

People-centered care for psoriasis and urticaria: Are we overlooking Internet addiction while only considering patients and physician settings?

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Abstract

Psoriasis and chronic urticaria (CU) are chronic skin diseases with a high impact on individuals' life and mental health. Some studies indicate a high prevalence of Internet addiction and many affected individuals seem not to utilize healthcare, but rather search for health-related information online. The aims of the study were to assess Internet addiction as a potential comorbidity in both diseases as well as identify differences in healthcare utilization between individuals with psoriasis and CU. This cross-sectional study is based on self-reported data from individuals with psoriasis and CU living throughout Germany using the framework of an online survey from 12/2018 to 01/2019. Advertisements on Google and Facebook were used to address Internet users who searched online for information on psoriasis or CU. The study questionnaire comprised questions on demographics, current contact with physicians, and disease history as well as validated screening tools for well-being and Internet addiction. Overall, 1686 participants (74.0% female, 38.5% psoriasis) with a mean age of 36.9 ± 12.9 years were analyzed. Participants with CU were more likely female (89.2% vs 49.8%, $P < 0.001$) and not in medical care compared to participants with psoriasis (60.3% vs 45.9%, $P < 0.001$). Sixteen percent of the participants overall were screened positive for Internet addiction. Furthermore, not utilizing medical care showed a significant association with being screened positive for Internet addiction in participants with CU (adjusted odds ratio [aOR] = 1.49, 95% confidence interval [CI] 1.10–2.02), but not in those with psoriasis. The study revealed a high proportion of affected individuals not being in medical care and a high prevalence of Internet addiction, with individuals with CU not utilizing medical resources having a higher chance of being screened positive for Internet addiction. This underlines the approach of people-centered care and highlights its importance for further research.

KEYWORDS

chronic skin diseases, dermatology, Internet addiction, depression, mental health, epidemiology, people-centered care

Correction added on 6th February 2021, after first online publication: Maximilian Christian Schielein was designated as corresponding author

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1 | INTRODUCTION

In Europe, the prevalence of psoriasis ranges between 1.3% and 11.4%, with a reported prevalence of 2.0% in Germany.^{1,2} Chronic urticaria (CU) has a point prevalence of 0.5% to 1.0% across Europe.³ The psychosocial burden of both diseases is high as individuals often experience stigmatization or social and sexual avoidance^{4,5} as well as suffering from comorbidities including mental diseases.^{6,7} For example, studies demonstrated that psoriasis patients showed an addictive behavior regarding cigarettes and alcohol.^{8–10} First studies indicated that psoriasis is potentially associated with other addictive behaviors such as Internet addiction.^{11,12} As Internet addiction represents a rapidly rising phenomenon of societies worldwide, the fifth edition of *Diagnostic and Statistical Manual of Mental Disorders* mentioned it as the most potent problem needing further research. Therefore, it is essential to clarify its presence in people with chronic visible skin diseases, who often withdraw themselves from social activities.^{5,13,14} However, those studies used heterogeneous settings as one study included patients recruited by dermatologists and the other people recruited via psoriasis self-help groups, and showed a wide variation in the Internet addiction rate. The association between CU and Internet addiction has not been investigated so far.

Adequate treatment can not only improve patients' symptoms, but may also reduce mental health burden.^{15,16} However, there are barriers in the use of modern treatments and not every patient receives therapy according to the respective national guidelines.^{17,18} Furthermore, it is important to distinguish between patients and affected individuals as some persons do not contact a physician due to their skin disease.^{19,20} The World Health Organization (WHO) hence demands an improvement of people-centered care to bridge the gap between physicians and affected individuals.^{21,22} Accordingly, psoriasis should be considered as model disease and according to the WHO other chronic skin diseases were to be included if possible.²¹

When reaching out for individuals suffering from their disease, but who do not consult a doctor, prior research showed that usage of the Internet might be beneficial^{23,24} as it is a commonly used source for health information.²⁵ One study showed that 80% of affected people used the Internet to receive initial or additional information about their disease.²⁶ Additionally, online search analysis demonstrated that the burden of specific diseases is high and anonymous online settings might reduce social desirability bias.²⁷ Reaching out for affected individuals online showed good results in the field of dermatology.²⁸

The aims of this study were (i) to estimate the prevalence of Internet addiction in people suffering from psoriasis and CU reached online; and (ii) to identify differences in healthcare utilization between individuals with both diseases.

2 | METHODS

2.1 | Study design and participants

This noninterventional cross-sectional study assessed self-reported data from individuals with psoriasis and CU living throughout Germany using the framework of an online survey from December 2018 to January 2019. Recruitment was carried out through online banner advertisement on Facebook and Google. The banners stated, for example, "Psoriasis Survey – participate now!" or "Urticaria – looking for participants in a survey," and specifically addressed individuals whose prior search behavior indicated interest in these diseases and therefore represent a certain subpopulation of individuals with the respective disease. Before starting the survey, participants gave their electronic informed consent. Inclusion criteria were (i) 18 years and older; (ii) self-stated physician diagnosis of psoriasis or CU and associated symptoms within the last 3 months; and (iii) self-stated ability to complete the German questionnaire. All these criteria had to be answered before being able to start the questionnaire. If one question was neglected, participants were guided to the respective self-help web pages. To ensure data quality, participants answering less than 80% of the study questionnaire were excluded. Ethical clearance for all analyses was sought from the Ethics Commission of the Faculty of Medicine of the Technical University of Munich.

2.2 | Questionnaire

The study was designed by a consortium of two experienced dermatologists and two epidemiologists, and variables were only added or deleted after consensus. Questions asked for general demographics (age, gender, relationship status, current employment), current utilization of healthcare system, disease history (duration of disease, time span from first symptoms to first diagnoses), and mental health aspects, including a short version of the patient health questionnaire (PHQ-D)²⁹ as well as the short version of the Compulsive Internet Using Scale (CIUS).³⁰ The PHQ-D is a screening tool for depression and consists of two dichotomous questions ("During the past month, ...": (i) "Have you often been bothered by feeling down, depressed, or hopeless?" or (ii) "Have you often been bothered by little interest or pleasure in doing things?").²⁹ The score ranges from 0 to 2 and a score of ≥ 1 is considered as a positive screening for further investigation towards depression. The CIUS is a screening tool for Internet addiction and consists of five questions using a five-point Likert scale ranging from "never" (0) to "very often" (4). It represents a reliable questionnaire (Cronbach's alpha: 0.77) and the suggested cut-off value is ≥ 7 for a positive screening result, resulting in a sensitivity of 0.95 and a specificity of 0.87.^{30,31} To minimize false-positive results and to increase the reliability of prevalence estimations of Internet addiction, the cut-off value for the estimation of prevalence

was increased to ≥ 9 , whereby the specificity increases to 0.96.³⁰ Additionally, time spent online per day for leisure as well as days per week spent online (both not including activities for work) were queried and summarized as hours spent online per week for further analyses. Disease severity was measured by asking for participants' self-stated affected body surface area (BSA), which was to be estimated in hands (one hand = 1% of body surface).³² A value of ≥ 10 indicated a moderate to severe form of psoriasis. Disease control of CU was measured using the Urticaria Control Test (UCT), which consists of four questions being answered using a five-point Likert scale (range 0–16). It refers to participants' disease during the last 4 weeks and a cut-off of ≤ 11 indicates a poorly controlled CU.³³ To assure high quality of data and minimize bias due to missing data, several plausibility checks were implemented before the analysis (e.g. the time since diagnosis or onset of symptoms could not be higher than age).

2.3 | Statistics and data management

Descriptive data were generated. Data were stratified by disease as well as by utilization of medical care. Linear variables were compared using an unpaired *t*-test and categorical variables were compared using Pearson's χ^2 -test. To identify factors associated with compulsive Internet use, a logistic regression was carried out, using the literature recommended CIUS cut-off value (≥ 7) as dependent variable. As independent variables, all reported variables available for psoriasis and CU were added (age, gender, disease [psoriasis/CU], disease duration, disease duration before consulting a physician for the first

time, utilization of healthcare system, PHQ-D, relationship status). Furthermore, two disease-specific models were calculated, including BSA and UCT, respectively. All crude odds ratios (OR) and 95% confidence intervals (CI) were calculated. To visualize multicollinearity, correlations were calculated and reported using the Spearman's rank correlation coefficient. To minimize it, all variables were added in a multiple regression model and selected via backward selection. After elimination, adjusted ORs (aOR) and respective 95% CIs were calculated. IBM SPSS Statistics (Version 25, IBM Corporation, Armonk, NY, USA) was used for all analyses and alpha was set to 0.05.

3 | RESULTS

3.1 | Participants' characteristics and comparison of disease

Overall, 3222 individuals opened the first page of the survey and 1686 completed it, resulting in a rate of 50.8% (Figure 1). Of the included 1686 participants, 74.0% were female and the participants' mean age was 36.9 ± 12.9 years. More participants with CU took part ($n_{\text{cu}} = 1037$ vs $n_{\text{pso}} = 649$) and those included a higher proportion of females (89.2% vs 49.8%, $P < 0.001$) as well as a younger mean age (33.4 ± 10.9 years vs 42.5 ± 13.7 years, $P < 0.001$). Mean UCT was 7.9 ± 3.9 , indicating that 79.6% of participants with CU were uncontrolled. Mean BSA was 6.1 ± 8.0 , with a mild disease in 83.6% of participants with psoriasis. Individuals with psoriasis indicated a longer disease duration (18.1 ± 12.7 years vs 10.0 ± 9.3 years, $P < 0.001$)

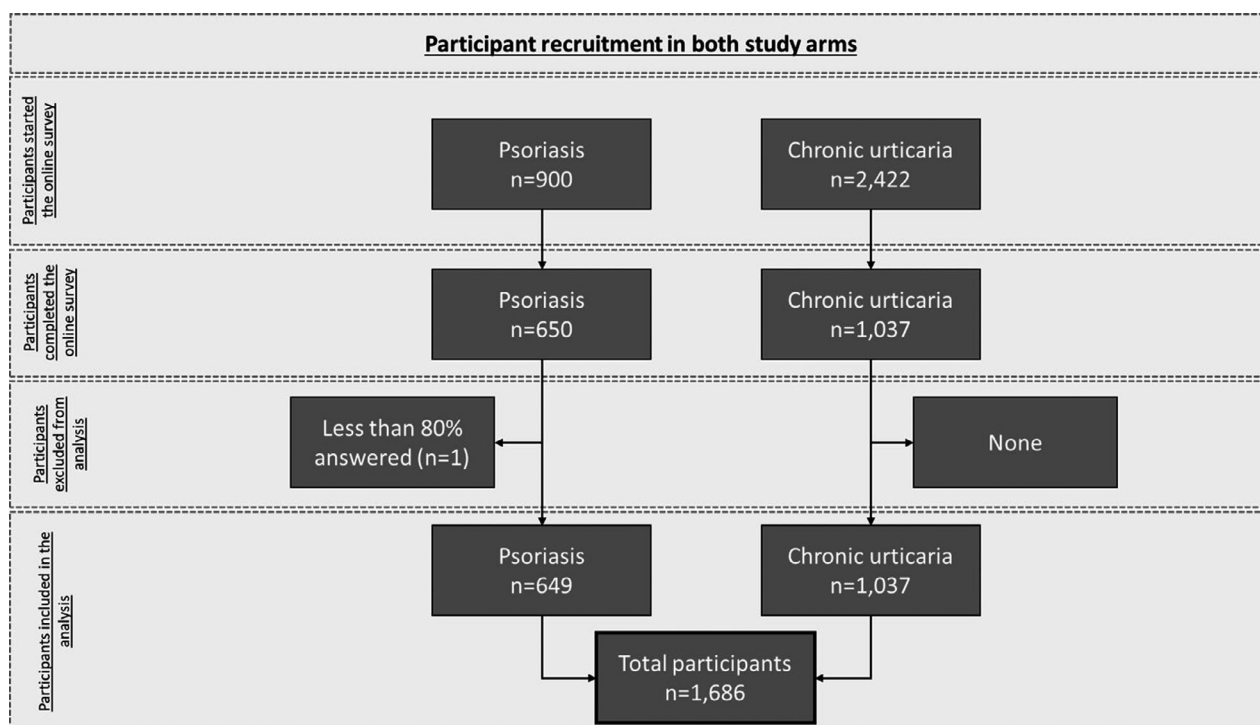


FIGURE 1 Flow chart of participant recruitment and exclusions in both study arms.

and a longer timespan between the first symptoms and consulting a physician (7.0 ± 7.9 years vs 3.6 ± 5.4 years, $P < 0.001$). Around 70% of participants in both groups scored ≥ 1 on the PHQ-D, which indicates a psychosocial disturbance, and about one in two participants scored 2, which indicates further investigation for the presence of a depressive tendency.

3.2 | Estimated prevalence of Internet addiction

In the CU group, people not in medical care had significantly higher CIUS scores (5.0 ± 3.8 vs 4.2 ± 3.6 , $P = 0.001$) and a higher proportion of positive screenings for compulsive Internet use (cut-off ≥ 7) than those receiving medical care (29.4% vs 22.6%, $P = 0.014$; Table 2). In the psoriasis group, no difference was observed (Table 2). Participants not consulting a physician reported a longer time spent online within a week (21.4 ± 20.2 h/week vs 19.9 ± 18.8 h/week, $P = 0.130$).

Overall, 16.0% of participants were screened positive for compulsive Internet use (cut-off ≥ 9), indicating an Internet addiction. The proportion of positive screenings was not significantly higher among participants not receiving medical care (17.6% vs 14.2%, $P = 0.058$) and participants with CU (16.9% vs 14.6%, $P = 0.223$; Figure 2).

3.3 | Associated factors for Internet addiction

Of all participants, 1618 (96.0%) had complete datasets and were included in the first logistic regression model. The chance of having a positive screening for Internet addiction decreased with rising age

(aOR = 0.97, 95% CI 0.96–0.98; Table S1). Compared to that, being not in medical care (aOR = 1.30, 95% CI 1.03–1.63), not being in a relationship (aOR = 1.32, 95% CI 1.02–1.70), and having higher scores in the PHQ-D were associated with a positive screening for Internet addiction (aOR_{PHQ-D=1} = 1.51, 95% CI 1.06–2.14; aOR_{PHQ-D=2} = 2.35, 95% CI 1.78–3.11; Figure 3).

When stratified by disease, the association of gender vanished in both diseases. The high correlation coefficient of gender and disease ($r_s = 0.44$, $P < 0.001$; Table S2) therefore indicated the effect-modifying nature of gender in this model. Furthermore, the association of medical care and compulsive Internet use vanished in participants with psoriasis, while the aOR increased in CU (aOR = 1.49, 95% CI 1.10–2.02).

3.4 | Stratification by the utilization of medical care

The proportion of people currently not in medical care was significantly higher among individuals suffering from CU than psoriasis (60.3% vs 45.9%, $P < 0.001$; Table 1). In general, participants currently receiving medical care were younger (35.6 ± 12.5 years vs 38.5 ± 13.2 , $P < 0.001$) and had waited longer after onset of symptoms until they consulted a physician (6.4 ± 7.7 years vs 4.8 ± 6.6 years, $P < 0.001$). They showed a longer disease duration (13.6 ± 11.3 years vs 12.3 ± 11.5 years, $P = 0.026$) compared to individuals who reported not receiving medical care. Patients with CU in medical care showed a lower UCT (6.9 ± 3.9 vs 8.5 ± 3.8 , $P < 0.001$), indicating that they had a less controlled disease. Additionally, participants with CU not seeking medical care showed an increased CIUS score (5.0 ± 3.8 vs 4.2 ± 3.6 , $P < 0.001$) and more positive screenings for

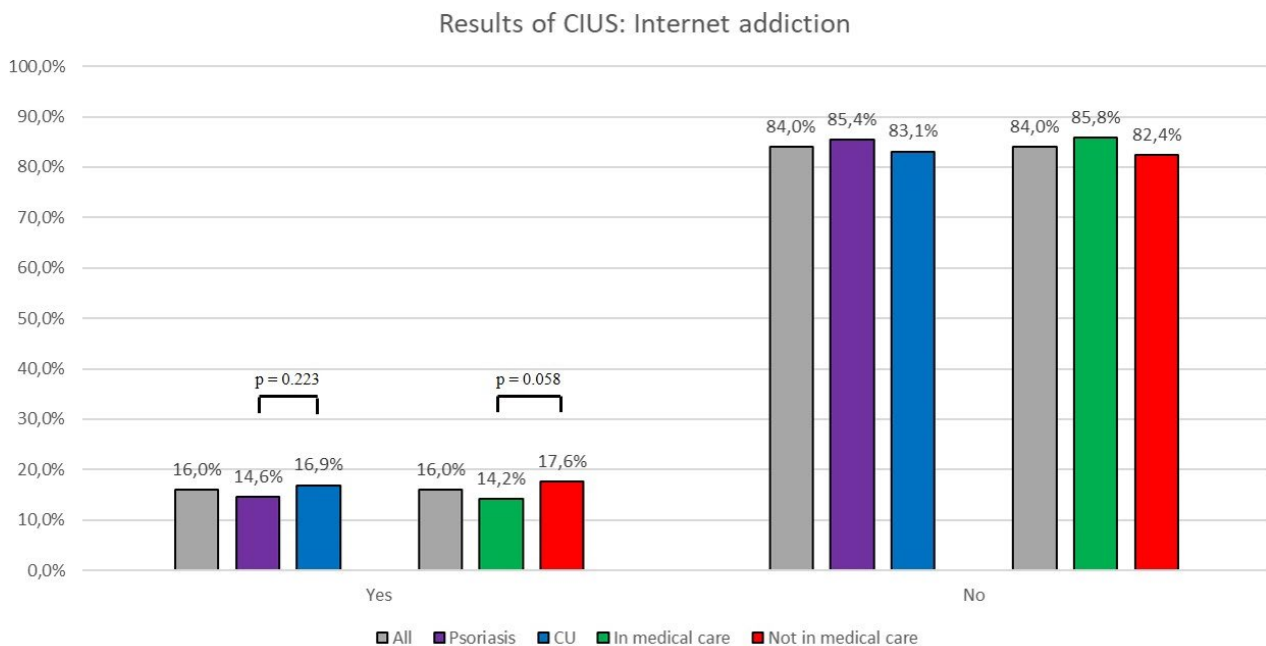


FIGURE 2 Prevalence of positive screenings for Internet addiction (results of the short form of the Compulsive Internet Using Scale; cut-off ≥ 9) stratified by disease and utilization of medical care. CU, chronic urticarial; CIUS, short form of the Compulsive Internet Using Scale.

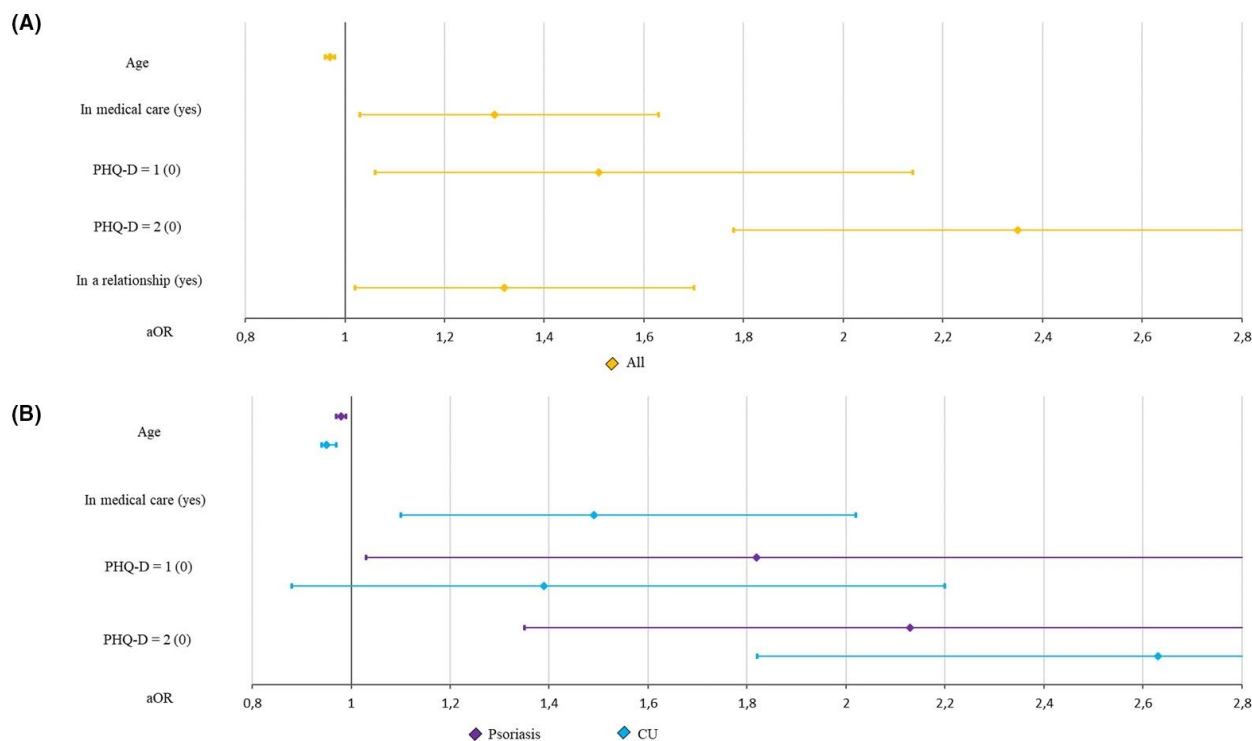
Factors associated with compulsive Internet use in an adjusted model for A) all participants and B) participants stratified by disease


FIGURE 3 Results of the multiple regression that showed associated factors with the positive screening on compulsive Internet use: (A) including all participants; (B) stratified by disease. aOR, adjusted odds ratio; age in years; PHQ-D, short version of the patient health questionnaire.

compulsive Internet use (29.4% vs 22.6%, $P = 0.014$) compared to those who were in medical care. Participants with psoriasis showed the same trend, but it was not significant. Furthermore, PHQ-D was more likely to be higher in participants seeing a physician for their CU, while no significant difference was identified within participants with psoriasis (Table 2).

4 | DISCUSSION

The aims of this study were (i) to estimate the prevalence of Internet addiction among people with psoriasis and CU reached online; and (ii) to identify differences in healthcare utilization between both diseases. By using online advertisements, a high proportion of individuals who were currently not in medical care was reached. Positive screening rate for Internet addiction was high and the chance to have a positive screening was higher in younger participants, in individuals who were currently not seeing a doctor, and in individuals having depressive tendencies.

4.1 | Stratification by disease

Although it is reported that females have a slightly higher prevalence for CU than men,^{3,34} the proportion of females with reported

CU in this study was very high. One possible explanation might be the higher frequency of young individuals and women searching for health-related information online.^{33–35} However, this assumption is not supported by age and gender distribution compared to individuals with psoriasis participating in the survey. It remains unclear why these gender differences were reached and needs future research.

4.2 | Estimated prevalence of Internet addiction

Reported values of Internet addiction in Germany among the general population range from 1.0% to 5.0%, depending on age group.^{36,37} In 2014, a large German study including 8130 individuals reported an Internet addiction prevalence of 1.0% to 1.5%.³⁸ Accordingly, the herein found rate for positive screening of 16.0% appears to be tremendously high. One important reason for these considerable differences could be that participants showing symptoms of an Internet addiction are more likely to spend more time online and therefore are reached via an online survey or online advertisements. As this study online included people reached online, individuals with no access to the Internet were not able to participate in this study. However, a comparable study reported a prevalence of 1.2% among 249 regular Internet users. The authors also relied on a web-based design using Facebook for recruitment and the study period lasted less than 2 months.³⁷ The study results, however, not only indicated a higher

TABLE 1 General characteristics of study population stratified by disease

	Total (n = 1686)	Participants stratified by disease		p-value
		Psoriasis (n = 649)	Chronic Urticaria (n = 1037)	
Age [mean ± SD]	36.9 ± 12.9	42.5 ± 13.7	33.4 ± 10.9	<0.001
Gender [n (%)]				
Female	1248 (74.0)	323 (49.8)	925 (89.2)	<0.001
Male	438 (26.0)	326 (50.2)	112 (10.8)	
BSA				
[mean ± SD]	NA	6.1 ± 8.0	NA	NA
[n (%)]				
Mild	NA	539 (83.6)	NA	
Moderate/severe	NA	106 (16.4)	NA	
Missing	NA	4	NA	
UCT				
[mean ± SD]	NA	NA	7.9 ± 3.9	
[n (%)]				
Controlled	NA	NA	212 (20.4)	
Poorly controlled	NA	NA	825 (79.6)	
Disease duration				
[mean ± SD, years]	13.0 ± 11.4	18.1 ± 12.7	10.0 ± 9.3	<0.001
[n (%)]				
≤10 years	871 (53.8)	216 (35.3)	655 (65.1)	<0.001
>10 years	747 (46.2)	396 (64.7)	351 (34.9)	
Disease duration before consulting a physician [mean ± SD, years]	5.7 ± 7.3	3.6 ± 5.4	7.0 ± 7.9	<0.001
Currently in medical care [n (%)]				
Yes	763 (45.3)	351 (54.1)	412 (39.7)	<0.001
No	923 (54.7)	298 (45.9)	625 (60.3)	
Profession [n (%)]				
Full-time	812 (48.2)	348 (53.6)	464 (44.7)	<0.001
Part-time	322 (19.1)	91 (14.0)	231 (22.3)	
Other	472 (28.0)	174 (26.8)	298 (28.7)	
Unemployed	80 (4.7)	36 (5.5)	44 (4.2)	
PHQ-D score [n (%)]				
0	503 (29.8)	213 (32.8)	290 (28.0)	0.087
1	333 (19.8)	118 (18.2)	215 (20.7)	
2	850 (50.4)	318 (49.0)	532 (51.3)	
In a relationship [n (%)]				
Yes	1273 (75.5)	485 (74.7)	788 (76.0)	0.559
No	413 (24.5)	164 (25.3)	249 (24.0)	
CIUS score [mean ± SD]	4.6 ± 3.6	4.4 ± 3.5	4.7 ± 3.7	0.157
Compulsive Internet use [n (%)]				
Yes	431 (25.6)	154 (23.7)	277 (26.7)	0.172
No	1255 (74.4)	495 (76.3)	760 (73.3)	

Differences were compared using an unpaired t-test and χ^2 -test. Significant results are shown in bold.

BSA, body surface area (self-stated); CIUS, short form of the Compulsive Internet Using Scale; NA, not applicable; PHQ-D, short version of the patient health questionnaire; SD, standard deviation; UCT, Urticaria Control Test.

TABLE 2 General characteristics of participants stratified by utilization of healthcare system and disease

	Total (n = 1686)		Psoriasis (n = 649)		Chronic Urticaria (n = 1037)		P value
	In medical care (n = 763)	Not in medical care (n = 923)	In medical care (n = 351)	Not in medical care (n = 298)	In medical care (n = 412)	Not in medical care (n = 625)	
Age [mean ± SD]	38.5 ± 13.2	35.6 ± 12.5	43.7 ± 13.7	41.0 ± 13.7	34.0 ± 10.9	33.0 ± 10.9	0.159
Sex [n (%)]							
Female	539 (70.6)	709 (76.8)	172 (49.0)	151 (50.7)	367 (89.1)	558 (89.3)	0.918
Male	224 (29.4)	214 (23.2)	179 (51.0)	147 (49.3)	45 (10.9)	67 (10.7)	
BSA [mean ± SD]	6.4 ± 8.0	5.7 ± 8.1	6.4 ± 8.0	5.7 ± 8.1	NA	NA	NA
UCT [mean ± SD]	6.9 ± 3.9	8.5 ± 3.8	NA	NA	6.9 ± 3.9	8.5 ± 3.8	<0.001
Disease duration [mean ± SD, years]	12.3 ± 11.5	13.6 ± 11.3	16.9 ± 12.7	19.5 ± 12.6	8.5 ± 8.7	10.9 ± 9.5	<0.001
Disease duration before consulting a physician [mean ± SD, years]	4.8 ± 6.6	6.4 ± 7.7	3.5 ± 5.3	3.7 ± 5.6	5.9 ± 7.3	7.7 ± 8.2	<0.001
PHQ-D score [n (%)]							
0	199 (26.1)	304 (32.9)	112 (31.9)	101 (33.9)	87 (21.1)	203 (32.5)	<0.001
1	163 (21.4)	170 (18.4)	67 (19.1)	51 (17.1)	96 (23.3)	119 (19.0)	
2	401 (52.6)	499 (48.6)	172 (49.0)	146 (49.0)	229 (55.6)	303 (48.5)	
Hours per week spent on the Internet for leisure [mean ± SD]	19.9 ± 18.8	21.4 ± 20.2	19.3 ± 18.8	22.1 ± 21.7	20.5 ± 18.7	21.1 ± 19.4	0.654
CIUS score [mean ± SD]	4.3 ± 3.5	4.8 ± 3.7	4.3 ± 3.5	4.5 ± 3.6	4.2 ± 3.6	5.0 ± 3.8	0.001
Compulsive Internet use [n (%)]							
Yes	172 (22.5)	259 (28.1)	79 (22.5)	75 (25.2)	93 (22.6)	184 (29.4)	0.014
No	591 (77.5)	664 (71.9)	272 (77.5)	223 (74.8)	319 (77.4)	441 (70.6)	

Differences were compared using an unpaired t-test and χ^2 -test. Significant results are shown in bold.

BSA, body surface area (self-stated); CIUS, short form of the Compulsive Internet Using Scale; NA, not applicable; PHQ-D, short version of the patient health questionnaire; SD, standard deviation; UCT, Urticaria Control Test.

rate of Internet addiction in comparison to the general population, but also in comparison with two previous studies among people with psoriasis. For example, in a study among individuals with psoriasis reached via online self-help groups the reported prevalence was 8.5%¹² and in a study among psoriasis patients recruited offline, in clinics and dermatological offices, the prevalence was 3.8%.¹¹ Therefore, the way affected individuals are reached seems to be essential for the frequency of positive screenings for Internet addiction. Although using an online setting to investigate Internet addiction might overestimate the actual problem, this might not be the only reason for these large differences, but also promotes the use of online tools and advertisements to reach a potentially vulnerable subsample of people with chronic skin diseases. While there is no evidence on rate of Internet addiction among people with CU in the literature so far, a previous study indicated compulsive tendencies in patients with urticarial.³⁹ This is an important finding and needs further investigation.

4.3 | Associated factors for Internet addiction

As in the literature, Internet addiction was associated with younger age³⁷ and showed no gender differences.³⁸ Additionally, the study confirmed depressive tendency being positively associated with Internet addiction.^{40,41} As this is the first study which has investigated the issue in chronic skin disease including individuals with and without contact to a physician, it is highly interesting that affected individuals who were currently not in medical care had a higher chance of a positive screening for Internet addiction. When stratified by disease, this difference vanished in participants with psoriasis, while it increased in participants with CU. In combination with the diminishing effects of relationship status due to stratification, this indicated the role of disease as possible confounder. Therefore, the exact nature of this association and potential causality should be investigated in future studies. Further studies are needed and registry data or data including a suitable control group might be highly beneficial.

4.4 | Stratification by the utilization of medical care

The study indicated that people not in medical care had a milder disease form which might be due to the fact that their disease might be already controlled compared to those who are receiving medical care. The mean UCT value of 8.5 was remarkably below the score indicating a controlled disease (= 12). Indeed, three out of four people not in medical care indicated an uncontrolled CU. However, controlling the disease was reported to be a major aim in CU^{34,42,43} and the proportion of poorly controlled individuals was higher in this study than previously reported in the literature (79.6% vs 36.5%).³⁴ A possible explanation might be that individuals with less controlled CU are more likely to be bothered and therefore search for information online. Subsequently, the study's specific advertisements might mainly have reached these individuals. Even modern and effective therapies do not have an added value if people do not receive them.⁴⁴

The longer disease duration of participants of both groups not in medical care underlines the necessity of medical advice and care. Furthermore, it could indicate a drop out of medical care as a result of long disease duration and frustrated expectations in sufficient and promising treatments. This would be in accordance with previous findings.⁴⁵

Participants with CU receiving medical care reported depressive tendencies more often. While about one in three participants not seeing a physician showed no signs of depressive tendency, in the subgroup of participants currently under medical care only one in five did. An explanation for this difference might be the high proportion of poorly controlled CU in the first group, which is reported to be highly burdening.⁴⁶ Furthermore, physicians, especially dermatologists, could be sensitized to this issue.

4.5 | Limitations and strengths

There are some study limitations. First, study participants self-reported that they suffered from either psoriasis or CU and study fraud cannot be excluded. Measures to minimize the chance of including bots and fraudsters were taken in accordance with existing literature (no "back" button, plausibility checks).⁴⁷ However, due to the anonymous study design measures including geolocation or the IP-address of participants were not feasible, even though they were shown to be highly effective.^{47,48} Furthermore, all answers were self-stated and so, for example, BSA in participants with psoriasis might differ from actual BSA measured by a dermatologist. Another limitation is that no exact response rate can be stated. It is known that 50.8% of individuals who reacted via the advertisement took part in the survey, but it is unclear for how many Internet users the survey was displayed. Additionally, there was a large potential of selection bias. The proportion of female participants was extremely high, although there are no considerable differences in the prevalence of psoriasis and CU among females and males. Furthermore, only individuals with Internet access and only those actively searching for psoriasis- or CU-related topics were reached. This substantially reduces the chance of achieving a representative sample of all individuals with psoriasis and CU, respectively. However, this might also be a major strength of this study: participants might not be representative for all individuals with psoriasis or CU, but it highlights the need to reach affected individuals. Those individuals suffering from the symptoms of their disease might be more likely to search online and subsequently react to the advertised posts. Furthermore, more than half of all participants were not in medical care and therefore are highly unlikely to be reached throughout conservative epidemiological studies and registries focusing on patients instead of all affected people. Consequently, this approach might contribute to broaden the horizon of medical research and could be promising to address individuals with high disease burden and no contact with a physician.

5 | CONCLUSION

In conclusion, many individuals with psoriasis and CU were reached through this online survey, and of those a large proportion reported to receive no medical care. The study revealed a high occurrence of Internet addiction in participants, demonstrating that individuals with CU not in medical care have a higher chance of being screened positive. Accordingly, these findings underline the importance of a people-centered approach and the potential of online settings for dermatological research.²⁸ Additionally, this study reveals that online surveys might be a valuable tool if vulnerable groups have to be included in future research. Future studies could include an age- and gender-adjusted control group as well as health insurance data to clarify whether the risk of Internet addiction is increased among patients with psoriasis or CU. Such studies should focus on identifying ways to reach individuals not seeking medical care despite suffering from these diseases.

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CONFLICT OF INTEREST

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section.

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