Original Article

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Psoriasis 2.0: Facebook as a source of disease-related information for patients with psoriasis

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Summary

Background and objectives: The Internet is a commonly used source of health-related information. Social media allow psoriasis patients to seek and share information about their disease. However, they also involve risks such as misinformation and envy. The aim of this study was to explore the relevance and suitability of Facebook as a source of disease-related information for patients with psoriasis.

Patients and methods: Cross-sectional study consisting of an online survey (11/2017–01/2018). The link was published on a German information website focused on psoriasis. We also collected data about the respondents' general and disease-related Facebook habits as well as their assessment of opportunities and risks of Facebook in the context of psoriasis.

Results: 101 participants with psoriasis completed the questionnaire. Of these, 75 % reported using Facebook at least once a month, and 72 % of Facebook users stated that they had searched for disease-related information on Facebook. Active members of psoriasis-related Facebook groups deemed Facebook more helpful for coping with psoriasis. 60 % of Facebook users reported unreliable information and 57 % reported sales promotions regarding psoriasis when using Facebook.

Conclusions: We found that Facebook is a relevant source of information for psoriasis patients. However, the quality of information offered seems insufficient and needs to be improved.

Introduction

Psoriasis is a dermatologic disease which can have a large impact on physical and mental well-being, especially in severely affected patients [1–3]. Although numerous treatment options are available [4–6], only a proportion of patients receive adequate treatment [7–9]. As approximately 80 % of the EU population use the Internet and almost 60 % search for health-related information online [10], it is likely that the Internet is an important source of disease-related information for a large percentage of psoriasis patients, as well as for those who are not receiving medical treatment. Previous research has shown that the general population commonly uses search engines as tools for obtaining health-related information [11–13]. However, studies exploring the use of social media platforms as sources of health-related information are scarce.

Facebook is the largest social media platform in Germany and worldwide [14, 15]. In Germany, Facebook has more than 32 million active users, which corresponds to almost 40 % of the German population [16]. Once a medium for mere communication between friends, Facebook has become an all-around platform offering information, communication, and entertainment. The high number of users and possibility of interactions with and between users have made Facebook an attractive health care tool [17]. Patients can not only obtain disease-related information, but also connect with other affected people to share experiences, which may help them to cope with diseases. Previous research in the fields of psychology and media science has found that the use of Facebook can increase or reduce subjective well-being [18]. On one hand, connecting and interacting with other users can provide social support, which has been shown to positively impact subjective well-being [19]. For patients with

psoriasis, who are often stigmatized owing to the high visibility of the disease [3, 20], the social support of and exchange with other affected people on Facebook might be especially beneficial. On the other hand, the abundance of social information can trigger social comparison processes that can be overwhelming and – owing to mostly positive self-presentation on Facebook – can cause a negative sensation called "Facebook envy" [21]. Several studies have shown that Facebook envy, just like "regular" envy, has a negative impact on well-being [18, 21, 22]. For patients with psoriasis, social comparison processes might be especially stressful because self-esteem might already be low due to stigmatization [23]. In addition, Facebook content is not monitored in terms of veracity, allowing misinformation to spread easily. A review of psoriasis-related YouTube videos revealed a significant amount of low quality content and only a minor presence of medical institutions on the platform [24]. This finding may indicate a lack of high quality content about psoriasis on social media channels in general.

The aim of this study was to investigate the relevance and suitability of Facebook as a source of disease-related information for psoriasis patients. To do so, we first determined whether Facebook is a commonly used source of disease-related information for psoriasis patients and which patients are more likely to search for disease-related information on Facebook. Secondly, we assessed opportunities and risks of disease-related Facebook use and explored possible associations between Facebook use and the subjective well-being of patients with psoriasis.

Material and methods

For this cross-sectional study, an online survey was conducted from November 10 2017 to January 17 2018. Only individuals who reported having been diagnosed with psoriasis by a medical doctor were eligible to participate. During the survey period, the link to the questionnaire and a short report about the study were published on one of the most prominent German websites with information about psoriasis, led by a non-profit organization (www.psoriasis-netz.de). In addition, the link to the questionnaire was shared in the affiliated email newsletter and was posted in the affiliated online forum. Informed consent was obtained from all participants. This study was conducted in accordance with the Declaration of Helsinki and was approved by the local ethics committee of the Technical University of Munich (reference 417/17 S).

Questionnaire

As no standardized questionnaire exploring this topic was available, this study's questionnaire was developed by a team of medical researchers (one with a background in communication science) and a dermatologist. The questionnaire was pre-tested by the operator of the psoriasis website, who is affected by psoriasis herself. The questionnaire was further enhanced based on the feedback.

To measure *participants' characteristics*, we assessed their age, sex, education (high school graduate vs. non-high school graduate), and dermatology-specific Quality of Life (DLQI) [25] (with a higher DLQI score indicating higher skin-related impairment). To measure *general Facebook use*, we measured the frequency and duration of Facebook use (Table 1).

For participants who reported using Facebook less frequently than once a month, all further questions regarding Facebook were omitted. All other participants continued with questions on *disease-related Facebook habits* and *opportunities* and *risks of disease-related Facebook use*. The questions and possible answers are displayed in Table 2.

Facebook envy was measured using a scale by Krasnova et al. (Cronbach's $\alpha = 0.83$) [18]. The scale consists of six items (e.g. "It is somewhat annoying to see on Facebook how successful some of my Facebook friends are") that are averaged into an index, with 1 indicating a minimal level and 7 a maximum level of Facebook envy. *Happiness* was measured using an item from the European Social Survey [26] ("Taking all things together, how happy would you say you are?", 10-point scale from "extremely unhappy" to "extremely happy"). As indicators of *subjective well-being*, satisfaction with life was measured using the Satisfaction With Life Scale [27] (possible scores ranging from 5 "extremely unsatisfied" to 35 "extremely satisfied", Cronbach's $\alpha = 0.89$). Positive and negative affect were assessed using the Scale of Positive and Negative Experience [28] (Cronbach's $\alpha = 0.93$ for positive affect; Cronbach's $\alpha = 0.81$ for negative affect). Possible scores for positive and negative affect ranged from 6 (lowest positive/negative affect score) to 30 (highest positive/negative affect score).

Statistics

For descriptive evaluation, all participants who reported searching for disease-related information on Facebook more frequently than "never" were considered to use Facebook as a source of disease-related information, and answers to items measured on a scale from 1 ("I don't agree at all") to 7 ("I agree completely") were categorized as follows: 1–3 = disagreement, 4 = neither agreement nor disagreement, and 5–7 = agreement. For descriptive analysis only, age was classified as follows: 34 years and younger, 35–49 years, 50–59 years and 60 years and older. For the rest of the analyses, age was analyzed as a metric variable measured in years. For the analysis of associations between the variables, the following variables were dichotomized:

Table 1 Participants' characteristics and general Facebook habits.

Sex	Men	n = 28 (28 %)
	Women	n = 73 (72 %)
Age	Mean 47.43 ±15.44, range 20–77	
	34 years old and younger	n = 23 (23 %)
	35–49 years old	n = 16 (16 %)
	50–59 years old	n = 37 (37 %)
	60 years old and older	n = 25 (25 %)
Education	Not a high school graduate	n = 52 (51 %)
	High school graduate	n = 49 (49 %)
DLQI[25]	Mean 11.98 ±7.34, range 0–28	
	No effect at all on patient's life	n = 6 (6 %)
	Small effect on patient's life	n = 17 (17 %)
	Moderate effect on patient's life	n = 25 (25 %)
	Very large effect on patient's life	n = 39 (39 %)
	Extremely large effect on patient's life	n = 14 (14 %)
Frequency of Facebook use	Never or less than once per month	n = 25 (25 %)
	At least once per month	n = 5 (5 %)
	At least once per week	n = 12 (12 %)
	Daily	n = 25 (25 %)
	Several times daily	n = 34 (34 %)
Duration of Facebook use (average per day)[a]	Less than 5 min	n = 4 (5 %)
	5–30 min	n = 43 (57 %)
	30–60 min	n = 18 (24 %)
	More than 60 min	n = 11 (14 %)

N = 101. [a]Only participants who reported using Facebook at least once per month answered this question (n = 76).

frequency of general Facebook use (several times per day/less than several times per day; only when examined as independent variable), membership in a psoriasis-related Facebook group (yes/no), feeling confronted by untrustworthy information (yes/no) and feeling confronted by manipulative advertisements (yes/no).

All variables were analyzed descriptively and associations between the variables were explored in three steps (Table 3). *(1)* In the first step of the analysis, associations between *participants characteristics* (age, sex, education and DLQI) and the following outcomes were explored: *(a) general Facebook use* (frequency and duration; ordinal logistic regression), *(b)* frequency of searching for disease-related information (linear regression) *(c)*, engagement with disease-related Facebook content (posting of disease-related content and memberships in psoriasis-related Facebook groups; binary logistic regression), *(d)* Facebook Envy (linear regression). *(2)* In the second step of the analysis, *frequency of general Facebook use* and *disease-related Facebook habits* (searching for information, posting of disease-related content and group membership) were explored as possible predictors for *(a) benefits* (perceived helpfulness for dealing with the disease and getting in contact with other patients; linear regression) and *(b) risks of disease-related Facebook use* (untrustworthy information, manipulative advertisements and perceived pressure to hide skin disease; binary logistic and linear regression). *(3)* In the third step, linear regression was used to assess *disease-related Facebook habits* and *Facebook envy* as possible predictors of *(a) subjective well-being* (positive affect, negative affect and satisfaction with life) and *(b) happiness*. Due to intercorrelations between the variables, each possible predictor was explored in a separate model with only age and sex as covariates, except participants' characteristics, which were analyzed as a group. As a consequence, for steps 2 and 3, age- and sex-adjusted standardized coefficients (β) and odds ratios (ORs) are reported. In addition to these analyses, Facebook users and non-users were compared in terms of subjective well-being and happiness using Student's t-test. For all conducted analyses, the level of significance was set at $\alpha = 0.05$. Data management and statistical analyses were conducted using IBM SPSS Statistics 24 (IBM Corporation, Armonk, NY, USA).

Table 2 Items and response options used to measure disease-related Facebook habits.

	Items	Response options	Results[a]
Disease-related Facebook habits			
Disease-related information on Facebook	On Facebook, how often do you search for information regarding skin diseases (by searching for relevant accounts, groups etc.)?	7-point scale: 1 = never 7 = several times per day	Mean 3.07 ± 1.72 range 1–7
	On Facebook there are a lot of options to get information about skin diseases.	7-point scale: 1 = I don't agree at all 7 = I agree completely	Mean 2.96 ± 1.73 range 1–7
	I wish there were more options to get information about skin diseases on Facebook.		Mean 3.36 ± 2.19 range 1–7
Engagement with disease-related content	Have you ever posted content related to skin diseases on Facebook?	Yes[b] No	n = 24 (32 %) n = 52 (68 %)
	Are you a member of a (public or private) psoriasis-related Facebook group?	Yes, I'm an active member[c] Yes, I'm a passive member[d] No	n = 12 (16 %) n = 12 (16 %) n = 52 (68 %)
Benefits and risks of Facebook			
Benefits of disease-related Facebook use	Facebook helps me to deal with my skin disease. Facebook helps me connect with other affected people.	7-point scale: 1 = I don't agree at all 7 = I agree completely	Mean 2.21 ± 1.72 range 1–7 Mean 2.54 ± 1.89 range 1–7
Risks of disease-related Facebook use	Do you sometimes feel confronted by incorrect or dubious information regarding your skin disease when on Facebook?	Yes, frequently Yes, occasionally Yes, rarely No	n = 4 (5 %) n = 21 (21 %) n = 19 (25 %) n = 31 (41 %)
	Do you sometimes feel pressured to buy certain products for the treatment of your skin disease when on Facebook?	Yes, frequently Yes, occasionally Yes, rarely No	n = 8 (12 %) n = 21 (28 %) n = 14 (19 %) n = 32 (43 %)
	Due to the beautiful pictures that my Facebook friends share on Facebook, I feel pressured to hide my skin disease (on Facebook images or in real life).	7-point scale: 1 = I don't agree at all 7 = I agree completely	Mean 2.28 ± 1.80 range 1–7

[a]Only Facebook users answered these questions, n = 76.
[b]Participants were also asked to indicate which kind of content they had posted (psoriasis-related text, links to psoriasis-related websites, photos/videos with information about psoriasis, photos of oneself showing the skin disease). To keep this table clear, the detailed results are only described in the text.
[c]Explanation (also in questionnaire): at least occasional posting of content in the group and/or reacting to or commenting on other posts and/or comments.
[d]Explanation (also in questionnaire): reading the posts and comments in the group, but not actively taking part in the discussion.

Table 3 Analysis of associations between the examined variables in three steps. Dependent and independent variables in each step of the analysis and resulting odds ratios (ORs), standardized coefficients (β) and corresponding 95 % confidence intervals (CIs) are displayed.

STEP 1[a]				
Independent Variables →	**Age**	**Sex (female)**	**Education (high)**	**DLQI**
↓ Dependent variables				
1a) General Facebook use	**0.91**	1.40	**0.22**	0.97
– frequency* (OR [CI])	**[0.88; 0.94]**	[0.59; 3.35]	**[0.09; 0.52]**	[0.92; 1.02]
– duration* (OR [CI])	**0.96**	0.85	0.37	**0.94**
	[0.93; 0.99]	[0.32; 2.28]	[0.13; 1.02]	**[0.88; 0.99]**
1b) Frequency of searching for disease-related information[†] (β [CI])	**0.31** **[0.07; 0.53]**	−0.07 [−0.26; 0.12]	**−0.24** **[−0.46; −0.03]**	**0.21** **[0.01; 0.41]**
1c) Engagement with disease-related Facebook content:				
– posted disease-related content before[‡] (OR [CI])	1.01 [0.97; 1.05]	2.15 [0.68; 6.83]	**0.21** **[0.06; 0.73]**	0.96 [0.89; 1.03]
– membership in disease-related Facebook group[‡] (OR [CI])	1.02 [0.98; 1.06]	1.56 [0.51; 4.81]	0.35 [0.11; 1.12]	1.01 [0.94; 1.08]
1d) Facebook Envy[†] (β [CI])	−0.08 [−0.34; 0.18]	0.13 [−0.10; 0.35]	0.13 [−0.12; 0.38]	0.04 [−0.19; 0.27]
STEP 2[b]				
Independent variables → **↓ Dependent variables**	**Frequency: general Facebook use (high)**	**Frequency: searching for disease-related information**	**Posted disease-related content before**	**Membership in disease-related Facebook group**
2a) Benefits of disease-related Facebook use				
– perceived helpfulness: dealing with the disease[†] (β [CI])	0.16 [−0.08; 0.40]	**0.56** **[0.35; 0.77]**	**0.48** **[0.28; 0.68]**	**0.47** **[0.26; 0.67]**
– perceived helpfulness: getting in contact with other patients[†] (β [CI])	0.19 [−0.04; 0.41]	**0.44** **[0.22; 0.65]**	**0.30** **[0.10; 0.51]**	**0.25** **[0.05; 0.46]**
2b) Risks of disease-related Facebook use				
– untrustworthy information[‡] (OR [CI])	1.01 [0.34; 3.00]	**1.61** **[1.13; 2.31]**	**3.61** **[1.08; 12.00]**	**7.59** **[1.90; 30.41]**
– manipulative advertisements[‡] (OR [CI])	0.78 [0.27; 2.24]	**1.46** **[1.04; 2.04]**	0.77 [0.27; 2.23]	1.79 [0.60; 5.34]
– perceived pressure to hide skin disease† (β [CI])	−0.09 [−0.34; 0.15]	**0.27** *[0.23; 0.51]*	−0.15 [−0.38; 0.09]	0.08 [−0.15; 0.31]
2c) Facebook envy[†] (β [CI])	−0.13 [−0.39; 0.12]	0.07 [−0.18; 0.32]	−0.06 [−0.29; 0.17]	−0.11 [−0.34; 0.12]

Continued

Table 3 Continued.

STEP 3[b]				
Independent variables → ↓ **Dependent variables**	**Facebook envy**	**Frequency: searching for disease-related information**	**Posted disease-related content before**	**Membership in disease-related Facebook group**
3a) Subjective well-being	0.51	0.05	0.19	0.06
– positive affect[†] (β [CI])	[−0.18; 0.28]	[−0.20; 0.30]	[−0.04; 0.41]	[−0.16; 0.29]
– negative affect[†] (β [CI])	−0.16	0.07	0.04	−0.01
– satisfaction with life[†] (β [CI])	[−0.39; 0.08]	[−0.19; 0.33]	[−0.20; 0.28]	[−0.26; 0.23]
	−0.38	−0.21	0.07	0.04
	[−0.58; −0.16]	[−0.45; 0.03]	[−0.16; 0.29]	[−0.18; 0.27]
3b) Happiness[†] (β [CI])	**−0.36**	−0.10	0.16	0.19
	[−0.57; −0.14]	[−0.35; 0.14]	[−0.07; 0.38]	[−0.03; 0.42]

[a]Step 1: All examined independent variables were entered in the same model, thus fully adjusted ORs, βs and CIs are reported.
[b]Step 2 and 3: due to intercorrelations, each independent variable was explored in a separate model with only age and sex as covariates, thus age- and sex-adjusted ORs, βs and 95 % CIs are reported.
*Ordinal logistic regression model, [†]linear regression model, [‡]binary logistic regression model.

Results

Participants' characteristics

During the two-month study period, the online questionnaire was accessed 342 times. 147 participants started the questionnaire and 106 completed it. Five participants were excluded prior to the analysis as they stated that they were not affected by psoriasis. Consequently, the data of 101 respondents were analyzed. Participants' mean age was 47.43 years ± 15.44 years, and 72 % of participants were women.

General Facebook use

In total, 76 study participants (75 %) reported using Facebook at least once a month and most Facebook users (57 %) reported spending between 5 and 30 minutes per day on Facebook (Table 1). Facebook use was more frequent in younger age groups, but 44 % of respondents 60 years of age and older reported using Facebook at least daily (Figure 1). Greater age and higher education (having graduated from high school) were associated with lower frequency of Facebook use (OR = 0.91, CI = [0.88; 0.94] and OR = 0.22, CI = [0.09; 0.52]), and higher age was associated with lower duration of Facebook

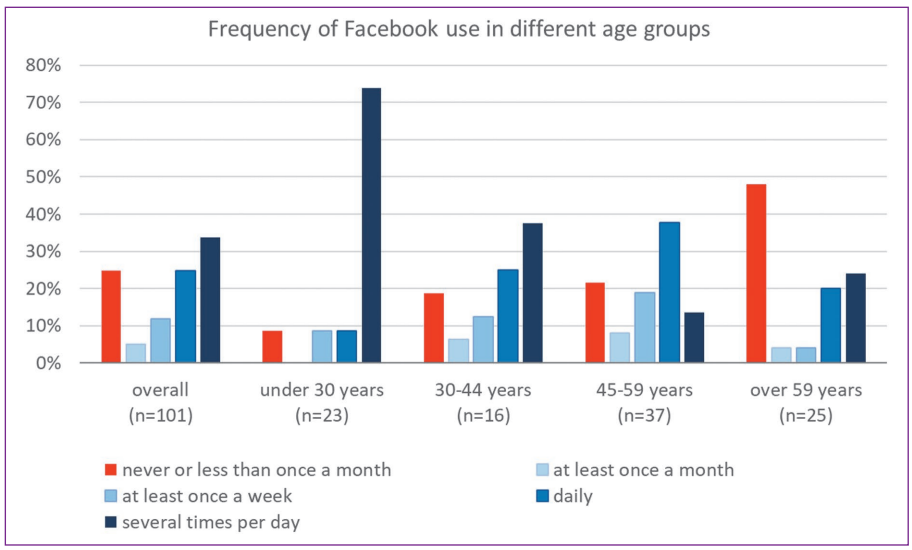

Figure 1 Frequency of Facebook use in different age groups (n = 101).

use (OR = 0.96, CI = [0.93; 0.99]) (Step 1a) (Table 3). Higher DLQI was associated with less time spent on Facebook (OR = 0.94, CI = [0.88; 0.99]), but not with the frequency of Facebook use. No association between gender and frequency or duration of Facebook use was found (Table 3).

Facebook as a source of disease-related information

Of the 76 Facebook users in this sample, 72 % reported using Facebook as a source of information about skin diseases. While only half (52 %) of Facebook users aged 30 or younger reported using information about psoriasis on Facebook, 92 % of Facebook users aged ≥ 60 years reported doing so (Figure 2). Greater age (β = 0.31, CI = [0.07; 0.53]) and higher DLQI (β = 0.21, CI = [0.01; 0.41]) were both associated with a higher frequency of searching for disease-related information on Facebook, while higher education was associated with less frequently doing so (β = -0.24, CI = [–0.46; –0.03]; Step 1b) (Table 3). Only 19 % of Facebook users agreed that Facebook offers a wide range of disease-related information and only a third (32 %) of Facebook users stated that they would be interested in more disease-related information on Facebook (Table 2).

Engagement with disease-related Facebook content

A third (32 %) of all Facebook users reported having posted skin disease-related content on Facebook (Table 2). They most frequently indicated that they had posted texts about psoriasis (n = 18) or had shared links to psoriasis-related websites (n = 11), while posting photos or videos with information about psoriasis (n = 5) or posting photos of oneself showing the skin disease (n = 4) were less common. There was no significant association between posting information about skin diseases and age, DLQI or sex, but posting psoriasis-related content was less common in users with higher education (OR = 0.21, CI = [0.06; 0.73]; Step 1c) (Table 3).

Almost one third of Facebook users reported being members of a psoriasis-related Facebook group (32 %). Of those, half reported being active members and half reported being passive members (Table 2). There were no associations between group membership and age, DLQI, education or sex (Step 1c) (Table 3).

Benefits of disease-related Facebook use

Twelve percent of Facebook users agreed that Facebook helped them to deal with their disease, while 15.8 % of Facebook users agreed that Facebook helped them to get in contact with other affected individuals. Higher frequency of searching for disease-related information on Facebook (β = 0.56, CI = [0.35; 0.77] and β = 0.044, CI = [0.22; 0.65]), as well as previously having posted information about psoriasis on Facebook (β = 0.48, CI = [0.28; 0.68] and β = 0.30, CI = [0.10; 0.51]) and being a member of a psoriasis-related Facebook group (β = 0.47, CI = [0.26; 0.67] and β = 0.25, CI = [0.05; 0.46]) were all associated with higher perceived helpfulness of Facebook for dealing with the disease and for getting in contact with other affected individuals, but higher frequency of general Facebook use was not (Step 2a) (Table 3).

Risks of disease-related Facebook use

In terms of risks of disease-related Facebook use, 60 % of Facebook users felt that they encountered unreliable information (19 % rarely, 21 % occasionally and 4 % frequently) about their disease and 57 % that they encountered manipulative advertisements about products or services related to their skin disease when on Facebook (14 % rarely, 21 % occasionally and 8 % frequently) (Table 2). Facebook users who reported more frequent searching for disease-related content (OR = 1.61, CI = [1.13; 2.31]), had previously posted

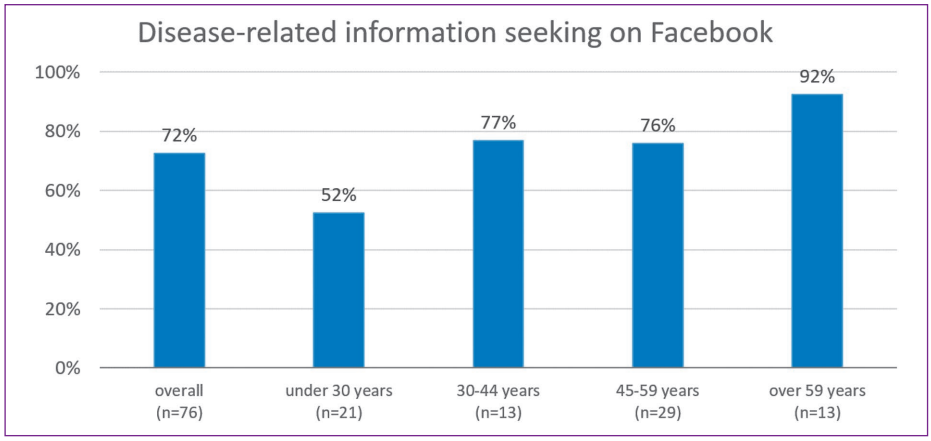

Figure 2 Percentage of participants who reported using Facebook as a source of disease-related information in different age groups (n = 76).

disease-related content (OR = 3.61, CI = [1.08; 12.00]) or were members of psoriasis-related Facebook groups (OR = 7.59, CI = [1.90; 0.67]) had a higher chance of feeling that they encountered untrustworthy information (step 2b) (Table 3). In contrast, only searching for disease-related information more frequently was associated with the perception of manipulative advertisements on Facebook (OR = 1.46, CI = [1.04; 2.04]).

Sixteen percent of Facebook users felt that they were pressured to hide their skin disease due to the pictures shared by their Facebook friends. Perceived pressure to hide the disease was not associated with general or disease-related Facebook use (step 2b) (Table 3).

Facebook envy

The mean score of Facebook envy was 2.59 ± 1.35. Neither participants' characteristics nor Facebook habits were associated with higher levels of Facebook envy (steps 1d and 2c) (Table 3).

Subjective well-being

The mean score for happiness was 6.79 ± 2.26, for satisfaction with life 4.31 ± 1.32, and for positive and negative affect 19.30 ± 2.02 and 18.56 ± 2.68, respectively. There were no significant differences between Facebook users and non-users in terms of happiness (p = 0.53), satisfaction with life (p = 0.73), and positive and negative affect (p = 0.82 and p = 0.67, respectively). Searching for disease-related information, having previously posted disease-related content and being a member of a psoriasis-related Facebook group were not associated with subjective well-being or happiness (steps 3a and 3b) (Table 3). Participants with higher levels of Facebook Envy reported lower satisfaction with life (β = −0.38, CI = [−0.58; −0.16]) and lower happiness (β = −0.36, CI = [−0.57; −0.14]), but no association with positive or negative effect was observed.

Discussion

To the best of our knowledge, this study is the first to explore the relevance and suitability of Facebook as a source of disease-related information for patients with psoriasis. We found that Facebook is a commonly used source of information for patients with psoriasis, particularly among older Facebook users. However, the disease-related information seems to be inadequate, as not even 25 % of Facebook users in this sample were satisfied with the amount of disease-related information offered on Facebook. Only one third of Facebook users expressed interest in a broader range of disease-related information offered on Facebook, which might indicate that most users are skeptical of information provided on Facebook. This seems to be especially true for younger and well-educated users.

The results of this study indicate that for patients with psoriasis, the overall risks of disease-related Facebook use, such as unreliable information and manipulative advertisements, seem to outweigh the benefits of coping with the disease. Nevertheless, 72 % of Facebook users reported using Facebook as a source of information, which demonstrates that in terms of Facebook content aimed at patients with psoriasis, there is a strong need for action and that the quality of the content needs to be improved. The results also suggest that using Facebook to share experiences with other affected people seems to be especially beneficial for psoriasis patients, as users who had previously posted psoriasis-related Facebook content and members of psoriasis-related Facebook groups regarded Facebook as more helpful for coping with the disease. Considering the above-mentioned results, which show that the quality of psoriasis-related Facebook content is not sufficient, offering a Facebook group which supports the exchange between affected individuals but which is monitored by healthcare professionals so that misinformation can be corrected and high-quality information provided seems like a promising way to increase the suitability of Facebook as a source of disease-related patients with psoriasis.

Although membership in Facebook groups and sharing psoriasis-related content was beneficial for coping with psoriasis, we did not observe a positive effect of sharing psoriasis-related content or active membership on subjective well-being. This is in contrast to the results of previous studies, which showed positive effects of sharing content and interacting with Facebook friends [18, 29, 30]. One explanation could be that a positive association only appears if the shared content represents a sufficient level of self-disclosure [29]. An alternative explanation is that these positive effects of self-disclosure and interaction on well-being simply do not exist in the context of skin diseases.

Consistent with previous findings [18, 21, 22], Facebook envy was negatively associated with subjective-well-being. However, we found no association between Facebook envy and general frequency of Facebook use. This raises the question of whether Facebook envy should be considered a dispositional personality trait rather than a consequence of Facebook use. According to our findings, patients with more severe forms of psoriasis are no more susceptible to Facebook envy than patients with milder forms of the disease. However, a comparison between patients with psoriasis and healthy individuals is necessary to verify an association between psoriasis and Facebook envy.

The results of this study are subject to several limitations. Firstly, it is a cross-sectional study, and therefore cannot determine causality but only association. Secondly, the

data collected in this study is self-reported, and thus social desirability and recall bias may have affected the results. Finally, the recruitment of participants from a psoriasis website (which also includes an online forum) might have resulted in a sample which is more inclined to search for disease-related information online and to "socialize" online. Consequently, both the number of Facebook users and participants who search for information on Facebook might be overestimated and the evaluation of Facebook more favorable in this sample. Thus, more studies with broader samples, larger sample sizes and alternative recruitment strategies are needed. However, the high proportion of participants who reported using Facebook as a source of disease-related information in this study shows that this is a relevant topic which needs further consideration in dermatologic and healthcare research.

In conclusion, this study is one of the first to examine social media as a source of information about psoriasis and a potential means of delivering healthcare services to patients. We found that Facebook is a relevant source of information for many patients with psoriasis that has mostly been neglected in health services research so far. While Facebook can be helpful for dealing with the disease, it also poses risks such as misinformation or manipulative information. Consequently, health care professionals should offer and promote more sources of validated information on Facebook. Furthermore, health services on Facebook should also target older Facebook users, as they are more inclined to use Facebook as a source of disease-related information. Future research should explore what patients expect from health-related online content (e.g. information, social support etc.) in order to better address these needs.

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