the eyelid dermatitis in parallel with respiratory improvement strongly suggests an association between skin manifestations and COVID-19. However, vitamin supplements (especially vitamin C) can also bring partial benefit in the setting of capillaritis and small-vessel dysfunction.[10]

The present report gives a new insight into COVID-19-associated cutaneous findings and can therefore help clinicians in identifying early signs of the disease. In fact, the great variability of COVID-19-related dermatological disorders gives reason of the difficulties encountered by dermatologists and other physicians in recognizing SARS-CoV2 infection and therefore in treating patients accordingly.

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Informed consent
The patients in this manuscript have given written informed consent to publication of their case details.

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COVID-19 pandemic and autoimmune bullous diseases: a cross-sectional study of the International Pemphigus and Pemphigoid Foundation

Editor

Autoimmune bullous diseases (AIBDs) are rare and potentially life-threatening chronic inflammatory disorders that are difficult to manage during the COVID-19 outbreak.[1,2] Our objective was to investigate the associations of outdoor activity restriction, income loss and treatment non-adherence with self-reported outcomes and to determine the satisfaction level with teledermatology platforms in patients with AIBDs during the COVID-19 pandemic.

In this cross-sectional study, English-speaking AIBD patients aged >18 years, who were recruited from the database of the International Pemphigus and Pemphigoid Foundation, were asked to complete a COVID-19 pandemic-related Web-based survey between 30 July 2020 and 1 October 2020. The online poll and its rating system were adapted with minor modifications from Kuang *et al.*,[3] Wang *et al.*[4] and Ruggiero *et al.*[5] Electronic informed consent was obtained from all patients, and the questionnaire was completed anonymously. The study was granted exemption by the Institutional Review Board of the University of Southern California. The primary outcome was deterioration of the disease, determined by the Global Rating of Change. The secondary outcomes included perceived stress and symptoms of anxiety and depression, which were assessed by the visual analogue scale, 2-item Generalized Anxiety Disorder and 2-item Patient Health Questionnaire, respectively. The cut-off points were ≥7, ≥3 and ≥3, respectively, according to previous studies.[3,4,6–8] The tertiary outcome was the satisfaction level of patients using telemedicine platforms (i.e. live interactive video-call visits). Logistic regression was used to estimate associations with adjustments for potential confounders. The effect size is presented as odds ratio, likelihood ratio and 95% confidence interval. P values < 0.05 were considered statistically significant.

Valid questionnaires including location data were collected from a total of 383 patients [276 females and 107 males; aged 19–95 (mean 59.9) years; 207 pemphigus vulgaris, 75 mucous

Table 1 Associations of outdoor activity restriction, income loss and treatment non-adherence with patient-reported outcomes of AIBDs

Patient-reported outcomes	Unrestricted outdoor activity (*n* = 87)		Partial restriction of outdoor activity (*n* = 185)			Complete restriction of outdoor activity (*n* = 111)			LR test	
	n (%)	OR	*n* (%)	OR (95% CI)	aOR (95% CI)†	*n* (%)	OR (95% CI)	aOR (95% CI)†	*P*	a*P*
Deteriorated disease	27 (31)	1	65 (35.1)	1.2 (0.7–2.1) *P* = 0.505	1 (0.6–1.8) *P* = 0.939	43 (38.7)	1.4 (0.8–2.5) *P* = 0.261	1 (0.5–1.9) *P* = 0.932	0.528	0.983
Perceived stress (VAS, ≥7)	23 (26.4)	1	55 (29.7)	1.2 (0.7–2.1) *P* = 0.576	1 (0.6–1.8) *P* = 0.995	46 (41.4)	**2 (1.1–3.6)** ***P* = 0.028**	1.6 (0.8–3) *P* = 0.183	**0.048**	0.224
Anxiety (GAD-2, ≥3)	18 (20.7)	1	69 (37.3)	**2.3 (1.3–4.1)** ***P* = 0.006**	**2 (1.1–3.8)** ***P* = 0.021**	47 (42.3)	**2.8 (1.5–5.3)** ***P* = 0.001**	**2.4 (1.2–4.8)** ***P* = 0.01**	**0.003**	**0.021**
Depression (PHQ-2, ≥3)	18 (20.7)	1	58 (31.4)	1.8 (1–3.2) *P* = 0.069	1.5 (0.8–2.8) *P* = 0.198	46 (41.4)	**2.7 (1.4–5.2)** ***P* = 0.002**	1.9 (1–3.8) *P* = 0.065	**0.007**	0.175
Patient-reported outcomes	**Income unaffected (*n* = 254)‡**		**Partial income loss (*n* = 100)**			**Complete income loss (*n* = 29)**			**LR test**	
	n (%)	OR	*n* (%)	OR (95% CI)	aOR (95% CI)†	*n* (%)	OR (95% CI)	aOR (95% CI)†	*P*	a*P*
Deteriorated disease	83 (32.7)	1	40 (40)	1.4 (0.9–2.2) *P* = 0.193	1.4 (0.8–2.4) *P* = 0.256	12 (41.4)	1.5 (0.7–3.2) *P* = 0.349	**0.3 (0.1–1)** ***P* = 0.045**	0.336	**0.033**
Perceived stress (VAS, ≥7)	71 (28)	1	38 (38)	1.6 (1–2.6) *P* = 0.066	1.3 (0.7–2.2) *P* = 0.387	15 (51.7)	**2.8 (1.3–6)** ***P* = 0.01**	1.7 (0.6–4.6) *P* = 0.275	0.015	0.449
Anxiety (GAD-2, ≥3)	80 (31.5)	1	40 (40)	1.4 (0.9–2.3) *P* = 0.129	1.5 (0.9–2.6) *P* = 0.138	14 (48.3)	2 (0.9–4.4) *P* = 0.073	1.7 (0.6–4.4) *P* = 0.296	0.099	0.253
Depression (PHQ-2, ≥3)	71 (28)	1	42 (42)	**1.9 (1.2–3)** ***P* = 0.011**	**2.3 (1.3–4.1)** ***P* = 0.003**	9 (31)	1.2 (0.5–2.7) *P* = 0.727	0.9 (0.3–2.5) *P* = 0.813	**0.041**	**0.009**
Patient-reported outcomes	**Treatment adherence (*n* = 353)**		**Treatment non-adherence (*n* = 30)**			**LR test**				
	n (%)	OR	*n* (%)	OR (95% CI)	aOR (95% CI)†	*P*	a*P*			
Deteriorated disease	118 (33.4)	1	17 (56.7)	**2.6 (1.2–5.5)** ***P* = 0.013**	2 (0.8–4.6) *P* = 0.122	**0.012**	0.123			
Perceived stress (VAS, ≥7)	113 (32)	1	11 (36.7)	1.2 (0.6–2.7) *P* = 0.601	0.7 (0.3–1.7) *P* = 0.428	0.604	0.422			
Anxiety (GAD-2, ≥3)	120 (34)	1	14 (46.7)	1.7 (0.8–3.6) *P* = 0.166	1.8 (0.8–4.1) *P* = 0.183	0.17	0.186			
Depression (PHQ-2, ≥3)	113 (32)	1	9 (30)	0.9 (0.4–2.1) *P* = 0.82	0.9 (0.3–2.2) *P* = 0.739	0.82	0.737			

a, adjusted; AIBDs, autoimmune bullous diseases; CI, confidence interval; GAD-2, 2-item Generalized Anxiety Disorder; LR, likelihood ratio; OR, odds ratio; PHQ-2, 2-item Patient Health Questionnaire; VAS, visual analogue scale.

†Adjusted for location of study participants, age, gender, education, annual income, marital status, comorbidities, disease type, disease duration, affected body surface area, mucosal involvement, income loss, treatment non-adherence and COVID-19 status. ‡Twelve out of these patients reported increased income.

membrane pemphigoid, 59 bullous pemphigoid, 31 pemphigus foliaceus and 11 other AIBDs]. Responses to the online questionnaire came from North America ($n = 320$), Europe ($n = 26$), Asia ($n = 15$), South America ($n = 11$), Africa ($n = 4$), Australia ($n = 4$) and New Zealand ($n = 3$). Eleven (2.8%) patients reported confirmed infection with SARS-CoV-2. 35.2% patients reported a moderate to great exacerbation of their AIBD. The proportions of perceived stress, anxiety and depression were 32.4%, 35% and 31.9%, respectively. Outdoor activity restriction was associated with stress, anxiety and depression. Income loss was associated with stress and depression. Treatment non-adherence was associated with disease aggravation. After adjustment for confounders, relationships remained between outdoor activity restriction and anxiety as well as between income loss and depression. Confounder adjustment further revealed an association between income loss and disease deterioration (Table 1). Thirty-five (9.1%) patients consistently reported to have consulted a dermatologist through telemedicine platforms, and there was a high satisfaction level (score 7–10) in the majority of patients (72.4–90.3%) who used this virtual healthcare service through videoconferencing (Table 2).

Table 2 Six-item questionnaire using a 0–10 scale (score 0–3: negative; 4–6: not bad not good; 7–10: positive): scores reported in 35 autoimmune bullous disease patients

Scores	A	B	C[1]	D[2]	E[3]	F
	No. of patients	No. of patients	No. of patients	No. of patients	No. of patients	No. of patients
0	1 (2.9%) *4 (11.4%)[4]*	0 (0%) *4 (11.4%)[4]*	2 (6.9%) *5 (17.2%)[4]*	0 (0%) *1 (3.1%)[4]*	1 (3.2%) *3 (9.7%)[4]*	1 (2.9%) *5 (14.3%)[4]*
1	1 (2.9%)	1 (2.9%)	1 (3.4%)	0 (0%)	1 (3.2%)	0 (0%)
2	1 (2.9%)	3 (8.6%)	1 (3.4%)	0 (0%)	1 (3.2%)	2 (5.7%)
3	1 (2.9%)	0 (0%)	1 (3.4%)	1 (3.1%)	0 (0%)	2 (5.7%)
4	0 (0%) *4 (11.4%)[5]*	3 (8.6%) *4 (11.4%)[5]*	0 (0%) *3 (10.3%)[5]*	1 (3.1%) *6 (18.8%)[5]*	0 (0%) *0 (0%)[5]*	0 (0%) *2 (5.7%)[5]*
5	2 (5.7%)	1 (2.9%)	2 (6.9%)	5 (15.6%)	0 (0%)	1 (2.9%)
6	2 (5.7%)	0 (0%)	1 (3.4%)	0 (0%)	0 (0%)	1 (2.9%)
7	1 (2.9%) *27 (77.1%)[6]*	3 (8.6%) *27 (77.1%)[6]*	1 (3.4%) *21 (72.4%)[6]*	1 (3.1%) *25 (78.1%)[6]*	0 (0%) *28 (90.3%)[6]*	4 (11.4%) *28 (80%)[6]*
8	4 (11.4%)	2 (5.7%)	2 (6.9%)	6 (18.8%)	2 (6.5%)	1 (2.9%)
9	4 (11.4%)	5 (14.3%)	4 (13.8%)	0 (0%)	3 (9.7%)	0 (0%)
10	18 (51.4%)	17 (48.6%)	14 (48.3%)	18 (56.2%)	23 (74.2%)	23 (65.7%)

(A) I was satisfied with the attention paid by the doctor to my disease. (B) I was satisfied with the time spent by the doctor with me. (C) I was satisfied with the treatment I received. (D) I was satisfied with the convenience compared to a regular clinic visit. (E) I was satisfied with the coronavirus safety compared to a regular clinic visit. (F) What is the likelihood that you would use this dermatology telemedicine service again?
[1]Six patients did not provide a score. [2]Three patients did not provide a score. [3]Four patients did not provide a score. [4–6]Numbers (in italic) represent the sum of scores 0–3, 4–6 and 7–10, respectively.

Our results emphasize the negative impact of the COVID-19 outbreak on health outcomes in patients with AIBDs and indicate a high satisfaction with telemedicine platforms at this difficult time, although the prevalence rates of stress, anxiety and depression were comparable to the general population during the COVID-19 pandemic (i.e. 29.6%, 31.9% and 33.7%, respectively).[9] Appropriate healthcare delivery solutions, including a public mental health response, are required to improve the health of vulnerable individuals in the COVID-19 era.

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Follow-up of dermatological manifestations in non-critical hospitalized patients with COVID-19 pneumonia and their prognostic correlation with disease severity

Dear Editor,

COVID-19 is currently one of the main causes of death worldwide. This virus affects mainly the lower respiratory system, but significant damage to other organs has been observed. Cutaneous manifestations related to the aforementioned viral infection have been reported with an incidence that ranges between 0.20% and 20%. The period between the appearance of cutaneous lesions and COVID-19 infection remains uncertain.[1,2]

With the information that exists, one can speculate that cutaneous manifestations of COVID-19 can be classified into two groups

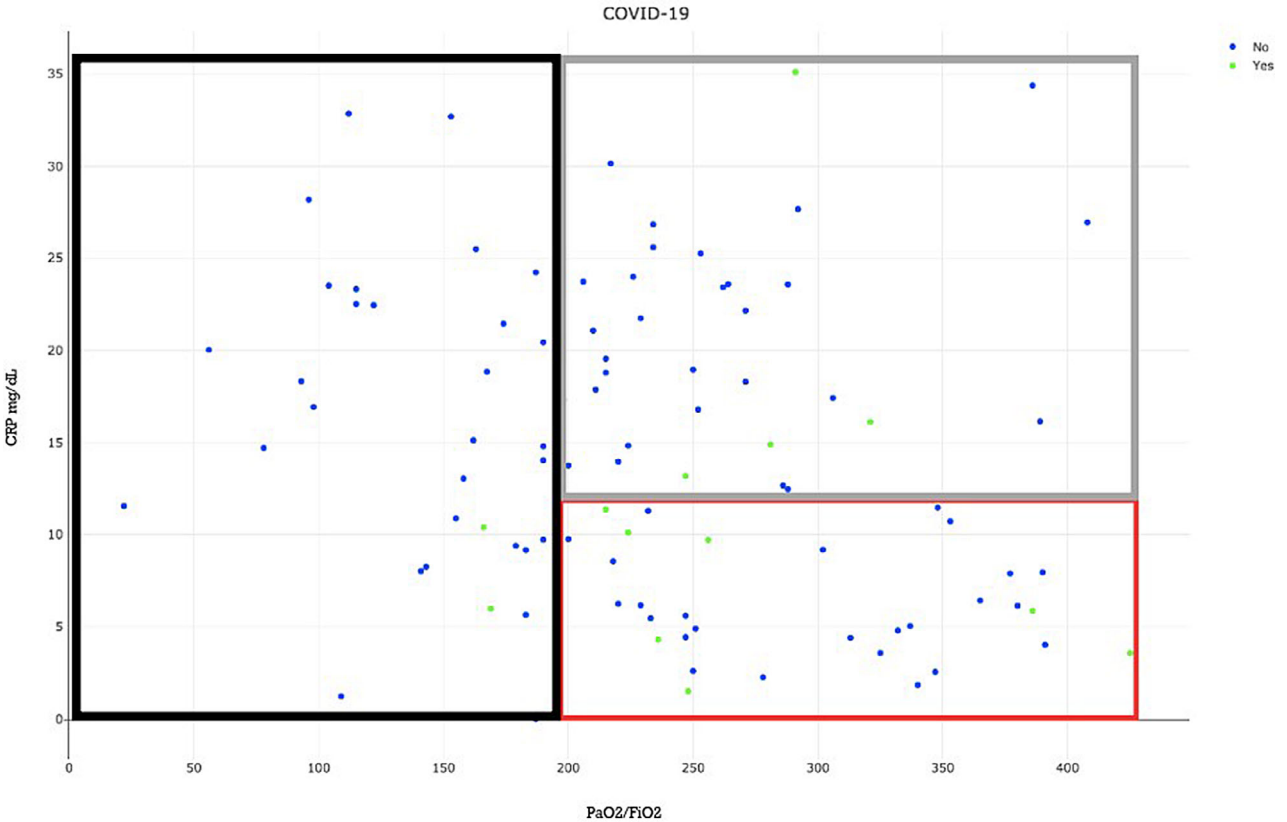

Figure 1 In this graphic, patients with cutaneous manifestations (blue dots) and without cutaneous manifestations (green dots) are plotted according to their prognosis using clinical and biochemical variables. The red box represents patients with a P/F ratio >200 and CRP <11 mg/dL. The grey box represents patients with a P/F ratio >200 and CRP >11 mg/dL. The black box represents patients with a P/F ratio <200 and CRP >11 mg/dL.