

Patterns of Addiction in Chronic Skin Diseases: A Comparative Analysis of Addictions and Influencing Factors in Atopic Dermatitis and Psoriasis

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Addictions seem to be more frequent in atopic dermatitis and psoriasis patients than in the general population. This cross-sectional observational study comparatively evaluated substance-related and behavioural addictions in atopic dermatitis and psoriasis patients and analysed possible addiction patterns. From October 2023 to April 2024, 100 atopic dermatitis and 104 psoriasis patients at a German university hospital completed an anonymous questionnaire, including sociodemographic and health-related parameters, along with validated assessment tools for common addictions (smoking, gambling, alcohol, drugs, food, and internet). More psoriasis patients had at least 1 addiction (50.0% vs 39.0%), were more frequent daily smokers (34.6% vs 15.0%) and reported gambling more frequently than atopic dermatitis patients. No differences emerged regarding gambling addiction. Psoriasis patients showed higher body mass index, with 1.9% addicted to food. Atopic dermatitis patients were more vulnerable to pathological internet use (9.0% vs 2.9%). Low happiness was a risk factor for smoking in atopic dermatitis and for gambling and drug consumption in psoriasis patients. Low disease severity was associated with pathological alcohol intake in psoriasis. Younger age emerged as a ubiquitous risk factor for drug consumption. Distinct addiction patterns in atopic dermatitis and psoriasis patients, influenced by age, happiness, and disease severity, should guide the development of education and screening strategies.

Key words: psoriasis; atopic dermatitis; behaviour, addictive; substance-related disorders; comorbidity; risk factors.

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Skin diseases are the 4th leading cause of nonfatal disease burden worldwide, affecting both low- and high-income countries, with eczema (including atopic dermatitis [AD]) and psoriasis (PSO) contributing significantly to the global burden of disease due to skin conditions (1).

Both conditions originate in chronic cutaneous inflammation with a “spillover effect” on various organ sys-

SIGNIFICANCE

Several studies using different validated scales for addictions in atopic dermatitis and psoriasis were sourced in the literature. Nevertheless, studies comparing the prevalence of addictions and potential influencing factors are still scarce. We aimed to assess various addictions in both atopic dermatitis and psoriasis populations and investigate health-related and sociodemographic parameters impacting pathologic substance use and behaviours. Specific addiction patterns for atopic dermatitis and psoriasis, as well as factors influencing addictions such as age, disease severity, and happiness, should be considered in a people-centred therapy approach, targeting addictions and implementing educational and screening methods.

tems, explaining the “inflammatory march” as a promoter for systemic comorbidities (2). Metabolic syndrome is more prevalent in PSO patients than AD patients (3) and seems to undergo a dose–response association with disease severity (4). AD exhibits a more heterogeneous range of comorbid disorders beyond atopy, including elevated prevalences of malignant and cardiovascular conditions (5), inflammatory bowel disease (6), and autoimmune disorders (7).

Regarding psychiatric comorbidities, frequent pathologic behaviour and substance use were reported in AD and PSO patients compared with the general population (8, 9). AD patients reported higher addiction rates in gambling, internet use, and drug and alcohol consumption. Moreover, male AD patients had the highest risk for alcohol addiction, while male gender and young age were risk factors for gambling and internet addiction (8). Regarding food addiction, 1 study in the United States revealed that almost 12.0% of AD patients were addicted (10).

In PSO patients, internet addiction ranged up to 8.5% (11), higher than the general population (12). Moreover, PSO patients were twice as addicted to smoking as the general population and displayed increased abuse rates for gambling, drugs, and alcohol (9, 13). Food addiction rates seemed inconclusive despite the higher BMI in PSO patients compared with the general population (9, 13).

Previous research highlighted the plausible effect of glycaemic variability linked to obesity and insulin resistance on craving and addiction disorders (14), tracing

possible addiction patterns among PSO patients. Conversely, internet and technology addictions were related to certain personality traits such as neuroticism (15), as well as ADHD symptoms (16), a reported comorbidity in AD patients (17). Furthermore, various types of addiction often cluster together, with drug use and pathological gambling posing the highest risk for cross-addictive behaviours (18).

The present study aims to provide a comparative analysis of addictions in AD and PSO, as well as sociodemographic and health-related risk factors. Such a comparison could ease physicians' screening routine by targeting specific at-risk groups within the AD and PSO populations.

MATERIALS AND METHODS

The prospective, survey-based cross-sectional study was conducted at the Department of Dermatology and Allergy, Technical University of Munich, from October 2023 to April 2024.

In- and outpatients (≥ 18 years of age) diagnosed with AD or PSO with adequate knowledge of the German language were eligible, while patients with multiple dermatologic conditions or who were legally incapacitated were excluded. All patients provided written informed consent prior to participation. Institutional ethics approval was obtained from the Ethics Committee of the Medical Faculty of the Technical University of Munich (2023-308-S-KH). Patients received no incentives for participation.

Questionnaire

The anonymous paper-based questionnaire asked for sociodemographic characteristics, including age, gender, place of living, employment, marital status, weight, and height (**Table I**). Health-related parameters were assessed using disease duration (year of diagnosis), self-assessed disease severity (numeric Rating Scale from 1–10), and the Dermatology Life Quality Index (DLQI). The DLQI includes 10 questions assessing the impact of dermatologic conditions on daily life, such as symptoms and feelings, personal relationships, and treatment. The total score ranges from 0 (no impairment in quality of life) to 30 (massive impairment in quality of life) (19).

Happiness was assessed through the single-item question, "Taking all things together, how happy would you say you are?" with answer options from 0 (extremely unhappy) to 10 (extremely happy) (20).

Table I. Sociodemographic characteristics of the study populations of atopic dermatitis (AD) and psoriasis (PSO) patients

Factor	AD (<i>n</i> = 100)	PSO (<i>n</i> = 104)	<i>p</i> -value ^{a,b}
Age, years, mean $\pm$ SD	39.5 $\pm$ 18.4	47.4 $\pm$ 13.8	< 0.001
Gender, <i>n</i> (%)			
Female	47 (47.0)	40 (38.5)	0.218
Male	53 (53.0)	64 (61.5)	
Place of living, <i>n</i> (%)			
Urban	76 (76.0)	76 (73.1)	0.632
Rural	24 (24.0)	28 (26.9)	
Employment, <i>n</i> (%)			
Employed	70 (70.0)	81 (77.9)	0.199
Unemployed	30 (30.0)	23 (22.1)	
Marital status, <i>n</i> (%)			
Single/divorced/separated/widowed	49 (49.0)	49 (47.1)	0.788
In a relationship/married	51 (51.0)	55 (52.9)	

^aAD vs PSO. ^b χ^2 test for nominal variables/Mann–Whitney *U* test for scale variables. SD: standard deviation.

Smoking behaviour was assessed by "How many/ how often do you smoke cigarettes?" (none) to "more than 2 packs/day). Patients answering other than "none" were asked to provide the smoking duration (in years). Daily smokers were considered positive for smoking addiction.

Gambling addiction was assessed by the 2-item Lie/Bet questionnaire, registering the urge to lie about gambling behaviour and the drive to spend increased sums of money for gambling (21).

Problematic alcohol consumption was assessed with the 10-item Alcohol Use Disorders Identification Test (AUDIT), covering quantity, drinking behaviour, side effects, and alcohol-related problems (22). Scores range from 0 to 40, classifying behaviour as hazardous (8–12 points for women, 8–14 for men) and dependent (>13 points for women, > 15 points for men). Positive addiction was registered from a cut-off score of 8 points.

Drug consumption was registered with the 11-item Drug Use Disorders Identification Test (DUDIT), with a total score between 0 and 44 points and a cut-off score of 25 points indicating addiction (23). The scoring tool enables differentiation among non-consumers, individuals with problematic drug consumption, and drug dependence. The cut-off scores for addiction in the logistical regression were 6 for men and 2 for women (drug-related problems).

Regarding food addiction, the 13-item scale Modified Yale Food Addiction Scale Version 2.0 (mYFAS 2.0) was applied (24), which includes 11 symptom-related questions and 2 items on impairment/distress. Addiction requires a minimum of 2 symptoms and the criteria for impairment or distress and is classified as mild (2–3 symptoms and impairment or distress), moderate (4–5 symptoms and impairment or distress), or severe (6 or more symptoms and impairment or distress). In the logistic regression, addiction was assumed when mild, moderate, or severe symptoms occurred.

Internet addiction was assessed with the Internet Addiction Test (IAT), a 20-item questionnaire with a possible total score of 100 (25). The results classify mild level (31–49 points), moderate level (50–79 points), and severe dependence upon the internet (80–100 points). Moderate and severe cases (cut-off ≥ 50 points) were considered addicted in the logistical regression. Considering the increased internet usage, higher cut-off scores compared with those proposed by Young 2 decades ago seem more reliable (26).

A detailed description of each instrument can be found in Table SI.

Statistical analysis

Missing data accounted for 2.0% of the overall dataset, and single imputation was employed as an appropriate method to handle the incomplete records.

Data normality was assessed using the Shapiro–Wilk and Kolmogorov–Smirnov tests. Descriptive data were presented as mean, standard deviation (SD), absolute (*n*), and relative frequencies (%). Differences in sociodemographics, health-related parameters, and addictive behaviours between AD and PSO groups were analysed using the Mann–Whitney *U* test, χ^2 test, and Fisher's exact test.

To investigate addiction risk factors, logistic regressions were conducted. Hierarchical logistic regression was constructed in 4 steps (models 1 to 4). Model 1 introduced disease duration and DLQI, model 2 added happiness, model 3 disease severity, and model 4 age. The second logistic regression (model 5) simultaneously introduced gender, place of living, employment, and marital status as control variables. All models were analysed distinctly for AD and PSO. Due to limited cases (*n*=2) no regression analysis was performed for food addiction. Standardized coefficients (B), Nagelkerke R-square and χ^2 were reported for each model.

Data were analysed using IBM SPSS Statistics (Statistical Package for the Social Sciences, Version 29, IBM Corp, Armonk,

NY, USA), and the charts and graphics were illustrated with the Microsoft Office Package (Version 16) (Microsoft Corp, Redmond, WA, USA). *P*-values <0.05 were considered statistically significant.

RESULTS

Patients' characteristics

A total of 204 patients (100 AD, 104 PSO) were included. Mean age was higher in the PSO than in AD patients (mean age: 47.4 ± 13.8 vs 39.5 ± 18.4 years, $p < 0.001$, Table I). PSO patients were more frequently male (61.5% vs 53.0%; $p = 0.218$) and living in rural areas than AD individuals (26.9% vs 24.0%; $p = 0.632$). A higher proportion of AD patients were unemployed (30.0% vs 22.1%; $p = 0.199$) and no substantial differences were noted in marital status ($p = 0.788$).

AD patients showed a DLQI score of 11.6 ± 7.6 , more than double that of the PSO patients (5.5 ± 6.7 , $p < 0.001$, Table II). Disease severity was similar for both diagnoses (6.0 ± 2.0 vs 6.0 ± 3.0) and disease duration was slightly higher for AD patients (22.4 ± 14.0 vs 20.3 ± 13.2 years; $p = 0.234$). PSO patients reported higher happiness scores (6.7 ± 2.4 vs 6.3 ± 2.5 ; $p = 0.300$) and a higher BMI (29.2 ± 7.7 vs 25.8 ± 6.2 ; $p < 0.001$) than the AD patients.

Addictive behaviour

At least 1 addiction was found in 50.0% of PSO and 39.0% of AD patients (Table III). PSO patients were more frequent daily smokers than those with AD, with 24.0% of PSO patients smoking daily but less than 1 pack/day (vs 9.0%) and 10.6% of PSO patients smoking 1 pack or more daily (vs 6.0%, $p = 0.010$). Smoking duration was significantly higher in the PSO group (25.5 ± 12.0 vs 15.1 ± 12.9 , $p < 0.001$). Overall, 34.6% of PSO and 15.0% of AD patients were addicted to smoking ($p = 0.001$).

Gambling screening revealed that 5.8% of PSO patients were addicted to gambling compared with 2.0% of AD patients ($p = 0.280$).

Alcohol consumption showed similarities between the 2 groups (PSO 12.5% vs AD: 13.0%, $p = 0.915$). Harmful or hazardous drinking had a prevalence of 8.0% in AD and 7.7% in PSO patients, while alcohol dependence

was registered in 5.0% of AD and 4.8% of PSO patients ($p = 0.994$).

A total of 12.0% of AD patients were screened positive for having a drug-related problem, with none of them showing drug addiction. PSO patients screened positive in 10.6% of cases, 9.6% of them showed a drug-related problem, and 1.0% tested positive for drug addiction ($p = 0.655$).

Addictive food intake was reported in 1.9% of PSO patients, while no AD patients screened positive ($p = 0.498$). Among the food-addicted individuals, 1.0% registered a moderate, respectively severe addiction.

Internet addiction was positive in 9.0% of AD and 2.9% of PSO patients ($p = 0.063$). Mild addiction was registered in 39.0% of AD and 24.0% of PSO patients, moderate in 9.0% of AD, and 2.9% of PSO, while the

Table III. Addiction diagnoses based on scores and screening results

Factor	AD (n = 100)	PSO (n = 104)	p-value ^{a,b,c}
≥ 1 positive addiction, n (%)	39 (39.0)	50 (50.0)	0.191
Smoking quantity, n (%)			
None	76 (76.0)	58 (55.8)	0.010
Rarely	9 (9.0)	10 (9.6)	
Daily, but less than 1 pack ^e /day	9 (9.0)	25 (24.0)	
Approx. 1 pack ^e /day or more	6 (6.0)	11 (10.6)	
Smoking duration, years, mean ± SD	15.1 ± 12.9	25.5 ± 12.0	< 0.001
Smoking screening, n (%)			
Negative	85 (5.0)	68 (65.4)	0.001
Positive	15 (15.0)	36 (34.6)	
Lie/Bet screening			
Negative	98 (98.0)	98 (94.2)	0.280
Positive	2 (2.0)	6 (5.8)	
AUDIT diagnosis, n (%)			
No problematic drinking	87 (87.0)	91 (87.5)	0.994
Harmful or hazardous drinking	8 (8.0)	8 (7.7)	
Alcohol dependence	5 (5.0)	5 (4.8)	
Alcohol screening, n (%)			
Negative	87 (87.0)	91 (87.5)	0.915
Positive	13 (13.0)	13 (12.5)	
DUDIT diagnosis, n (%)			
No drug-related problem	88 (88.0)	93 (89.4)	0.655
Drug-related problem	12 (12.0)	10 (9.6)	
Drug addiction	0 (0.0)	1 (1.0)	
Drugs screening, n (%)			
Negative	88 (88.0)	93 (89.4)	0.748
Positive	12 (12.0)	11 (10.6)	
mYFAS 2.0 diagnosis, n (%)			
No food addiction	100 (100.0)	102 (98.1)	— ^d
Mild food addiction	0 (0.0)	0 (0.0)	
Moderate food addiction	0 (0.0)	1 (1.0)	
Severe food addiction	0 (0.0)	1 (1.0)	
Food screening, n (%)			
Negative	100 (100.0)	102 (98.1)	0.498
Positive	0 (0.0)	2 (1.9)	
IAT diagnosis, n (%)			
No internet addiction	52 (52.0)	76 (73.1)	0.005
Mild internet addiction	39 (39.0)	25 (24.0)	
Moderate internet addiction	9 (9.0)	3 (2.9)	
Severe internet addiction	0 (0.0)	0 (0.0)	
Internet screening, n (%)			
Negative	91 (91.0)	101 (97.1)	0.063
Positive	9 (9.0)	3 (2.9)	

^aAtopic dermatitis (AD) vs psoriasis (PSO); ^bχ² test for nominal variables/Mann-Whitney U test for scale variables; ^cFisher's exact test for counts < 5; ^dno significance test due to zero counts; ^ea pack is considered to be 20 cigarettes.

AUDIT: Alcohol Use Disorders Identification Test; DUDIT: Drug Use Disorders Identification Test; mYFAS 2.0: Modified Yale Food Addiction Scale Version 2.0; IAT: Internet Addiction Test.

Table II. Health-related characteristics of the study populations

Factor	AD (n = 100)	PSO (n = 104)	p-value ^{a,b}
Disease severity, mean ± SD	6.0 ± 2.0	6.0 ± 3.0	0.548
DLQI, mean ± SD	11.6 ± 7.6	5.5 ± 6.7	< 0.001
Disease duration, years, mean ± SD	22.4 ± 14.0	20.3 ± 13.2	0.234
Happiness, mean ± SD	6.3 ± 2.5	6.7 ± 2.4	0.300
Body mass index, kg/m ² , mean ± SD	25.8 ± 6.2	29.2 ± 7.7	< 0.001

^aAtopic dermatitis (AD) vs psoriasis (PSO); ^bχ² test for nominal variables/Mann-Whitney U test for scale variables.

DLQI: Dermatology Life Quality Index; SD: standard deviation.

rest reported no internet addiction ($p=0.005$). No patient showed severe internet addiction.

Model 1 revealed no significant results. Model 2 of the logistic regression for each disease showed that smoking was negatively associated with happiness in AD patients ($B=-0.299$, $p=0.025$), while no risk factors were significant in smoking addiction in PSO patients (Table IV and Tables SII–SVI). Additional risk factors were rural living and unemployment, although not statistically significant. Being single and male had higher odds of smoking in PSO than AD patients.

Negative associations were revealed in model 2 between pathological gambling and happiness ($B=-0.497$, $p=0.018$) in PSO patients. Model 3 revealed that DLQI and severity were negatively associated with gambling in PSO patients, while AD patients had higher odds of gambling with increased severity. Model 5 showed that being male, unemployed, and living in an urban setting

were risk factors for both conditions, yet not statistically significant. Being in a relationship or married acted protectively for PSO, but not for AD patients.

In model 3, alcohol addiction was significantly negatively associated solely with disease severity in PSO patients ($B=-0.322$, $p=0.015$). Happiness and severity were negatively associated with alcohol addiction in AD patients. Male gender and unemployment increased odds in AD patients, yet decreased them in PSO patients, while being in a relationship or married reduced addiction odds in both groups.

In model 4, drug consumption was negatively associated with lower age in all patients (AD: $B=-0.170$, $p=0.019$; PSO: $B=-0.085$, $p=0.014$), and happiness had significantly lower odds for PSO patients ($B=-0.343$, $p=0.043$). Male gender and being single, divorced, separated, or widowed increased the odds of addiction in both groups, although not statistically significantly.

Table IV. Logistic regression models for atopic dermatitis ($n=100$) and psoriasis patients ($n=104$)

Positive screenings	Atopic dermatitis					Psoriasis				
	Smoking	Gambling	AUDIT	DUDIT	IAT	Smoking	Gambling	AUDIT	DUDIT	IAT
Standardized Coefficients (B)										
Model 1										
1. Disease duration	-0.010	0.015	0.010	0.011	0.019	-0.029	-0.031	-0.021	0.000	-0.034
2. DLQI	0.003	-0.039	-0.005	0.076	0.057	0.060	-0.086	0.011	0.013	-0.035
R-square ^a	0.004	0.014	0.005	0.070	0.045	0.100	0.043	0.017	0.002	0.022
χ^2 ^b	0.249	0.252	0.244	3.682	2.073	7.842	1.593	0.942	0.081	0.537
p -value ^c	0.883	0.882	0.885	0.159	0.355	0.020 ^d	0.451	0.624	0.960	0.765
Model 2										
1. Disease duration	-0.011	0.015	0.01	0.011	0.019	-0.030	-0.045	-0.022	-0.005	-0.041
2. DLQI	-0.052	-0.076	-0.035	0.068	0.053	0.052	-0.210	0.003	-0.025	-0.097
3. Happiness	-0.299 ^d	-0.233	-0.175	-0.045	-0.024	-0.058	-0.497 ^d	-0.058	-0.255	-0.326
R-square ^a	0.096	0.044	0.035	0.071	0.046	0.104	0.203	0.020	0.064	0.086
χ^2 ^b	5.355	0.540	1.661	0.106	0.022	0.331	6.236	0.175	3.220	1.552
p -value ^c	0.021 ^d	0.463	0.198	0.744	0.881	0.565	0.013 ^d	0.676	0.073	0.213
Model 3										
1. Disease duration	-0.011	0.013	0.006	0.010	0.020	-0.034	-0.045	-0.013	-0.001	-0.041
2. DLQI	-0.053	-0.113	-0.008	0.079	0.036	0.042	-0.217	0.046	-0.011	-0.099
3. Happiness	-0.300 ^d	-0.233	-0.185	-0.042	-0.029	-0.044	-0.595 ^d	-0.126	-0.286	-0.316
4. Severity	0.013	0.407	-0.255	-0.094	0.150	0.105	-0.214	-0.322 ^d	-0.138	0.043
R-square ^a	0.096	0.105	0.094	0.079	0.061	0.120	0.237	0.134	0.082	0.088
χ^2 ^b	0.009	1.093	3.293	0.389	0.701	1.296	1.345	6.514	0.989	0.027
p -value ^c	0.925	0.296	0.070	0.533	0.402	0.255	0.246	0.011 ^d	0.320	0.869
Model 4										
1. Disease duration	-0.008	0.209	0.013	0.111	0.124	-0.033	-0.041	-0.015	0.039	-0.045
2. DLQI	-0.054	-0.099	-0.011	0.104	0.044	0.042	-0.219	0.046	-0.012	-0.099
3. Happiness	-0.304 ^d	-0.202	-0.190	-0.121	-0.081	-0.044	-0.609 ^d	-0.124	-0.343 ^d	-0.312
4. Severity	0.003	0.314	-0.263	-0.168	0.114	0.104	-0.225	-0.321	-0.153	0.051
5. Age	-0.012	-0.204	-0.018	-0.170 ^d	-0.140	-0.003	-0.011	0.005	-0.085 ^d	0.011
R-square ^a	0.104	0.244	0.109	0.325	0.238	0.120	0.239	0.134	0.230	0.090
χ^2 ^b	0.526	2.566	0.872	14.355	8.616	0.030	0.102	0.046	8.159	0.059
p -value ^c	0.468	0.109	0.350	0.000 ^d	0.003 ^d	0.864	0.750	0.830	0.004 ^d	0.807
Model 5										
1. Gender (male)	0.171	18.304	1.064	0.439	0.896	0.413	19.095	-0.356	0.152	17.423
2. Place of living (rural)	0.175	-17.289	0.001	0.216	-0.853	0.188	-0.399	-1.614	-0.475	-18.206
3. Employment (unemployed)	0.552	2.055	0.886	0.841	1.239	0.037	0.669	-0.333	-0.155	-15.726
4. Marital status (in a relationship/married)	-0.060	0.983	0.448	-1.058	-0.975	-0.614	-1.919	0.320	-0.262	18.153
R-square ^a	0.017	0.264	0.060	0.102	0.151	0.035	0.288	0.073	0.015	0.397
χ^2 ^b	0.958	4.822	3.297	5.435	7.085	2.659	11.255	4.091	0.748	9.962
p -value ^c	0.916	0.306	0.509	0.246	0.131	0.616	0.024 ^d	0.394	0.945	0.041 ^d

Hierarchical introduction of parameters; Model 1: disease duration, DLQI score; Model 2: happiness score; Model 3: disease severity; Model 4: age; Model 5: gender (reference: female), place of living (reference: urban), employment (reference: employed), marital status (reference: single/divorced/separated/widowed).

^aNagelkerke R-square; ^b χ^2 for each model; ^c p -value for each model; ^dsignificant at 0.05 level.

AUDIT: Alcohol Use Disorders Identification Test; DLQI: Dermatology Life Quality Index; DUDIT: Drug Use Disorders Identification Test; IAT: Internet Addiction Test.

Rural living and unemployment had higher odds only for AD patients.

No significant risk factors for internet addiction were identified. Increased disease severity showed a positive association, while happiness was negative in both conditions. Disease duration and higher DLQI were risk factors in AD, yet not in PSO patients. Model 5 revealed higher odds for male gender and urban living in both groups, while unemployment and being single were risk factors only for AD patients. The complete logistic regression charts are detailed in Tables SII–SVI.

DISCUSSION

The study aimed to compare the prevalence of 6 common addictions in AD and PSO patients and identify associated sociodemographic and health-related factors. Our study indicated that PSO patients are more prone to addiction than individuals with AD, with half of PSO patients and 39.0% of AD patients positive for at least 1 addiction. PSO patients showed a higher daily smoking prevalence, while AD individuals were more frequently internet addicted. Higher happiness acted protective against smoking in AD patients, gambling and drug consumption in PSO patients. Higher disease severity decreased alcohol addiction in PSO patients, while younger age emerged as a ubiquitous risk factor for drug consumption.

These results are in line with previous studies reporting smoking behaviours in AD and PSO patients independently (13, 27). This higher smoking prevalence among PSO patients sustains the theory that smoking is associated with the PSO clinical severity (28). Conversely, the lower smoking rate among AD patients indicates the well-known exacerbating effect of smoking on atopic comorbidities, leading to voluntary refraining from smoking (29).

The high gambling rates in the PSO group confirmed earlier results of 19.0% (9), signalling the need for evidence-based guidelines for gambling screening and therapy as are currently available for alcohol, smoking, and drug addiction in Germany. Compared with the general German population (30), AD patients seemed to be less predisposed. Differences might arise from metabolic messengers involved in food intake and bodyweight, such as ghrelin or Glucagon-like peptide 1, which also influence impulsive behaviour and dopamine turnover (14, 31), as in pathological gambling. While 1 study revealed high ghrelin levels in PSO patients (32), further research on potential causality in this patient population might be indicated.

Both cohorts registered similar rates of alcohol addiction, exceeding almost 3 times the rates of 3.1% of the general German population (33). Given the proinflammatory effect of alcohol – impacting cytokines, lymphocyte activation, and keratinocyte proliferation

(34) – longitudinal studies are required to unravel the causality between alcohol consumption and chronic skin diseases.

The similarity between AD and PSO patients in drug consumption has previously been described, emphasizing the increased risk of drug addiction in patients with chronic skin conditions. However, the prevalence rate in our study was up to twice as high (8, 13, 27). The continuous interval scaling used by DUDIT reduces under-reporting (22), unlike the dichotomous scaling of the previously used screening test DAST-10 (Drug Abuse Screening Test).

Food addiction was merely registered in PSO patients, lying under the general population rates despite the higher BMI in our PSO sample (29.2 vs 7.9%) (35), underlining the higher prevalence of metabolic comorbidities such as adiposity among PSO patients (4). The results also differ from those of Zink et al. (9), who found higher food addiction rates in more severe PSO cases (mean DLQI 5.5 vs 8.11). The association between PSO and metabolic syndrome stems from the systemic Th1 and Th17 inflammation (36), necessitating screening for food and metabolic disorders in PSO patients.

The prevalence of internet addiction among AD patients endorses previously reported data (8, 27), while being significantly lower than previously reported for PSO (11). The latter resides in the recruitment setting used previously, with more potentially addicted patients to be found through online channels. The younger age distribution in our AD compared with the PSO patients might explain the higher prevalence in AD (37), yet further research is needed to control for additional factors such as personality traits, especially neuroticism (15), with potential influence on AD patients' internet use.

Lower happiness surfaced as an influencing parameter for smoking in AD patients and gambling in PSO patients. This correlation might originate in disbalances in the dopaminergic system, stimulating compulsive and risky behaviour (38). The impact of alcohol intake on disease severity is heterogeneous across the literature (39) and our findings surprisingly associated PSO patients' alcohol consumption with lower disease severity, contrasting further results linking alcohol intake with severe forms of PSO (39) and exacerbations (34). This contrast may lean toward diverse methodology, confounding variables, and geographical variances. Although the association between age and addiction is still controversial (8, 13, 37), younger age emerged as a ubiquitous risk factor for drug addiction.

Several associations between sociodemographic factors and addictions were previously found in the literature, yet we could not identify any clear associations in our study. Male gender corroborated as a risk factor for pathological gambling (40) and unemployment for smoking, gambling, alcohol, and drug addiction. Further

studies on predisposing factors in high-risk groups might offer additional evidence.

Despite the single-centre study design, the university hospital enabled recruitment of a broad spectrum of disease severities. Widely used, validated questionnaires were used for the addiction assessment, yet the prevalence rates derived from these tools do not equate to diagnoses.

Selection and self-selection biases should be considered, as voluntary participation likely attracted patients interested in the study topic. Furthermore, social-desirability bias might have led to under-reporting stigmatizing behaviours. Information bias, particularly regarding drug consumption, possibly occurred, because patients might not consider prescription drugs to be addictive. As only patients in dermatological care were included, the generalizability of the results is limited to this setting.

This study hints at elevated addiction rates in PSO patients compared with AD individuals. Regarding smoking and food addiction, PSO patients reported higher prevalences, while AD patients were more frequently internet addicted. Low happiness might indicate risk behaviour in patients with chronic skin disorders, and disease severity might predict pathological alcohol intake in PSO patients. Screening should prioritize young individuals for drug addiction and, even though not significant, male gender and unemployment render risk factors warranting focus. The study findings outline the necessity for standardized screening guidelines in the clinical routine, particularly for at-risk groups, and advocate for a collaborative approach between dermatologists and psychologists to enhance medical care for patients with chronic skin diseases. Further research should explore cause-and-effect relationships among chronic skin diseases and addiction, the potential influence of comorbidities as mediators, and the impact of addiction on patients' compliance and disease insight. Other research directions on the topic might involve analyzing sociocultural (i.e. cultural background, lifestyles, education level), as well as geographical factors that might play a role in the development of the different addictions.

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