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INVESTIGATIVE REPORT

Skin Pain and Discomfort in Psoriasis: An Exploratory Study of Symptom Prevalence and Characteristics

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Few studies have investigated subjective sensory skin symptoms in patients with psoriasis. The aim of this study was to investigate prevalence and characteristics of psoriasis-related skin pain and discomfort, and evaluate differences in demographic/clinical characteristics among patients with or without skin symptoms. A total of 139 patients was recruited for this exploratory, descriptive, cross-sectional study. Data were obtained through interviews and questionnaires. While 42.6% reported skin pain, 36.7% reported skin discomfort. Mean average symptom intensity score (0–10 numeric rating scale) was 4.4 for pain and 3.5 for discomfort. Unpleasant, surface, sensitive, itchy, and hot/burning were the most common symptom qualities. Sleep was the most severely affected function. No differences were found in demographic characteristics. However, larger proportions of patients with skin symptoms had more severe psoriasis ($p < 0.05$). In conclusion, pain and discomfort are more common and more severe in patients with psoriasis than previously estimated. ***Key words: pain; discomfort; psoriasis; PASI.***

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While clinician-assessed physical signs have been the focus of most psoriasis research, there is increasing interest in the patients' experience of sensory symptoms. The progress and recognition of quality of life (QoL) and symptom management research (1), has led to the acceptance of patients' perception and self-report as the gold standard for studying symptoms. In fact, QoL studies (2–4) have shown that more than 90% of patients with psoriasis report physical skin symptoms.

Patients with psoriasis have been shown frequently to experience skin pain and skin discomfort (5, 6). Pain is a symptom defined as "an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage" (7). In a survey of skin disease in general practice 25% of patients with psoriasis reported pain (8). QoL studies (9–13) found that patients with psoriasis reported bodily pain scores comparable to those of patients with heart disease and diabetes (14). In addition, psoriasis patient who were female, older (12), or had less education, chronic co-morbidities (13), more severe psoriasis, and psoriasis of longer duration (9, 10, 12) reported more pain. Of note, none of these studies (8–13, 15, 16) determined whether the pain was specific to psoriasis or other medical conditions. Only two studies (5, 17) found that 26–32% of patients with psoriasis reported that their skin hurt "often or all the time". Patients who were female, older, with less education or had more severe psoriasis, were more likely to report that their skin hurt.

Discomfort is a term commonly used in dermatology research and clinical practice to address sensory skin symptoms. However, no consensus definition of discomfort exists. Previous psoriasis studies applied discomfort either as an umbrella term for skin sensations (i.e. pain; itch; prickling; burning; tingling; stinging; soreness) and signs (i.e. scaling; suppuration) (13, 18–21), as a symptom synonymous to (20), or distinct from pain (22, 23), or as mental/social distress (18, 24). QoL studies (6, 25, 26) showed that at least 23% of patients reported discomfort from their psoriasis. Of note, these studies did not investigate discomfort in relation to demographic or clinical characteristics.

Symptom characteristics such as intensity, qualities, and interference with function are dimensions of the total pain experience (27). Only a limited number of studies reported pain or discomfort characteristics in patients with psoriasis. Research (21, 28) showed that patients with psoriasis reported pain or discomfort intensity scores in the mild to moderate range. In addition, QoL studies (6, 25, 26) showed that 23% of patients reported at least moderate discomfort and 8% reported extreme discomfort from their psoriasis. Sensitivity, burning/stinging, irritation, and itching in the skin were reported by 39–64% of patients with psoriasis (5, 17). While the studies referred to these sensations as distinct symptoms, pain research considers these sensations as symptom qualities (27). In terms of symptom interference, one study (13) showed that psoriasis-specific physical symptoms (i.e. itch, pain, burning, scaling) were related to poor physical function. Other studies

suggested that psoriasis-related discomfort interfered with normal work (6, 25) and sexual life (21).

For a number of reasons, the prevalence and specific characteristics of skin pain and skin discomfort in patients with psoriasis cannot be estimated from existing dermatology research. First, the large studies on skin pain prevalence included hospitalized, older patients with moderate to severe psoriasis. Secondly, several studies (6, 25, 26, 28) did not specify whether pain or discomfort was caused by psoriasis skin lesions or psoriasis arthritis. Thirdly, discomfort characteristics were described for only a rare psoriasis subtype (21). Finally, concepts such as symptoms, qualities, and signs were used inconsistently (5, 17) or collapsed into one overall psoriasis symptom entity (13).

Based on the paucity of research, the purposes of this exploratory study were: (*i*) to describe the prevalence of skin pain or skin discomfort reported by patients with psoriasis; (*ii*) to determine whether patients with psoriasis with skin pain, skin discomfort, or no skin pain/discomfort differed in any demographic and clinical characteristics; and (*iii*) to explore symptom characteristics (i.e. intensity, qualities, interference with function) of psoriasis-related skin pain or skin discomfort.

METHODS

Sample and setting

Patients were recruited prior to a consultation at the inpatient and outpatient dermatology units at a university hospital in Oslo, Norway, between January and September 2006. Patients were included if they: had a psoriasis diagnosis; were ≥18 years of age; were able to read and write Norwegian; had Caucasian skin type; and could differentiate skin pain from other bodily pain. Patients were excluded if, at the time of recruitment, they had: clinical signs of infection in psoriasis plaques; concomitant skin diseases that caused pain/discomfort; no clinically visible psoriasis; psychiatric diagnosis or cognitive impairment that prohibited them from completing the self-report questionnaires; or had started hospital treatment (e.g. phototherapy, baths).

One of five research nurses approached the patients in the outpatient or inpatient units and explained the study purpose and procedures. Patients who agreed to participate provided written informed consent. The study was recommended by the Regional Committee for Medical Research Ethics, region south, and approved by the Norwegian Data Inspectorate.

A total of 269 adult patients with psoriasis were registered for consultation in the dermatology units during the study period. Thirty-one patients (11.5%) were not invited to participate in the study due to scheduling conflicts. Of the 238 patients approached, 4 did not meet the inclusion criteria for the following reasons: uncertain psoriasis diagnosis ($n=1$), non-Caucasian skin type ($n=2$), and Norwegian illiteracy ($n=1$). In addition, 42 patients were excluded due to: concomitant skin diseases ($n=16$), ongoing hospital treatment ($n=14$), no psoriasis plaques at the time of recruitment ($n=5$), psychological problems ($n=4$), and cognitive impairment ($n=3$). Of a total of 192 eligible patients, 140 (72.9%) agreed to participate. After enrolment, one patient was excluded due to a change in diagnosis. The final sample therefore included 139 patients.

Study procedures

For each patient, a 30–40 min interview was conducted by one investigator (TML). Patients were screened for skin pain and skin discomfort. Specific definitions of pain and discomfort were not provided, because this exploratory study aimed to investigate the patients' subjective experience of sensory skin symptoms without biasing their responses. During the interview, information was collected on demographic and clinical characteristics. A clinical evaluation of psoriasis severity was carried out and medical records were reviewed for disease and treatment information. Patients were shown how to complete the questionnaires (within 24 h) and return them in postage paid envelopes. The postal questionnaire response rate was 90.6%.

Instruments

Demographic characteristics. Information was collected on gender, age, ethnicity, marital status, living arrangements, education, and employment status.

Co-morbidity. Patients completed the Self-Administered Comorbidity Questionnaire (SCQ-18), which evaluated the number, severity, and functional impact of health problems (29). In this study, the SCQ contained 16 defined and 2 optional conditions (i.e. hypertension, diabetes, abdominal ulcer, headache, depression, osteoarthritis, rheumatoid arthritis, back/neck pain, cancer, musculoskeletal condition, and disease of the heart, lung, bowel, kidney, liver, blood). The total score range from 0 to 54. Higher scores indicate a more severe co-morbidity profile.

Prevalence of skin pain and skin discomfort. Two questions were used to screen patients into three skin symptom groups (i.e. pain, discomfort, no pain/discomfort). First, patients indicated, using a yes/no format, whether they had experienced any skin pain or skin discomfort during the past 24 h. Patients who responded yes indicated whether the sensation was pain or discomfort. Patients who reported both pain and discomfort ($n=3$) were categorized in the pain group.

Intensity of skin pain and skin discomfort. The Norwegian version of the Brief Pain Inventory (BPI) (30) was used to measure intensity of pain or discomfort on 0 (no symptom) to 10 (worst symptom imaginable) numeric rating scales (NRS). Four items address present, worst, least, and average pain or discomfort intensity over the past 24 h (30, 31). Suggested NRS cut-points for mild, moderate, and severe chronic non-malignant pain are 1–3, 4–6, and 7–10, respectively (32–35).

Qualities of skin pain and skin discomfort. The Pain Qualities Assessment Scale (PQAS) (36) was used to assess pain or discomfort qualities. For the purpose of this study, PQAS was translated from English to Norwegian using the Linguistic Validation method (37). This questionnaire includes 20 items that evaluate symptom intensity, quality, spatial characteristics, and temporal pattern over the past week. Each quality's severity is scored 0 (no/not [item]) to 10 (the most [item] sensation imaginable) on a NRS. These continuous variables were dichotomized into "not endorsed" (0) or "endorsed" (> 0) in order to determine the percentage of patients who endorsed particular symptom qualities.

Interference of skin pain and skin discomfort. The BPI (30) was used to evaluate interference of skin symptoms on a 0 (no interference) to 10 (worst interference imaginable) NRS. Seven items address symptom interference with daily activities, mood, walking ability, work, relations with other people, sleep, and enjoyment of life over the past 24 h (30, 31). Interference scores ≥4 indicate clinically significant interference with function in cancer patients (38, 39). The continuous variables of interference severity were dichotomized into "not endorsed" (0) or "endorsed" (> 0) in order to determine the percentage of patients who endorsed particular symptom interference items.

Clinical evaluation

Duration and severity of psoriasis. Psoriasis duration in years was obtained through patient interviews. Psoriasis severity was

determined using the Psoriasis Area and Severity Index (PASI). The PASI total score ranges from 0–72. Higher scores indicate greater psoriasis severity (40).

Overall psoriasis condition. Patients rated their overall condition of psoriasis as stable, improved, or exacerbated (41).

Medications and topical treatments for psoriasis. Information was collected on medication (i.e. non-prescription, prescription) and psoriasis treatment through patient interviews and from medical records. Treatments were collapsed into two groups (i.e. topical and/or phototherapy, *or* systemic alone or with topical- and/or phototherapy).

Statistical analysis

Data were analysed using the SPSS for Windows version 16.0 (SPSS, Inc., Chicago, US) and SPSS SamplePower 2.0. Descriptive statistics were generated on demographic, clinical, and symptom characteristics. Differences among the pain ($n=58$), discomfort ($n=51$), and no pain/discomfort ($n=30$) groups in categorical variables were examined with χ^2 and Fisher's exact test analyses. Differences among the three groups in continuous variables were examined with one-way analysis of variance (ANOVA) and Kruskal Wallis analyses. Nine pairwise contrasts were calculated to locate group differences in the categorical variable "overall psoriasis condition". The significance criterion for each of these contrasts was set at 0.006 (0.05/9). Three pairwise contrasts were calculated to locate group differences in the mean PASI score. The significance for each of these contrasts was set at 0.017 (0.05/3). For all other variables, a p-value of <0.05 was considered statistically significant. 95% confidence intervals (95% CI) were generated for the proportions of patients who reported skin pain or skin discomfort.

RESULTS

Prevalence

In this sample, 41.7% (95% CI, 33.8–50.0%) of patients reported skin pain and 36.7% (95% CI, 29.1–45.0%) of the patients reported skin discomfort.

Differences in demographic and clinical characteristics

The majority of the patients were women (56.8%), married (61.2%), and working (60.4%). Their mean age was 51.4 years (± 13.2; range 18–84 years). No differences were found among the three groups on any of the demographic characteristics (Table I).

The mean SCQ-18 score was 5.4 (± 4.3). Back/neck pain (38.8%), headache (28.8%), hypertension (24.5%), rheumatoid arthritis (22.3%), and depression (17.3%) were the most common co-morbidities. No differences were found among the three groups in terms of co-morbidity profile.

The mean PASI score was significantly higher in patients with pain (7.1 ± 5.8) and discomfort (5.4 ± 4.1) than patients with no pain/discomfort (2.7 ± 2.4) (all $p<0.01$) (Table II). Higher percentages of patients in the pain and discomfort groups reported exacerbated psoriasis condition compared with those in the no pain/discomfort group ($p<0.006$). Furthermore, a higher percentage of patients in the no pain/discomfort group reported improved psoriasis condition compared with those in the pain and discomfort groups ($p<0.006$). No differences were found among the three groups in terms of mean duration of psoriasis, medication and topical treatment.

Symptom characteristics

Mean symptom intensity scores (0–10 NRS) ranged from 4.0 to 5.6 in the pain group, and from 2.7 to 3.7 in the discomfort group (Fig. 1).

Except for the quality "throbbing", no significant differences were found between the patients with pain

Table I. *Differences in demographic characteristics among patients with pain, discomfort and no pain/discomfort*

Characteristics	Pain $n=58$ (41.7%)	Discomfort $n=51$ (36.7%)	No pain/ discomfort $n=30$ (21.6%)	Statistics
Age (years), mean ± SD	49.7 ± 13.8	51.8 ± 13.6	54.1 ± 11.3	F = 1.136 ($p=0.324$)
Gender, % (n)				
Male	39.7 (23)	37.3 (19)	60.0 (18)	$\chi^2 = 4.483$ ($p=0.106$)
Marital status, % (n)				
Unmarried	17.2 (10)	15.7 (8)	10.0 (3)	
Married/cohabitant	53.4 (31)	66.7 (34)	66.7 (20)	$p=0.531$[a]
Divorced/widowed	29.3 (17)	17.6 (9)	23.3 (7)	
Living arrangement, % (n)				
Alone	27.6 (16)	25.5 (13)	16.7 (5)	
Spouse	32.8 (19)	39.2 (20)	60.0 (18)	$\chi^2 = 6.179$ ($p=0.186$)
Family/others	39.7 (23)	35.3 (18)	23.3 (7)	
Employment status, % (n)				
Employed	56.9 (33)	60.8 (31)	66.7 (20)	$\chi^2 = 0.794$ ($p=0.672$)
Unemployed	43.1 (25)	39.2 (20)	33.3 (10)	
Education, % (n)				
Primary school	12.1 (7)	15.7 (8)	23.3 (7)	
Secondary school	44.8 (26)	47.1 (24)	23.3 (7)	$p=0.175$[a]
University ≤4 years	20.7 (12)	27.5 (14)	33.3 (10)	
University >4 years	22.4 (13)	9.8 (5)	20.0 (6)	
Ethnicity, % (n)				
Norwegian	91.4 (53)	98.0 (50)	93.3 (28)	$p=0.329$[a]
Other	8.6 (5)	2.0 (1)	6.7 (2)	

[a]Fisher's exact test. SD: standard deviation.

Table II. *Differences in endorsed qualitites and interference items between patients with pain, discomfort and no pain/discomfort*

Characteristics	Pain (1) $n=58$ (41.7%)	Discomfort (2) $n=51$ (36.7%)	No pain/discomfort (3) $n=30$ (21.6%)	Statistics
SCQ-18 (0–54), mean ± SD				
Co-morbidity score	5.6 ± 4.5	5.3 ± 4.1	5.2 ± 4.6	KW$\chi^2=0.385$ ($p=0.825$)
PASI (0–72), mean ± SD	7.1 ± 5.8	5.4 ± 4.1	2.7 ± 2.4	KW$\chi^2=20.648$ ($p<0.0001$) 1 and 2 > 3[a]
Ps overall condition, % (n)				
Stable	22.4 (13)	25.5 (13)	43.3 (13)	$\chi^2=29.772$ ($p<0.0001$)
Improved	13.8 (8)	17.6 (9)	50.0 (15)	Not significant[b]
Exacerbated	63.8 (37)	56.9 (29)	6.7 (2)	1 and 2 < 3[b] 1 and 2 > 3[b]

[a]Statistically significant pairwise contrast $p<0.017$.
[b]Statistically significant pairwise contrast $p<0.006$.
KW: Kruskal Wallis test; MU: Mann-Whitney U test; PASI: Psoriasis Area and Severity Index; Ps: psoriasis; SCQ: Self-Administered Comorbidity Questionnaire; SD: standard deviation.

or discomfort in any of the symptom qualities they endorsed (Table III). In both groups, the most frequently reported qualities were unpleasant (100%), surface (99%), sensitive (96%), itchy (96%), hot/burning (93%), tender (84%), and tingling (79%). The mean severity scores (0–10 NRS) for these seven most common symptom qualities were significantly higher for the pain than the discomfort group (all $p<0.05$). The severity scores ranged from 4.4 to 6.6 in patients with pain, and from 2.7 to 5.2 in patients with discomfort (Table IV).

Significantly higher percentages of patients with pain (88–94%) reported that their symptom interfered with mood, work, sleep, and relations with other people compared with patients with discomfort (54–77%) (all $p<0.05$) (Table III). Mean severity scores (0–10 NRS) for the interference items ranged from 3.8 to 5.0 in patients with pain and from 1.9 to 2.7 in patients with discomfort (Table IV). Patients with pain reported significantly higher severity scores on all interference items (all $p\leq0.001$), except from walking ability.

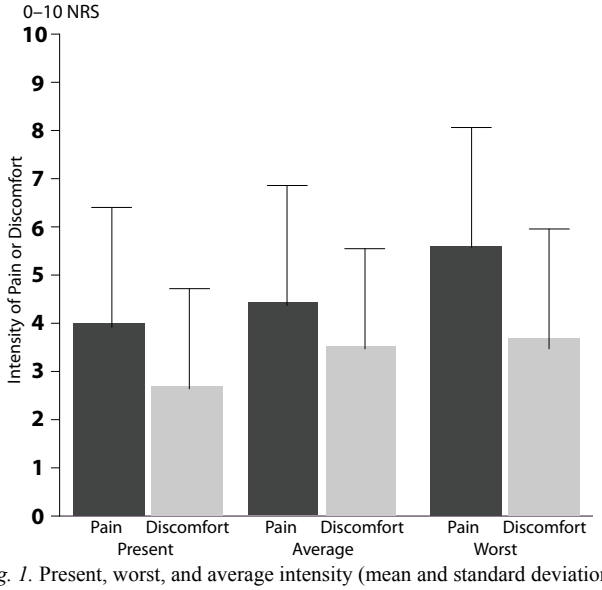

Fig. 1. Present, worst, and average intensity (mean and standard deviation) of skin pain and skin discomfort over the past 24 h in patients with psoriasis. NRS: numeric rating scale.

DISCUSSION

In this study, almost 80% of patients with psoriasis reported sensory skin symptoms. Patients with skin pain or skin discomfort had more severe psoriasis than those

Table III. *Differences in endorsed qualities between patients with pain and discomfort*

Symptom characteristics	Pain $n=58$	Discomfort $n=51$	Statistics[b]
Qualities[a], % (n)			
Itchy	95.8 (46)	95.8 (46)	$p=1.000$
Unpleasant	100.0 (49)	100.0 (48)	
Surface	98.0 (48)	100.0 (48)	$p=1.000$
Sensitive	97.9 (47)	93.6 (44)	$p=0.362$
Hot/burning	95.9 (47)	89.6 (43)	$p=0.268$
Tender	91.5 (43)	76.6 (36)	$p=0.089$
Tingling	87.5 (42)	70.8 (34)	$p=0.077$
Aching	81.3 (39)	68.1 (32)	$p=0.162$
Sharp	79.2 (38)	70.2 (33)	$p=0.352$
Cramping/tight	63.8 (30)	52.1 (25)	$p=0.301$
Throbbing	77.6 (38)	51.1 (24)	**$p=0.010$**
Deep	70.2 (33)	68.8 (33)	$p=1.000$
Heavy	64.6 (31)	45.8 (22)	$p=0.100$
Radiating	63.0 (29)	68.8 (33)	$p=0.664$
Shooting	57.4 (27)	41.7 (20)	$p=0.153$
Dull	62.5 (30)	57.4 (27)	$p=0.678$
Cold	44.7 (21)	33.3 (16)	$p=0.297$
Numb	51.1 (24)	47.9 (23)	$p=0.838$
Electric	34.0 (16)	35.4 (17)	$p=1.000$
Interference with function[a], % (n)			
Sleep	85.7 (42)	66.7 (32)	**$p=0.033$**
Enjoyment of life	91.8 (45)	79.2 (38)	$p=0.090$
Mood	93.9 (46)	77.1 (37)	**$p=0.022$**
Work	91.7 (44)	66.7 (32)	**$p=0.005$**
Daily activities	85.7 (42)	72.9 (35)	$p=0.139$
Relationships with other people	87.8 (43)	54.2 (26)	**$p<0.001$**
Walking ability	77.6 (38)	62.5 (30)	$p=0.124$

[a]"Endorsed" > 0 on an 11-point numeric rating scale (NRS).
[b]Fisher's exact test.
Significant values are shown in bold.

Table IV. *Differences in severity of qualities between patients with pain and discomfort*

Symptom characteristics	Pain $n=58$ (53.2%)	Discomfort $n=51$ (46.8%)	Statistics
Severity of qualities (0–10 NRS), mean ± SD			
Itchy	6.6 ± 3.2	5.2 ± 2.5	**$t=2.4, p=0.019$**
Unpleasant	6.0 ± 2.3	4.4 ± 2.3	**$t=3.3, p=0.001$**
Surface	6.0 ± 2.5	4.2 ± 2.3	**$t=3.8, p<0.001$**
Sensitive	5.9 ± 2.6	4.3 ± 2.7	**$t=2.9, p=0.005$**
Hot/burning	5.6 ± 2.8	3.7 ± 2.5	**$t=3.6, p<0.001$**
Tender	4.9 ± 2.7	3.2 ± 3.0	**$t=2.9, p=0.005$**
Tingling	4.4 ± 3.0	2.7 ± 2.7	**$t=3.1, p=0.003$**
Aching	3.9 ± 3.1	2.2 ± 2.3	**$t=3.1, p=0.003$**
Sharp	3.6 ± 2.9	2.5 ± 2.6	$t=1.9, p=0.062$
Cramping/tight	3.6 ± 3.5	1.9 ± 2.6	**$t=2.7, p=0.008$**
Throbbing	3.2 ± 2.9	1.6 ± 2.2	**$t=3.0, p=0.003$**
Deep	3.2 ± 2.9	2.1 ± 2.2	$t=1.9, p=0.056$
Heavy	3.2 ± 3.2	1.6 ± 2.2	**$t=2.8, p=0.006$**
Radiating	2.7 ± 3.0	2.0 ± 1.9	$t=1.4, p=0.160$
Shooting	2.5 ± 3.1	1.3 ± 2.1	**$t=2.1, p=0.037$**
Dull	2.2 ± 2.4	1.9 ± 2.2	$t=0.6, p=0.558$
Cold	2.0 ± 2.8	1.0 ± 1.9	$t=1.9, p=0.058$
Numb	1.8 ± 2.5	1.8 ± 2.6	$t=0.0, p=0.975$
Electrical	1.4 ± 2.5	1.1 ± 2.0	$t=0.6, p=0.582$
Severity of interference (0–10 NRS), mean ± SD			
Sleep	5.0 ± 3.1	2.6 ± 2.6	**$t=4.1, p<0.001$**
Enjoyment of life	4.9 ± 3.2	2.7 ± 2.6	**$t=3.9, p<0.001$**
Mood	4.8 ± 2.7	2.5 ± 2.5	**$t=4.4, p<0.001$**
Work	4.8 ± 3.0	2.7 ± 2.7	**$t=3.5, p=0.001$**
Daily activities	4.5 ± 2.8	2.7 ± 2.4	**$t=3.3, p=0.001$**
Relationships with other people	3.9 ± 2.9	1.9 ± 2.3	**$t=3.8, p<0.001$**
Walking ability	3.8 ± 3.0	2.7 ± 3.2	$t=1.8, p=0.072$

Significant values are shown in bold.
NRS: numeric rating scale; SD: standard deviation.

with no skin pain/discomfort. Patients with skin pain reported mean pain intensity scores in the moderate range (32–35). Patients used common qualities such as unpleasant, surface, and sensitive to describe both pain and discomfort. In addition, sleep and enjoyment of life were the functions most severely affected by sensory skin symptoms.

The CI for symptom prevalence in the present study indicate that the population prevalence of skin pain probably ranges from 34% to 50% in patients who attend hospital care for psoriasis. Furthermore, the population prevalence of skin discomfort probably ranges from 29% to 45% in this patient population. The width (± 8%) of these CI is relatively narrow. In fact, even the lower limits of these CI indicate higher symptom prevalence compared with estimates from previous research (5, 17, 25). This difference may be attributed to the fact that patients in the present study were asked directly about skin pain and discomfort rather than having the symptom included in a list of skin symptoms (42). In addition, the lower rates in other studies may be due to the exclusion of patients who reported milder symptom severity (25) or symptoms less frequent than "often" (5, 17).

In the present study, larger proportions of patients with pain or discomfort had more severe psoriasis, as well as exacerbation of skin disease, compared with patients with no pain/discomfort. These findings are supported by previous research (9, 10, 12). Of note, both skin lesions (e.g. a defective skin barrier, inflammation) and treatments are potential sources of pain and discomfort. However, in the present study patients did not specify whether the psoriasis itself or the treatments for psoriasis caused skin pain or discomfort.

In the present study, patients rated mean skin pain intensity scores in the moderate range (32–35) (Fig. 1). The ratings of average and worst skin pain were equivalent to pain intensity scores reported by patients with neuropathic pain conditions (32, 43). Cut-points are not established for discomfort intensity measured on 0–10 NRS. However, in the present study patients rated discomfort intensity at the lower end of the NRS (Fig. 1), which may be interpreted as mild symptom intensity. Of note, while all patients who reported discomfort were included in this study's analyses, previous studies (6, 25, 26) included only patients who reported at least moderate discomfort. Methodological differences make it difficult to compare findings on discomfort intensity across studies.

Patients with skin pain and skin discomfort endorsed common symptom qualities (Table III). However, patients with pain reported higher severity scores for a majority of these qualities (Table IV). The most frequent and severe qualities reported by both groups may provide insight into a "set" of specific skin symptom qualities in patients with psoriasis. The "set" includes the affective quality of "unpleasant" and the spatial quality of "surface" rather than "deep". In addition, the sensory qualities of "hot/burning", "sensitive", and "tender" are, from a clinical angle, consistent with psoriasis characteristics such as inflammation and skin trauma. "Sensitive", "hot/burning", and "itchy" are also common and severe qualities reported by patients with neuropathic pain conditions (44, 45). Of note, the type of skin pain (e.g. nociceptive, inflammatory, neuropathic) (46) in patients with psoriasis cannot be determined from this study. Further research that utilizes quantitative sensory testing and skin biopsies may provide such insight.

Larger proportions of patients with pain reported that their skin symptom interfered with function (Table III). These patients also reported more severe interference with function compared with patients with discomfort (Table IV). In fact, 5 of the 7 mean interference severity scores in the pain group were above 4, which suggests a clinically significant level of interference (38, 39). These findings are comparable to pain interference ratings reported by outpatients with cancer (47, 48) diabetic neuropathy (49), and herpes zoster (50). Interestingly, "sleep" and "enjoyment of life" were the interference items with the highest severity scores in the total sample. Previous research (51, 52) suggests

that sleep impairment may be a major problem for patients with psoriasis. Future studies need to examine in depth the association between skin symptoms and sleep disturbance. While previous QoL studies (13) show impaired function in patients with psoriasis, sensory skin symptoms' impact on function was not investigated. Of note, recent research (53) questions patients' ability to distinguish the cause of impaired function. Further studies are needed in order to establish the extent that skin sensory symptoms vs. other disease features have on interference with function.

Patients with pain, discomfort, or no pain/discomfort did not differ on any demographic characteristics. However, previous studies suggest that female gender is associated with pain in patients with psoriasis (2, 5, 12, 17). Recent research (54) showed that pain thresholds and pain tolerance levels were lower in women. Biological as well as psychological differences between the genders were suggested explanations for the higher prevalence and severity of pain found in women. The sample size of the present study may have been too small to detect gender differences.

Patients with or without skin symptoms did not differ in terms of age and co-morbidity profile, as opposed to findings from previous research (2, 5, 12). A possible explanation for the present study's findings may be that skin pain and discomfort from psoriasis was assessed specifically rather than pain and discomfort in general (10–15, 17–19, 28, 46). Therefore, the patients' report of psoriasis related skin pain and discomfort did not account for coexisting pain and discomfort from co-morbidities associated with older age.

Some limitations of the present study are worth noting. The relatively small sample size may have precluded us from finding associations between demographic or clinical characteristics and pain and discomfort (2, 5, 17). Although patients were from several regions of Norway and had mild to severe psoriasis, findings may not be generalizable to general and private practice since the sample was recruited from one hospital dermatology unit. Finally, because of the methods used for quantifying symptom characteristics, a more comprehensive evaluation of the relation between pain and discomfort could not be performed.

In conclusion, findings from this study suggest that psoriasis-related skin pain and skin discomfort may be a larger problem than previously estimated.

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