





RESEARCH ARTICLE



Psoriasis healthcare during the COVID-19 pandemic: a survey among psoriasis patients (PsoCovidCare)

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ABSTRACT

Background: During the COVID-19 pandemic, psoriasis care underwent significant changes in consultation methods and treatment management. However, comprehensive data on these changes and patient perceptions are limited.

Aims: To evaluate the pandemic's implications on psoriasis patients, focusing on access to information, consultation methods, patient satisfaction, disease control assessment, and treatment management changes.

Methods: A multicenter cross-sectional survey was performed in psoriasis patients from 4 dutch hospitals during the second wave of the pandemic.

Results: Among 551 respondents, approximately 55% received information their treatment in relation to COVID-19 from their treating physician, while 16.3% sought information online. Consultation methods were shifted to remote formats for 43.6% of patients, primarily *via* phone and the shift was often initiated by physicians. Overall patient satisfaction during the pandemic scored high (8.0), with remote consultations scoring between 8.0–9.0. Patients on biological treatment reported better disease control (8.0), compared to those on topical (6.0) or conventional systemic treatments (7.0). However, within the systemic treatment group and biologics group, a notable percentage interrupted (16.3% resp. 12.9%) or discontinued treatment (14.1 resp. 10.6%) during the pandemic. Disease control was moderate-to-good assessed by 75% of patients receiving face-to-face and 68% receiving remote consultations.

Conclusion: Remote care appears to be a viable alternative to face-to-face consultations, with potential benefits in enhancing access to information provided by treating physicians.

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SARS-COV-2; COVID-19; psoriasis; biologics; remote care

Introduction



Psoriasis is a chronic inflammatory skin disease. Severity of disease often dictates the therapeutic approach. Topical agents are generally used for milder psoriasis, and phototherapy, conventional systemics or biologics for more extensive disease. During the COVID-19 pandemic, questions were raised about how to use treatment for psoriasis and the best way to provide care for the patients. Physicians were often challenged to bridge barriers and gaps in care, as non-acute care was widely scaled down due to lockdowns (1). Remote care has been used to replace face to face (F2F) care as minimizing exposure to the virus reduced the risk of spreading disease. Especially for patients treated with conventional systemics or biologics, a major concern was fear of having a more severe outcome when contracting COVID-19 (2–5). Currently, there is limited data available assessing patient comfort levels about these applied changes in healthcare

delivery (6,7). The objective of this cross-sectional survey study was to assess the implications of the pandemic on patients with psoriasis regarding (1) access to information, (2) change of consultation method, (3) patient satisfaction on received care and self-assessed disease control, and (4) changes in treatment management.

Patients and methods

Data collections methods

The current study is a sub-investigation of the PsoCovid study, a multi-center cross sectional survey study (8). Adult patients who have received treatment for psoriasis (either biologics (BT), conventional systemic treatment (ST) or topical treatment (TT)) in the period from March 2021–October 2021 (second wave of the

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pandemic) in one of three Dutch regional hospitals (dermaTeam clinic, Bravis hospital and Rijnstate hospital) and one university hospital (Radboud University medical center Nijmegen) were included. Patients were excluded if they were treated with immunosuppressive therapy for other indications than psoriasis and/or when they were unable to fill out the questionnaire. The study was approved by the Ethics Committee (CMO Arnhem-Nijmegen) and conducted in accordance with the declaration of Helsinki. Patients were contacted by their treating physician by a study invite letter. After signing informed consent patient were sent a survey.

Distribution of the patients over the 3 treatment groups were as follows: when a patient received a biologic for ≥ 3 consecutive months the patient was assigned to the BT group, when a patient received conventional systemic treatment for ≥ 3 consecutive months they were assigned to the ST-group. When patient received both a BT and ST for ≥ 3 consecutive months they were assigned to the BT group. Patients who were only treated with topical therapy were assigned to the TT group.

Survey design

In the survey, patients were questioned on demographics and treatment characteristics, (1) access to information regarding their treatment and COVID-19, (2) change of consultation method, (3) patient satisfaction on received care and self-assessed disease control, and (4) changes in treatment management.

Regarding access to information, we focused on how patients were informed during the pandemic about COVID-19 in context to their psoriasis treatment. For instance, caregivers could have provided this information through a (telephonic) consultation, by a letter, or by email. It is also possible that patients searched the Internet themselves. Patients were able to give multiple answers on how they retrieved and received information about COVID-19 and how they had to manage their psoriasis treatment during the pandemic. They were also asked to grade the experience between 0-10 (where 0 is the worst experience and 10 the best).

Changes in consultation methods were categorized as: like usual (as before COVID-19), (partly) changed to remote appointments (by chat/email, telephonic consultations and/or virtual consultations) or delayed/discontinued. Patients were able to give multiple answers. If their consultation methods were (partly) changed to remote appointments, they were asked to rate their experiences per type of remote appointment received on a scale of 0-10 (where 0 is the worst experience and 10 the best).

Regarding patient satisfaction on received care, patients were asked to rate the received dermatological care during COVID-19 on a scale of 0–10 (with 0 being the worst experience and 10 the best). Regarding self-assessed disease control, patients were asked to grade their disease control on a scale of 0–10 from start of the pandemic, with zero indicating that disease control was 'very bad' and ten 'very good'.

Changes in treatment management were evaluated separately for the ST and BT group. Change in treatment was divided into interruption or complete discontinuation. In addition, it was asked who initiated the change in treatment.

Data analysis

Data was descriptively analyzed and displayed for the total study group, per treatment group separately and per consultation type. Categorical variables were displayed as frequencies, with the total

number N and corresponding percentages. Continuous variables were displayed as mean \pm standard deviation (SD) or medians with their corresponding total or interquartile ranges [IQR] depending on their distribution. All data were analyzed using IBM SPSS Statistics version 26.0.

Results

Patient and treatment characteristics

In total, 3113 patients with psoriasis were identified based on electronic patient records and registries of the participating medical centers. Of these, 2177 eligible patients were invited to participate in the survey study. Of this group, 588 patients responded to the questionnaire. Seventeen patients were excluded due to reporting the use of other immunosuppressive drugs for non-psoriasis related indications and 20 patients did not complete the questionnaires. This resulted in a total of 551 (25%) patients with completed questionnaire data (Table 1) (8).

Access to information about COVID-19 in the context of psoriasis treatment

More than half (54.9% (303/551)) of the patients received information about COVID-19 and their treatment from their caregiver. This was mostly through a (telephonic) consultation (27.8%) or a letter (26.5%) (Table 2). Sixteen percent searched the internet themselves for information on this topic and 33.6% did not search or receive any information at all. All methods of access to information provided by the caregiver ((telephonic) consultation, letter, e-mail) were rated with a median score of 8.0. Searching on the internet by patients themselves resulted in a median score of 5.0. Scores were roughly similar when split per treatment group.

(Changes in) F2F care at department of dermatology

For the total group, almost half (49.4%, $N=272$) of the F2F care was 'like usual (before COVID-19)' (Table 2). For 43.6% ($N=240$) F2F care was at least partly changed to remote appointments. Of those 240 patients who partly changed to remote care it mostly included telephonic consultation (93,6%, 225/240). The other remote options (by chat/email or virtual consultation) were practiced very little with an overall percentage below 10.8%. Only in the TT group this was more common: 22.5% of patients reported receiving virtual consultations. All types of remote clinical care were rated around the same grade [7.0–10.0] by the 240 patients who received it. Delayed or discontinued care was reported by 8.5% (47/551) of the total group, and was highest in the TT group (20.4%, 30/147).

Initiator of change of clinical care

In the total group, changing usual care was most often initiated by the caregiver (54.4%), followed by a combination of caregiver and patient (21.3%) (Table 2). Change in usual care was least often initiated solely by the patient (7.3%).

Patient reported satisfaction with dermatological care during COVID-19 period

The patient reported satisfaction with dermatological care during COVID-19 was rated with an overall median score of 8.0 [IQR

Table 1. Patient and treatment characteristics of responding patients included in PsoCovid questionnaire (n=551).

	N (%), median [range min-max]	
Sex (male)	309	56.1%
Age at moment of study inclusion	59.0	[18–88]
Disease duration at study inclusion (years)	25.0	[0.5–67.0]
Psoriatic arthritis (yes)*	88	16.0%
Weight (kg)	84.0	[44.0–156.0]
BMI (kg/m ²)	27.1	[16.0–48.9]
Intoxications		
Smoking (yes, currently)	105	19.1%
Smoking (yes, only in past)	299	54.4%
Alcohol (yes)	360	65.5%
If yes, units/week	5.0	[0–25]
Recreational drugs	13	2.4%
Treatment		
Topical therapy (TT)	147	26.7%
Systemic immunosuppressive therapy (ST) without biologic**	178	32.3%
MTX	112	62.9% (of 178)
Fumaric acid ester	70	39.3%
Ciclosporin	7	3.9%
Acitretin	2	1.1%
Apremilast	1	0.6%
Biologic immunosuppressive therapy (BT)**	226	41.0%
Etanercept	20	8.8% (out of 226)
Adalimumab	66	29.2%
Infliximab	1	0.4%
Certolizumab-pegol	2	0.9%
Ustekinumab	71	31.4%
Secukinumab	26	11.5%
Ixekizumab	44	19.4%
Brodalumab	21	9.3%
Guselkumab	8	3.5%
Risankizumab	3	1.3%
Tildrakizumab	2	0.9%
Biologic combined with methotrexate	27	11.9%
Comorbidities		
Psoriatic arthritis*	88	16.0%
Chronic lung disease	47	8.5%
Chronic heart disease	47	8.5%
Diabetes Mellitus (type 1/2)	47	8.5%
Significant liver disease	4	0.7%
Significant kidney disease	1	0.2%
Transplant recipient	–	–
Hematological disease	3	0.5%
Auto-immune disease (excl. psoriasis/PsA)	38	6.9%
Severely impaired immune system or HIV/Aids	–	–
Radio- or chemotherapy for malignancy in '20/'21	–	–

BMI, body mass index; MTX, methotrexate.

*Percentage based on patients with known diagnosis and patients without diagnosis; patients with unknown diagnosis were excluded; Disease duration: 4 patient entries not reported; intoxications: 1 patient entry not reported.

**patients with biologics or systemic therapies were ≥3 months exposed to compound between march 2020-end of follow up, before being considered as active users. Note that for the breakdown in specific biologics/systemics, more biologics could have been used per patient.

8.0–10]. This was roughly the same for the 3 treatment groups separately (Table 2).

Patient reported disease control during COVID-19 period

The self-assessed disease control was rated with an overall median score of 7.0 [5.0–8.0] with the lowest score in the TT group (6.0 [4.0–7.0]) and highest for the BT group (8.0 [6.0–9.0]). A higher score, means better self-assessed disease control.

Psoriasis treatment during COVID-19 pandemic

Of the total of 227 treatment episodes with an ST during the COVID-19 pandemic, 16.3% was interrupted and 14.1% was completely discontinued (Table 3). In 10.1%, the change in treatment was because of patients' fear for COVID-19. Most of the time the

treating physician and patient together decided to interrupt or discontinue the treatment (42.0%). In 23.2% of the time, it was the patient who took the initiative to interrupt or discontinue their treatment.

Of the total study population, 226 patients received one or more types of biologics during the COVID-19 pandemic. In total, there were 264 biological treatment episodes (Table 4). Of these, 12.9% was interrupted and 10.6% was completely discontinued. The change in treatment was in 18.4% of the cases because patients experienced fear of getting COVID-19. Most of the time it was the treating physician, or the physician and patient together that decided to interrupt or discontinue the treatment (38.7% and 33.9% respectively). In 25.8% of the time the patient took the initiative to interrupt or discontinue their treatment.

Self-assessed disease control was graded a 6 or higher by 75.1% of patients that received F2F consultation, in comparison to 67.8% of patients that received remote care (Table 5).

Table 2. Access to information on COVID-19 and change in care during COVID pandemic.

	All patients (n=551)	Patients with topical treatment (n=147)	Patients with conventional systemics (n=178)	Patients with biologics (n=226)
Access to information about COVID-19 and psoriasis treatment, n (%)				
<i>Multiple answers possible</i>				
Provided by caregiver	303 (54.9)	49 (33.3)	101 (56.7)	153 (67.7)
(Telephonic) consultation with doctor/practitioner	153 (27.8)	23 (15.6)	51 (28.7)	79 (35.0)
Grade experience 0 – 10, median [IQR]	8.0 [7.0–10.0]	8.0 [7.0–8.5]	9.0 [8.0 – 10]	8.0 [7.0 – 10]
<i>Missing grades</i>	7 (1.3)	4 (17.4)	2 (3.9)	1 (1.3)
Letter from doctor/practitioner	146 (26.5)	28 (19.0)	45 (25.3)	73 (32.3)
Grade experience 0 – 10, median [IQR]	8.0 [7.0–10.0]	8.0 [7.0–9.0]	9.0 [7.0 – 10]	8.5 [7.0 – 10]
<i>Missing grades</i>	8 (1.5)	1 (3.6)	1 (2.2)	6 (8.2)
Email from doctor/practitioner	46 (8.3)	2 (1.4)	22 (12.4)	22 (9.7)
Grade experience 0 – 10, median [IQR]	8.0 [7.0–9.0]	6.5 [6.0–7.0]	8.0 [7.0–9.0]	8.0 [7.0–9.0]
<i>Missing grades</i>	1 (0.2)	0 (0.0)	0 (0.0)	1 (4.5)
Searched by patient				
Searched on the internet	90 (16.3)	15 (10.2)	24 (13.5)	51 (22.6)
Grade experience 0 – 10, median [IQR]	5.0 [4.0–7.0]	5.0 [4.0–7.5]	5.0 [2.0–7.0]	6.0 [4.0–7.5]
<i>Missing grades</i>	4 (0.7)	0 (0.0)	4 (16.7)	0 (0.0)
Not searched for information				
<i>Missing answers</i>	185 (33.6)	84 (57.1)	60 (33.7)	41 (18.1)
<i>Missing answers</i>	11 (2.0)	3 (2.0)	0 (0.0)	8 (3.5)
F2F care at department of dermatology, n (%)				
<i>Multiple answers possible</i>				
Like usual (before COVID-19)	272 (49.4)	79 (53.7)	75 (42.1)	118 (52.2)
(Partly) changed to remote appointments	240 (43.6)	40 (27.2)	97 (54.5)	103 (45.6)
By chat or email	5 (2.1)	2 (5.0)	0 (0)	3 (2.9)
Grade experience 0 – 10, median [IQR]	9.0 [-]	8.5 [8.0–9.0]		9.0 [9.0–9.5]
<i>Missing grades</i>	0 (0.0)	0 (0.0)		0 (0.0)
By telephonic consultation	225 (93.8)	32 (80.0)	92 (94.8)	101 (98.1)
Grade experience 0 – 10, median [IQR]	8.0 [7.0–10.0]	8.0 [7.0–9.0]	8.0 [7.0–9.0]	8.0 [7.5 – 10]
<i>Missing grades</i>	13 (2.4)	1 (3.1)	7 (7.6)	5 (5.0)
By virtual consultation	21 (8.8)	9 (22.5)	7 (7.2)	5 (4.9)
Grade experience 0 – 10, median [IQR]	9.0 [8.0–10.0]	8.0 [8.0–9.0]	10 [8.5 – 10]	9.0 [8.0 – 10]
<i>Missing grades</i>	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Delayed or discontinued	47 (8.5)	30 (20.4)	11 (6.2)	6 (2.7)
<i>Missing answers</i>	9 (1.6)	4 (2.7)	0 (0.0)	5 (2.2)
Change in usual F2F care (remote appointments/delayed/discontinued), n (%)				
Total number of patients with change in usual care	287 (52.1)	70	108	109
On own initiative due to COVID-19	21 (7.3)	7 (10.0)	7 (6.5)	7 (6.4)
On initiative of doctor/practitioner due to COVID-19	156 (54.4)	28 (40.0)	69 (63.9)	59 (54.1)
By choice of both due to COVID-19	61 (21.3)	11 (15.7)	20 (18.5)	30 (27.5)
Other reason besides COVID-19	25 (8.7)	16 (22.9)	5 (4.6)	4 (3.7)
<i>Missing answers</i>	24 (8.4)	8 (11.4)	7 (6.5)	9 (8.3)
Patient reported satisfaction with dermatological care during COVID-19 period				
Grade experience 0 – 10, median [IQR]	8.0 [8.0–10.0]	8.0 [7.0–9.0]	9.0 [8.0 – 10]	9.0 [8.0 – 10]
<i>Missing grades</i>	9 (1.6)	4 (2.7)	0 (0.0)	5 (2.2)
Self-assessed disease control during COVID-19 period				
Grade experience 0 – 10, median [IQR]	7.0 [5.0–8.0]	6.0 [4.0–7.0]	7.0 [6.0–8.0]	8.0 [6.0–9.0]
<i>Missing grades</i>	9 (1.6)	3 (2.0)	1 (0.6)	5 (2.2)

Table 3. Change in systemic treatment (ST) during COVID-19 pandemic, split for type of treatment.

	Methotrexate N=136	Fumaric Acid N=75	Cyclosporin N=8	Acitretin N=7	Apremilast N=1	Total N=227
Number of TEs with change in treatment pattern during COVID pandemic, n (%)*	43 (31.6)	18 (24.0)	3 (37.5)	4 (57.1)	1 (100.0)	69 (30.4)
Type of change, n (%)						
Interruption	24 (17.6)	9 (12.0)	0 (0.0)	3 (42.9)	1 (100.0)	37 (16.3)
Complete discontinuation	19 (14.0)	9 (12.0)	3 (37.5)	1 (14.3)	0 (0.0)	32 (14.1)
Change in treatment pattern due to patient COVID anxiety, n (%)	3 (7.0)	3 (16.7)	0 (0.0)	0 (0.0)	1 (100.0)	7 (10.1)
Initiator of change in treatment, n (%)*						
Treating physician	14 (32.6)	5 (27.8)	2 (66.7)	2 (50.0)	0 (0.0)	23 (33.3)
Patient	9 (20.9)	6 (33.3)	0 (0.0)	0 (0.0)	1 (100.0)	16 (23.2)
Treating physician and patient	19 (44.1)	7 (38.9)	1 (33.3)	2 (50.0)	0 (0.0)	29 (42.0)

Abbreviations: TE treatment episode.

*Missings treatment patterns: Methotrexate 2; Missing initiator of change: Methotrexate 1.

Table 4. Change in biological treatment (BT) during COVID-19 pandemic, split for biological type.

	ETA N=20	ADA N=66	INF N=1	UST N=71	SEC N=26	IXE N=44	RIS N=3	BRO N=21	GUS N=8	TIL N=2	CER N=2	Total N=264
Number of TEs with change in treatment pattern during COVID pandemic, n (%)*	6 (30.0)	20 (30.3)	0 (0.0)	7 (9.8)	5 (19.2)	18 (40.9)	0 (0.0)	3 (14.3)	1 (12.5)	1 (50.0)	1 (50.0)	62 (23.5)
Type of change, n (%)												
Interruption	5 (27.8)	17 (25.8)	0 (0.0)	2 (2.9)	1 (3.8)	5 (11.4)	0 (0.0)	2 (9.5)	1 (12.5)	0 (0.0)	1 (50.0)	34 (12.9)
Complete discontinuation	1 (5.6)	3 (4.5)	0 (0.0)	5 (7.1)	4 (15.4)	13 (29.5)	0 (0.0)	1 (4.8)	0 (0.0)	1 (50.0)	0 (0.0)	28 (10.6)
Change in treatment pattern due to patient COVID anxiety, n (%)	1 (16.7)	8 (40.0)	0 (0.0)	1 (14.3)	1 (20.0)	1 (2.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	12 (18.4)
Initiator of change in treatment, n (%)*												
Treating physician	2 (33.3)	5 (25.0)	0 (0.0)	1 (14.3)	2 (40.0)	11 (6.5)	0 (0.0)	1 (33.3)	1 (100.0)	0 (0.0)	1 (100.0)	24 (38.7)
Patient	3 (50.0)	8 (40.0)	0 (0.0)	3 (42.9)	0 (0.0)	2 (11.8)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	16 (25.8)
Treating physician and patient	1 (16.7)	7 (35.0)	0 (0.0)	3 (42.9)	3 (60.0)	4 (23.5)	0 (0.0)	2 (66.7)	0 (0.0)	1 (100.0)	0 (0.0)	21 (33.9)

Abbreviations: ETA etanercept; ADA adalimumab; INF infliximab; UST ustekinumab; SEC secukinumab; IXE ixekizumab; RIS risankizumab; BRO brodalumab; GUS guselkumab; TIL tildrakizumab; CER certolizumab; TE treatment episode.

*Missings treatment pattern: ETA 2, UST 1; Missings initiator of change: IXE 1.

Table 5. Reported disease activity during COVID pandemic on a scale of 0–10 (0 indicating very bad disease control, 10 indicating a very good disease control) according to type of care (F2F vs remote).

Reported disease activity during COVID-19 period >5, n (%) ^A	F2F care at department of dermatology like usual (before COVID), n (%)	F2F care at department of dermatology changed to remote appointments, delayed or discontinued, n (%)
193 (75.1)	192 (67.8)	

^AMissing score: 9.

Discussion

During the COVID-19 pandemic changes have taken place regarding the care for patients with psoriasis. In this study, 49.4% of the patients received their care like usual (before COVID-19) and for 43.6% of the patients' care was (partly) changed to remote care. Overall patients were satisfied with the different types of remote care. This change of care was mainly initiated by the caregiver, or caregiver and patient together. Self-assessed disease control between the treatment groups varied, with the TT group scoring the lowest (less disease control) in comparison with the other treatment groups (ST and BT). Interestingly, the relatively low self-reported disease control in the TT group did not result in a lower satisfaction with the received care for which the 3 groups scored evenly with a median score of 8.0. Of the conventional systemic treatments (ST), 16.3% was temporarily and 14.1% completely discontinued. Of the biologic treatments, 12.9% was temporarily and 10.6% completely discontinued. Fear for COVID-19 of the patient was in 10.1% a reason in the ST group and 18.4% in the BT group to change treatment (interruption of complete discontinuation). This suggests that the fear for COVID-19 did not seem to be the main reason for patients to interrupt of completely discontinue their treatment. No noticeable differences when comparing self-reported disease control between patients receiving regular F2F consultation with those receiving remote consultation were observed, suggesting that the consultation method did not impact disease control.

Patients were informed about COVID-19 and psoriasis in multiple ways. It was noticed that most patients were satisfied with the way they received information regarding COVID-19 and their treatment. The TT group seemed the least in need of extra information, as 57.1% did not search for information at all. Searching for information themselves on the internet received low grades by patients in all treatment groups. In the event of a new lockdown or pandemic, we should actively reach out to patients and provide them with more information rather than letting patients search for information on the internet themselves. Eventually, this could result in a better experience for the patient and could also limit the risk of information from less trustworthy sources.

Remote care was mainly done by telephonic consultation and the experience was graded very good (8.0). Other studies showed similar experiences toward telephonic consultation (9,10). Consultation by chat or email was not performed extensively but still did score high with a 9.0. Virtual consultations were done in 8.8% of remote care and mainly in the TT group and scored an overall 9.0 for all treatment modalities. This suggest that virtual consultations, or chat/email could be a good way of consultation when it comes to patient satisfaction, but we need to keep in mind that numbers were low in this study. A systematic review suggested to obtain more details about satisfaction and preferences between the different types of remote care. This could lead

to a better identification and improve the existing gaps in preferences (11).

An interesting finding in this study was that even though 43.6% of patients changed to remote consultation, the satisfaction of dermatologic care was scored an 8.0 and evenly spread over the treatment groups. This means that patients, even though consultation was not F2F, were still satisfied with the care they received. Another survey-based study in the dermatological field on patient perceptions and satisfaction (12) showed that patients were positive about telehealth because of time efficiency, no need for transportation and maintaining social distancing and only a few patients were unlikely to undertake remote consultation again. These factors could also have been a positive attribution in our patient population.

Interruption or complete discontinuation of a systemic treatment occurred in 30.3% (69/227) of the cases. Of the biologic treatments, 23.5% (62/264) was temporarily or completely discontinued. This was for both type of treatments mainly decided by the treating physician or physician and patient together. Interestingly, in the ST group the medication was changed 10.1% of the time due to fear of COVID-19 of patients and in 18.4% of the time the case in the BT group. This is an important finding and is of course related to many factors. Now, recent studies have shown that these patients (who have received the previous mentioned ST) do not have a higher risk of getting COVID-19 or have worse outcome (8) other ST have not been taken into account. The critical phase of COVID-19 is behind us, but information on the types of consultation and treatment choices that were made provides us with important learning insights. Patients had an overall positive experience and the amount of disease control in the remote appointment group was stable. This shows that implementing remote consultation can be a very positive new development and is something that we need to further investigate.

A limitation of this study is potential responder bias, as only a fourth of patients responded to our survey invitation. It is unknown if the nonresponders have different characteristics and potentially could have influenced our results. Furthermore, many questions where multiple-choice options which may lead to missing certain nuances or additional information. For instance, reasons why patients were satisfied with the remote care or what aspects were missing. Also, a limitation was the interpretation of disease control; patients self-assessed their disease control without any feedback or interpretation of the treating physician.

Conclusion

The present study, the implications of the COVID-19 pandemic on the care for patients with psoriasis was investigated by a cross-sectional survey sent to patients.

Access to information provided by treating physicians may be enhanced as only half of the patients received direct information from their treating physicians. Although considerable numbers of consultations took place through remote care, patients with psoriasis were generally satisfied about the access to care during the COVID-19 pandemic. Another positive finding was that self-assessed disease control overall had a positive outcome even for remote care, with only slight variations between the treatment groups. Only in a minority of patients, treatment was interrupted or completely discontinued. Taken all these findings together, it is reassuring that remote care seems to be a good alternative for F2F consultations, especially during unexpected events necessitating a shift from F2F consultations to remote care.

Disclosure statement

C. Wortman has carried out clinical trials for AbbVie, Almirall, Eli Lilly, Incyte, Leo Pharma and Novartis. All funding is not personal, but goes to the independent research fund of the department of dermatology of Bravis hospital, Bergen op Zoom, the Netherlands.

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K.V. Kwee has received a speaking fee from Eli Lilly and has carried out clinical trials for AbbVie, Novartis, Leo Pharma, Eli Lilly and Cellgene. All funding is not personal, but goes to the independent research fund of the department of dermatology of Bravis Hospital, Bergen op Zoom, the Netherlands

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J M.P.A. van den Reek carried out clinical trials for AbbVie, Celgene and Janssen and has received speaking fees/attended advisory boards from AbbVie, Janssen, BMS, Almirall, LEO Pharma, Novartis, UCB and Eli Lilly and reimbursement for attending a symposium from Janssen, Pfizer, Celgene and AbbVie. All funding is not personal but goes to the independent research fund of the department of dermatology of Radboudumc Nijmegen, the Netherlands.

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References

1. Ruggiero A, Martora F, Fabbrocini G, et al. The role of teledermatology during the COVID-19 pandemic: a narrative review. *Clin Cosmet Investiga Dermatol*. 2022;15:1–8. doi:10.2147/CCID.S377029.
2. Czintner D, Jobbágy A, Meznerics F, et al. Teledermatology services for elderly people during COVID-19 pandemic. *Eur Geriatric Med*. 2020;11(suppl 1):100.
3. Daniel ML, Julia CM, Sebastian M, et al. High impact of a national psoriasis telementoring clinic on medical practices for patients in underserved areas. *Dermatol Ther*. 2021;34(1):e14575. doi:10.1111/dth.14575.
4. Lee CH, Huang CC, Huang JT, et al. Live-interactive teledermatology program in Taiwan: one-year experience serving a district hospital in rural Taitung County. *J Formos Med Assoc*. 2021;120(1 Pt 2):422–428. doi:10.1016/j.jfma.2020.06.007.
5. Roca S, Almenara M, Gilaberte Y, et al. When virtual assistants meet teledermatology: validation of a virtual assistant to improve the quality of life of psoriatic patients. *Int J Environ Res Public Health*. 2022;19(21):14527. doi:10.3390/ijerph192114527.
6. Armstrong AW, Chambers CJ, Maverakis E, et al. Effectiveness of online vs in-person care for adults with psoriasis: a randomized clinical trial. *JAMA Netw Open*. 2018;1(6):e183062. doi:10.1001/jamanetworkopen.2018.3062.
7. Li Z, Xu H, Chen J, et al. Internet-based remote consultation facilitates the medical care of patients with chronic skin diseases during COVID-19 pandemic. *J Infect*. 2021;82(2):e31–e32. doi:10.1016/j.jinf.2020.08.025.
8. Kwee K. V, Murk JL, Yin Q, et al. Prevalence, risk and severity of SARS-CoV-2 infections in psoriasis patients receiving conventional systemic, biologic or topical treatment during the COVID-19 pandemic: a cross-sectional cohort study (PsoCOVID). *J Dermatolog Treat*. 2023;34(1):2161297. doi:10.1080/09546634.2022.2161297.
9. Agius E, Fleming C, Smith C. Clinical utility of virtual patient follow-up in a tertiary psoriasis service. *Br J Dermatol*. 2014;171:17.
10. Frühauf J, Schwantzer G, Ambros-Rudolph CM, et al. Pilot study on the acceptance of mobile teledermatology for the home monitoring of high-need patients with psoriasis. *Australas J Dermatol*. 2012;53(1):41–46. doi:10.1111/j.1440-0960.2011.00852.x.
11. Haderl E, Gitlow H, Nouri K. Definitions, survey methods, and findings of patient satisfaction studies in teledermatology: a systematic review. *Arch Dermatol Res*. 2021;313(4):205–215. doi:10.1007/s00403-020-02110-0.
12. Yeroushalmi S, Millan SH, Nelson K, et al. Patient perceptions and satisfaction with teledermatology during the COVID-19 pandemic: a survey-based study. *J Drugs Dermatol*. 2021;20(2):178–183. doi:10.36849/JDD.2021.5714.