a Systematic Literature Search

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Skin diseases have been reported in association with psychological factors for a long time (1), resulting in the subsequent exacerbation of skin diseases, their persistence, or most commonly the psychological burden of these conditions. Most evidence has been identified for atopic dermatitis (AD) and psoriasis (Pso) regarding a significant psychosocial burden on one hand and an influence of stressful events on disease exacerbation on the other hand (2–5). Both AD and Pso can affect the hands and feet of patients. The diseases play an important role as differential diagnoses of occupational skin diseases (OSD) or may even be occupationally worsened through exposure to, e.g., irritative substances (6, 7). There is, however, little distinct information on OSD, especially on occupational hand eczema. OSD may be of significant severity and disease duration. Chronic hand eczema (CHE), the most common OSD, can place a substantial burden on patients (8). Factors like psychological distress, compliance, or even a patient's socioeconomic status and psychological comorbidities can have important implications in OSD (9). In patients attending a tertiary referral centre with suspected OSD, there have been an increasing number of cofactors and disease burden. In particular, psychological cofactors such as depression, anxiety disorder, reduced self-esteem, stress, and stigmatization have been increasingly observed in our occupational dermatology clinic. Therefore the current state of research in OSD in relation to psychological factors and disorders was investigated.

METHODS

We conducted a systematic literature search. The databases PubPsych, PubMed, Semantic Scholar, Wiley Online Library, ScienceDirect, and Google Scholar were searched. The search terms *psyche/psychological* were paired with *occupational skin disease, occupational dermatoses, occupational hand eczema, chronic hand eczema, contact allergy, contact dermatitis,* and *contact eczema*. Publications not written in German or English were excluded, as were animal studies. PubPsych, PubMed, and Semantic Scholar were searched systematically. Due to the high amount of irrelevant hits (3,000–16,000), the databases Wiley Online Library, ScienceDirect, and Google Scholar were searched until titles became irrelevant to the search terms. Searches were stopped after 250, 250, and 300 publications respectively. Abstracts were screened for relevance regarding both occupational dermatology (especially hand eczema) and psychological factors. Abstracts reporting on only a single topic were excluded. Abstracts focusing solely on patient quality of life (QOL) were excluded as well, as QOL does not accurately represent the psychological impact of OSD. In full-text screening, the procedure was identical. The whole search process is presented in **Fig. 1**.

RESULTS

We identified 53 publications in our systematic literature search (Fig. S1). There were 36 studies, 13 reviews, and 4 case reports. Causal inferences of psychological factors and OSD were not determined in any of the identified studies. Six studies suggested a possible influence of psychological factors such as psychological distress on the aetiology of OSD, 5 of which were cross-sectional. One study investigated psychosocial factors in association with skin problems in a retrospective and prospective design (10). Three more studies investigated an influence on the disease and treatment course. Depression was the most investigated psychological variable, followed by stress and anxiety (**Fig. 2**). Sixteen studies investigated the burden of OSD. In 9 studies, depression was described as a consequence of OSD. Anxiety and stress were mentioned in 6 and 4 studies respectively. Thirty-four were observational and 2 were interventional regarding

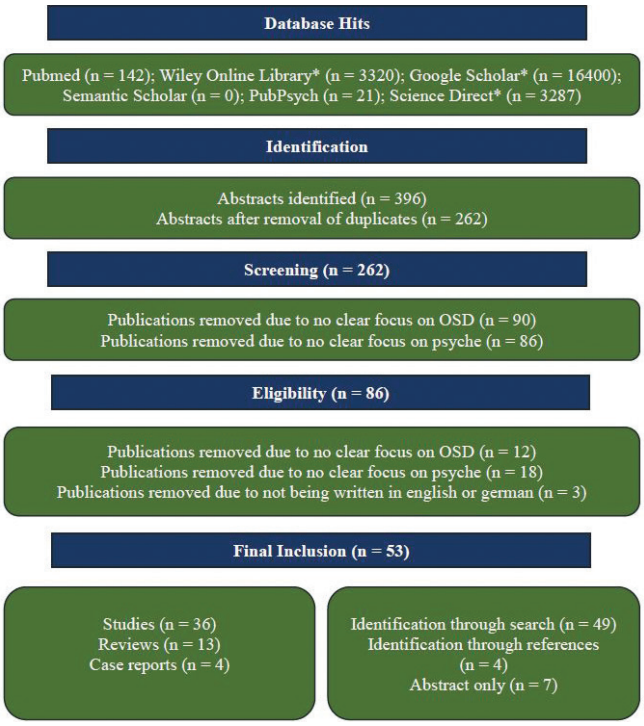

Fig. 1. Systematic literature search process.
*Search process stopped prematurely.

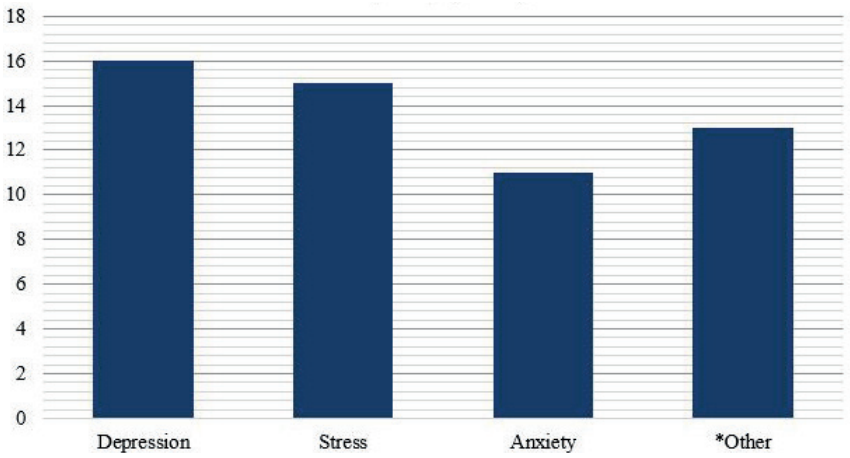

Fig. 2. Psychological cofactors and comorbidities sorted by frequency (*n*=36). *Burnout, obsessive-compulsive-disorder, mood, self-acceptance, coping, stigmatization, psychiatric comorbidities, mental health, personality factors, suicidal ideation, emotional consequences.

the outcome of a tertiary prevention measure on psychological factors such as mental health. Seven studies were case-control studies and detected differences between OSD patients and healthy controls. Four studies were selected to provide a broad spectrum of the current state of research (**Table I**).

CONCLUSION

None of the identified studies causally investigated OSD regarding a possible influence of psychological factors on the disease in a prospective manner. Cross-sectional, non-interventional studies cannot reliably explain whether the psyche and OSD influence each other or the direction of the association. Due to the increased need for psychodermatology services in patients suffering from OSD more research needs to be conducted regarding causality of psychological cofactors in OSD, especially CHE.

Conflict of interest statement: MW treats HE patients sent by the German (Governmental) Statutory Accident Insurance. EW has participated in clinical trials on itch and prurigo for Menlo, Kiniksa, TREVI, Incyte, Celldex and Galderma and has been a consultant (advisory board) for Galderma, Sanofi, and LEO Pharmaceuticals. She is an active member of the European and German guideline group on CHE and co-author of the European and German guidelines on hand eczema. EW treats HE patients sent by the German (Governmental) Statutory Accident Insurance. She initiated and leads a cohort study on optimized diagnostics of eczema-psoriasis of the hands that is supported by the German (Governmental) Statutory Accident Insurance, and serves as a Vice-President and board member of the German Society for Occupational Dermatology (ABD). EW is also Treasurer of the European Society of Contact Dermatitis.

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Table I. Selected studies from the systematic literature search

Title	Synopsis
Psychosocial work exposures as risk factors for skin problems in a general working population: cross sectional and prospective associations (10)	• General working population samples from 2016 (*n*=7,833) and 2019 (*n*=8,038) were investigated retro- and prospectively (*n*=3,430) • In the 2019 sample there was a significant association of low social support and skin problems (eczema, itchy skin, or rash). Emotional demands, role conflicts, and interpersonal conflicts were associated with skin problems in both samples • Emotional demands, role conflicts, and interpersonal conflicts were predictive of skin problems
Psychological factors associated with hand dermatoses: which subgroup needs additional care? (11)	• A significant association of high-stress reactivity with disease severity, more pruritus, depression, and critical life events was reported • 47.52% of hand dermatosis patients believed that stress influenced their disease course
Are skin disorders related to work strain in hospital workers? A cross-sectional study (12)	• The occurrence of hand dermatitis was reported more commonly in hospital workers with high job demands, low social support, high strain, and high iso-strain, as well as depression and anxiety
Emotional Burden of Patients With Work Related Hand Eczema: Results of an Exploratory Study in a Tertiary Individual Prevention Setting in Germany (13)	• The emotional burden of patients attending a tertiary prevention measure manifested as worries over life, sadness, lack of control, feelings of constraint, and being disturbed by pruritus • Optimism, balance, and self-confidence were positive emotions acting as protective factors

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