
Determinants of quality of life in patients with psoriasis: A study from the US population

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Background: Psoriasis is a common disease with substantial effects on quality of life. Few quality of life studies have been performed in psoriasis patients from the general US population.

Objective: To describe the determinants of quality of life in psoriasis patients from the US population.

Methods: Patients were randomly selected from the US population. Patients who identified themselves as having been diagnosed with psoriasis by a physician were invited to complete a more detailed survey about quality of life.

Results: Two hundred sixty-six psoriasis patients from the US population completed the detailed survey. Body surface area showed the strongest association with decrements in quality of life (Spearman 0.50, $P < .0001$). Younger patients and female patients also had statistically significant reductions in quality of life. Increasing psoriasis severity was associated with seeking care from multiple physicians and having decrements in income.

Conclusion: Patients with more extensive skin involvement have greater reductions in quality of life. Female patients and young patients are affected to a greater extent. (J Am Acad Dermatol 2004;51:704-8.)

Psoriasis is a common chronic condition that affects about 1%-3% of the general population.¹⁻³ It is characterized by thick scaling red plaques that can be localized or widespread. Psoriasis can be disfiguring and is associated with

itching and arthritis. Psoriasis treatments include topical therapies, phototherapy, and oral agents such as retinoids, methotrexate, and cyclosporine.^{4,5} The treatment of psoriasis is undergoing a revolution with the advent of novel biologic therapies that target the immune system. The treatment of psoriasis adds substantial costs to the health care system⁶ and may also be associated with risks for adverse events.⁷ Therefore, it is important to understand the impact psoriasis has on health-related quality of life in order to gain perspective on the costs and risks of psoriasis therapies. Identifying factors that determine the impact psoriasis has on quality of life may help guide treatment strategies by helping to identify subsets of patients most likely to benefit from systemic psoriasis therapies.

Health-related quality of life measures the impact a disease has on patients' physical, mental, and social well-being. A variety of previous studies have demonstrated that psoriasis can have a substantial impact on health-related quality of life.⁸⁻¹² These studies have primarily been performed in patients from specialty clinics or members of psoriasis lay organizations. An important component of health-related

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quality of life is the degree of disability that the medical condition creates in daily activities, work, personal relationships, and leisure time activities. To better understand the determinants of quality of life related to psoriasis in the US population we conducted a study of psoriasis patients from the population using random digit dial techniques.

METHODS

Generation of questionnaire

A comprehensive questionnaire was created to survey the epidemiologic characteristics of psoriasis in the continental US population. The survey items were generated by a committee of dermatologists in collaboration with the National Psoriasis Foundation. Items included socio-demographic variables, treatment history, extent of disease, and quality of life. Quality of life was assessed using a version of the Psoriasis Disability Index (PDI) modified for use in the US population.^{13,14} The response options were: very much (3), a lot (2), a little (1), or not at all (0). Fifteen questions dealing with daily activities, work, personal relationships, leisure activities, and treatment were asked and the possible range of scores was 0-45, with higher scores indicating greater disability. Those individuals with psoriasis were also asked a single global question to determine the degree to which psoriasis is a problem in every day life based on a 10-point scale. Patients were also asked to report their current extent of psoriasis based on the amount of psoriasis that could be covered by the palm of the respondent's hand. Respondents could choose no or very little psoriasis, only a few patches that could be covered by 1-2 palms (approximately 1%-2% body surface area), scattered patches that could be covered by between 3 and 10 palms (approximately 3%-10% body surface area), or extensive psoriasis covering large areas of the body that would be more than 10 palms (>approximately 10% body surface area). Previous investigators have demonstrated that patients can reliably report body surface area of involvement with psoriasis.¹⁵ Body surface area as determined by the number of a patient's palms that can cover their psoriasis has often been used as a marker of psoriasis severity, and 10 palms (eg, approximately 10% of body surface area) of involvement has often been used as an inclusion criterion for entry into Food and Drug Administration regulated clinical trials of psoriasis therapies.

Survey administration and sampling techniques

In November 2001 to December 2001, the National Psoriasis Foundation commissioned two

contract survey organizations to interview a stratified sample of the general population age 18 or older who were residents of the contiguous 48 United States in order to identify people who report having been diagnosed by a physician as having psoriasis. The two organizations conducted their surveys independently and on different study subjects but used the same sampling method and questionnaires. In the general population, households to be contacted were selected by random digit dialing and were called up to 3 times before being replaced by a next randomly selected telephone number. Participants who identified themselves as having been diagnosed by a physician with psoriasis completed a brief survey and were then invited to complete a more detailed questionnaire to be administered via a follow-up phone call in 261 patients or via the internet in 5 patients. The data described in this paper is from the population of patients who completed the more detailed follow-up questionnaire. This study was approved by the Western Institutional Review Board.

Data analysis

Descriptive data were generated to determine the demographic characteristics of the study population. Dichotomous outcomes were tested using the Student *t* test for continuous variables or Wilcoxon rank sum test for ordinal variables and those unlikely to be normal. Categorical variables (eg, differences among groups of individuals) were analyzed with the Kruskal-Wallis test and differences between contiguous strata were assessed with the Wilcoxon rank sum test. Measures of association were investigated with the Spearman rank correlation (ρ). Patients who did not answer the question regarding body surface area were dropped from the analysis ($N = 2$). For questions regarding income, 27 patients (10.23%) were dropped from the analysis because they did not know or refused to answer. For patients who answered "Don't know" or "Refused" on individual items on the PDI, a score of zero (not at all) was imputed to be conservative. For any particular PDI question 0%-3% of patients required imputation of their score. Data were analyzed using STATA, 7.0 (College Station, Tex).

RESULTS

In the initial survey, 601 of 27,220 participants reported that they had been diagnosed by a physician as having had psoriasis (2.2%). Three hundred twenty-eight participants in the initial survey agreed to be re-contacted for the more extensive questionnaire, and 266 completed the in-depth questionnaire. Patients completing the follow-up questionnaire were similar to the original sample in terms of age

Table I. Characteristics of study population

Variable	Initial survey	Follow-up
N	601	266
Male	244 (40.6%)	110 (41.35%)
Female	357 (59.40%)	156 (58.65%)
Age (mean)	50	47
Extent of psoriasis		
None to little:	333 (57.41%)	88 (33.33%)
1-2 palms	153 (26.38%)	91 (34.47%)
3-10 palms	73 (12.59%)	64 (24.24%)
10+ palms	21 (3.62%)	21 (7.95%)
Impact of psoriasis (scale 1-10)	3.6	4.19 ($P < .05$, t test)
Duration of psoriasis	N/A	18.47 years (SD 14.9)
Psoriatic arthritis	N/A	13.5%
Mean PDI (median, 25 th , 75 th percentile)	N/A	4.88 (3, 0, 7)

N/A, Not applicable; PDI, psoriasis disability index; SD, standard deviation.

and sex characteristics. However, patients completing the more detailed follow-up questionnaire were more likely to have extensive skin involvement and were more likely to say that psoriasis had a significant impact on their life (Table I).

The demographic characteristics of the patients who completed the detailed follow-up survey are shown in Table I. The average age was 47; the average duration of disease was 18.47 years; the mean PDI score was 4.88; and 13.5% of patients reported a diagnosis by a doctor with psoriatic arthritis in addition to their psoriasis. There was no difference in the distribution of extent of psoriasis based on sex ($P = .44$, rank sum). Extent of disease was not associated with duration of disease (Spearman ρ 0.06, $P = .32$), or patient age (Spearman's ρ 0.04, $P = .52$).

Table II demonstrates that as patients report more extensive skin involvement with psoriasis they have increasing impairment in health-related quality of life as measured by the overall PDI score. Even patients with relatively minimal psoriasis (eg, 1-2 palms) had statistically significant decrements in their quality of life compared to patients with no to minimal psoriasis at the time of the interview. Similarly, as patients reported an increased amount of skin involvement, the patients also reported psoriasis being a greater problem in everyday life based on a single global question. Female patients had greater decrements in health-related quality of life than male patients despite having a similar self-report of extent of psoriasis (Table II).

Table III shows that the extent of skin involvement with psoriasis is moderately correlated

(Spearman's ρ 0.5, $P < .0001$) with impairment of health-related quality of life as measured by the PDI. Psoriasis disability was also associated with patients seeking care from multiple physicians for their psoriasis (Spearman's ρ 0.31 $P < .0001$). Younger age was associated with greater impairment of quality of life, but this correlation was weak (Spearman's ρ -0.16, $P = .0075$). Extent of psoriasis (Spearman's ρ -0.13, $P = .04$) and the psoriasis disability index (Spearman ρ -0.29, $P < .0001$) were both negatively correlated with income status. Duration of disease had no correlation with quality of life measures demonstrating that patients do not necessarily adapt to their disease over time.

DISCUSSION

The results of this study demonstrate that psoriasis is a significant problem in everyday life and has significant impairment of health-related quality of life as measured by the PDI for patients in the US population. The most important factor related to quality of life was extent of skin involvement with psoriasis. This finding is consistent with a variety of previous studies indicating that body surface area of skin involvement with psoriasis mediates much of the reduction in quality of life associated with psoriasis.^{12,13,15} Decrements in quality of life related to psoriasis were also associated with patients seeking care from multiple physicians for their psoriasis. This observation likely represents that patients who are affected by psoriasis are often not satisfied with their treatment as previously reported.¹

Age demonstrated a weakly negative correlation with quality of life related to psoriasis suggesting that younger patients have a tendency towards being more impaired by their psoriasis. This finding is consistent with previous studies.¹¹ Additionally, female patients had greater impairment in quality of life compared to male patients. Interestingly, this finding was not observed when the PDI was applied to Nordic patients with psoriasis.¹² Our finding that young patients and female patients suffer the greatest impairment from psoriasis has important treatment implications. In particular, traditional systemic agents such as methotrexate and acitretin are associated with fetotoxic and teratogenic effects that limit their use in women of child-bearing potential. Treatment options that can be used in people of child-bearing potential are needed particularly since this is the population of patients whose quality of life is most affected by psoriasis. New biologic treatments may have an important role to play in treating patients of child-bearing potential.

Importantly, greater impairment of quality of life and greater extent of skin involvement with psoriasis

Table II. Impact of extent of psoriasis and gender on psoriasis-related quality of life

Variable	Degree to which psoriasis is a problem in everyday life: Mean (Median, 25th, 75th percentile) (1, no problem-10, a very large problem)	Psoriasis Disability Index Score: (Mean, Median, 25th, 75th percentile) (higher scores indicate greater impairment)
Extent of psoriasis		
None to little	3.03 (2, 1, 4)	2.1 (0, 0, 3)
1-2 palms	3.74 (3, 2, 5)	4.26 (2, 0, 6)
3-10 palms	5.5 (5, 4, 8)	7 (5, 2.5, 10.5)
10+ palms	6.9 (7, 5, 10)*	12.66 (13, 6, 19) [†]
Gender		
Male	3.8 (3, 2, 5)	4.48 (1, 0, 5)
Female	4.47 (4, 2, 7) [‡]	5.15 (3.5, 0, 8) [§]

* $P < .0001$ Kruskal-Wallis. $P < .05$ Spearman rank sum test for comparisons between each contiguous stratum.

[†] $P < .0001$ Kruskal-Wallis. $P < .01$ Spearman rank sum test for comparisons between each contiguous stratum.

[‡] $P = .01$, Spearman rank sum test.

[§] $P = .02$, Spearman rank sum test.

Table III. Association of Psoriasis Disability Index Score with age, duration of psoriasis, extent of psoriasis, number of physicians seen in the past 2 years for psoriasis, and income

Variable	Spearman's ρ	P value
Age	-0.16	.0075
Duration of psoriasis	0.0144	.81
Extent of psoriasis	0.50	<.0001
Number of physicians seen in the last 2 years for psoriasis	0.31	<.0001
Income	-0.29	<.0001

were associated with decrements in income. It is possible that having more severe psoriasis may create economic obstacles for patients leading to lower incomes. Alternatively, patients with fewer economic resources may have less access to treatment resulting in more severe disease. Our results suggest that patients most in need of aggressive psoriasis therapy (eg, because of extensive disease and greater impairment in quality of life) may have limited access to care given the associated decrements in income. Previous large studies of members of the National Psoriasis Foundation have indicated that psoriasis can have a detrimental impact on employment and financial well-being.¹⁰ Additional studies are necessary to better understand the impact of psoriasis on patients' socioeconomic functioning.

As with any study there are limitations to consider. First, patients who completed the detailed study of quality of life were more likely to say that psoriasis was a problem in everyday life and were more likely to have extensive disease than patients who did not complete the follow-up survey. Although the findings of this study are internally valid, they may not generalize to the population of patients that did not

agree to complete the more detailed study. However, we believe this is unlikely. Importantly, since the patients were selected from the population (as opposed to members of advocacy organizations or subspecialty clinics), our study is more representative of psoriasis patients in general. Furthermore, 20% of the respondents in this study did not see a doctor for psoriasis in the previous 2 years, indicating that this study captured data on patients not ordinarily available for clinic-based studies. A second limitation is that our measure of quality of life included a global question and an adaptation of the PDI. These measures have not been formerly tested as to their reliability and validity in the United States population.^{13,16,17} Furthermore, the PDI is not a comprehensive measure of quality of life.^{3,18,19} Nevertheless, this study found meaningful alterations in quality of life using the global question and the modified version of the PDI.

This study found significant reductions in the quality of life of people with psoriasis. Our findings have important implications when considering those treatments that have significant risks or high cost. The impact of the disease is greater in those with more extensive skin involvement and in young and female patients. Treatments that have high risks or high cost should be reserved for those patients with more extensive disease, that is, patients in whom the disease is having a large effect on quality of life.²⁰

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