Psoriasis Is Associated With Worse Quality of Life Compared With the Other 12 Skin Diseases: A Cross-sectional Study

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Research

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Abstract

Background: Skin diseases impair patients' quality of life (QoL). Psoriasis is of particular concern because it affects multiple facets of patients' lives.

Objective: The aim of this study was to investigate whether having psoriasis was associated with the more severe QoL impairment compared with the other 12 skin diseases, based on the Dermatology Life Quality Index (DLQI).

Methods: This multicenter observational cross-sectional study was conducted in 9

centers in China. Socio-demographic variables and health history were collected with a standardized form questionnaire. QoL was measured by the DLQI. DLQI scores were compared between patients with psoriasis and without psoriasis using univariate analysis. Then multivariate linear regression was used to related QoL to groups (psoriasis vs. non psoriasis), clinical and socio-demographic characteristics.

Results: Of 8,339 included dermatological participants, 1,310 (15.7%) had psoriasis, and 7,029 (84.3%) did not. The QoL of patients with psoriasis was lower than that of patients without psoriasis based on the DLQI score (11.20 ± 7.37 vs 8.12 ± 6.26, $P < 0.05$). The results of multivariate linear regression indicated the same results when adjusting clinical and socio-demographic characteristics.

Conclusion: Patients with psoriasis experience more quality of life impairment than patients without psoriasis. More attention should be paid to patients with psoriasis in dermatological health policy decision.

Introduction

Skin and subcutaneous diseases were the 18th leading cause of global disability-adjusted life years (DALYs) according to Global Burden of Disease Study 2013 [1]. Additionally, skin conditions were the fourth leading cause of nonfatal disease burden at the global level [2]. Skin diseases diminish patients' quality of life (QoL) [3], due to several issues. These include chronic disability and disfigurement, and symptoms such as discomfort and related stigma [4]. A growing body of literature has illustrated dermatosis' negative effect on QoL [5]. Thus, the importance of measuring QoL has increasingly been recognized in both dermatology clinical care and research settings [6]. A study from 13 European countries has confirmed the large effect of skin conditions on patient well-being, differentiating between facets of QoL as assessed with the generic instrument EQ-5D [7].

Psoriasis is a common chronic inflammatory skin disease with an estimated prevalence ranging from 0.51−11.43% in adults and 0−1.37% in children [8]. Due to the immediate visibility of the diseases, patients with psoriasis experience physical discomfort, impaired emotional functioning, negative body image, and daily activity impairments that contributes to their decreased quality of life (QoL) [9−11]. It is

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one of the most commonly focused issues in psychodermatology [12], therefore, the content about QoL with psoriasis have been broadly investigated and reported [13–16].

The 10-item Dermatology Life Quality Index (DLQI) is the most common dermatology-specific QoL measure for skin diseases. It was developed in 1994 [17–19]. The DLQI's brevity and ease of use have resulted in its popularity in both clinical practice and research [20]. The DLQI is a self-administered, easy and user-friendly questionnaire with an average completion time of 126 s [21]. It has been used for at least 33 skin conditions in at least 32 countries, and is available in 55 languages [20]. The DLQI was translated into Mandarin Chinese by Wang XL et al. who assessed its validity and reliability in 2004 [22]. The Chinese version of DLQI has also been demonstrated to be valid and reliable in patients with psoriasis [23]. Among 202 studies of skin conditions, the DLQI was administered to more patients with psoriasis than to those with any other skin condition [20].

Skin diseases have a great impact on the QoL, and psoriasis has attracted much attention. Therefore, there were some studies comparing psoriasis QoL with other dermatologic diseases. A study that compared psoriasis patients' QoL with that of those with atopic dermatitis (AD) showed that the mean DLQI score showed no statistically significant difference between the two. However, there was a higher effect on patients with psoriasis who had mild disease severity [24]. Another study demonstrated that psoriasis affects quality of life more than vitiligo [25]. Ghajarzadeh et al. also found patients with psoriasis had more impaired disease-related QoL than vitiligo or Alopecia areata patients [26].

Given the small number of dermatological studies comparing the QoL in psoriasis cases with those of other skin diseases, this study used the DLQI to assess whether subjects with psoriasis were associated with worse QoL than subjects with the other 12 common skin diseases in a large sample of dermatological patients across China.

Materials And Methods

Study design and participants

This study was designed as a cross-sectional observational study in China. It was conducted in the dermatology departments of 9 hospitals located in different regions of China, between 2013 and 2015. We recruited patients who had been diagnosed with common dermatological diseases, including those with psoriasis and without psoriasis, aged 16 years or older, and who could provide written informed consent. We excluded those with mental illness. The study was reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) recommendations [27].

Measures

Dermatologists administered a standardized questionnaire to collect data about socio-demographic variables and health history. The questionnaires were completed by the participants. Socio-demographic variables contained information on age, sex, marital status, and education. Health history collected data

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regarding current diagnosis of skin diseases, disease duration, age of onset, smoking, drinking, exercise and comorbidities. For disease severity, none disease-specific assessment tool was used, as various diseases were investigated and severity scores assessed by different tools for different skin diseases are incomparable. The severity was assessed by qualified dermatologists with standardized training using a five-point scale (1 = very mild, 2 = mild, 3 = moderate, 4 = severe, 5 = very severe).

QoL was measured with the DLQI in this study. The DLQI is a patient-reported instrument consisting of 10 multiple-choice questions. Each question has 4 answers which evaluate the effects of diseases on key facets of patient's lives. It consists of the following six headings: symptoms and feelings; daily activities; leisure; work and school; personal relationships; treatment. DLQI scores range from 0 to 30, with a high score indicating greater QoL impairment.

Statistical analysis

The observed variables were summarized between patient groups with and without psoriasis. Categorical variables were presented as frequencies and percentages. Continuous variables were expressed as mean and standard deviation (SD) or median with interquartile range (IQR). Univariate differences between groups were assessed using the either a t-test or a Mann-Whitney test for continuous variables and a Chi square test for categorical variables. For analytical purposes, disease severity was categorized into 3 levels: mild (very mild and mild), moderate, severe (severe and very severe). A DLQI subgroup analysis was performed for these 3 severity levels, for both those patients with and those without psoriasis, considering that disease severity was the most influential factor on QoL, based on the results of previous studies [28, 29]. The difference was analyzed with a t-test.

Multivariate linear regression determined the association between DLQI score and group, adjusting for known confounders. First, groups were treated as the independent variable. Then, disease severity was included to adjust for confounding. Finally, all variables that presented a $P < 0.2$ in univariate analysis were adjusted in the model. The collinearity of these variables was evaluated.

Sensitivity analysis was conducted to assess the robustness of our findings. In the non psoriasis group, we restricted analyses to patients with neither acne nor eczema, because of their large proportion in this group. Then, we reanalyzed our data with linear regression.

When there was one item of the DLQI left unanswered, it was scored 0. When two or more items of DLQI were left unanswered, the questionnaire was excluded from the analysis. All analyses were performed in SPSS version 18.0 (IBM SPSS Inc, Armonk, New York, USA).

Results

Sample characteristics

In total, 8,339 patients were included. A total of 1,310 patients reported a psoriasis diagnosis, and the
2 other skin diseases (Table 1). These patients were

classified as the non psoriasis group. The demographic and clinical variables were tested by univariate analyses. The mean ages were 38.22 ± 13.81 and 31.50 ± 12.87 for subjects with psoriasis and those without, respectively ($P < 0.001$). Patients' mean BMI was 23.51 ± 3.78 in the psoriasis group and 21.23 ± 3.09 in the non psoriasis group ($P < 0.001$). Median (IQR) disease duration among the patients with psoriasis was 7.00 (2.25–13.42), compared to the patients without psoriasis for which the median (IQR) disease duration was 1.42 (0.42–3.83). This difference was statistically significant ($P < 0.001$). Among the psoriasis cases, 58.8% were male, 70.4% were married, 79.4% were at least college educated, 36.2% had smoking history, and 31.6% had drinking history, compared to 32.0%, 46.2%, 88.5%, 33.4%, 40.6% among the cases without psoriasis ($P < 0.001$). No statistically significant differences were observed for age of onset, smoking, exercise, or comorbidities. The baseline characteristics are summarized in Table 2.

Table 1

Disease categories and DLQI[†] scores

Diagnosis	N (%)	DLQI score Mean ± SD
Psoriasis	1,310 (15.7)	11.20 ± 7.37
Non psoriasis	7,029 (84.3)	8.12 ± 6.26
Acne	2,946 (35.3)	7.73 ± 5.70
Eczema	1,332 (16.0)	10.00 ± 7.05
Urticaria	718 (8.6)	8.01 ± 6.07
Non-specific Dermatitis	517 (6.2)	8.37 ± 6.26
Seborrheic dermatitis	311 (3.7)	7.31 ± 6.39
Alopecia	260 (3.1)	4.51 ± 4.41
Herpes	257 (3.1)	10.80 ± 7.00
Chloasma	165 (2.0)	6.22 ± 6.02
Folliculitis	141 (1.7)	6.95 ± 6.15
Neurodermatitis	131 (1.6)	7.43 ± 5.93
Alopecia areata	129 (1.5)	4.66 ± 4.47
Contact dermatitis	122 (1.5)	9.46 ± 6.85
[†]DLQI, Dermatology Life Quality Index		

Table 2
Subjects' demographic and clinical characteristics

Variable		Total (N = 8,339)	Psoriasis (N = 1,310)	Non psoriasis (N = 7,029)	P
DLQI[†] scores Mean(SD)		8.60 ± 6.54	11.20 ± 7.37	8.12 ± 6.26	< 0.001
Sex, *n* (%)	Male	2,997 (36.2)	765 (58.8)	2,232 (32.0)	< 0.001
	Female	5,289 (63.8)	536 (41.2)	4,753 (68.0)	
Age (years) Mean(SD)		32.56 ± 13.25	38.22 ± 13.81	31.50 ± 12.87	< 0.001
Disease duration (years) Median (IQR)		2.00 (0.50-5.00)	7.00 (2.25–13.42)	1.42 (0.42–3.83)	< 0.001
Age of onset (years) Mean(SD)		28.72 ± 13.10	28.38 ± 13.19	28.78 ± 13.09	0.317
Disease severity, *n* (%)	Mild	2,805 (34.7)	307 (24.4)	2,498 (36.6)	< 0.001
	Moderate	4,129 (51.1)	673 (53.5)	3,456 (50.7)	
	Severe	1,144 (14.2)	278 (22.1)	866 (12.7)	
BMI[‡] Mean(SD)		21.60 ± 3.13	23.51 ± 3.78	21.23 ± 3.09	< 0.001
Marital status, *n* (%)	Married	4,122 (50.0)	913 (70.4)	3,209 (46.2)	< 0.001
	Unmarried	4,114 (50.0)	384 (29.6)	3,730 (53.8)	
Education, *n* (%)	Primary school or below	183 (2.2)	37 (2.8)	146 (2.1)	< 0.001
	High school	886 (10.7)	231 (17.7)	655 (9.4)	
	College or above	7,202 (86.4)	1,035 (79.4)	6,167 (88.5)	
Smoking, *n* (%)	No	5,459 (66.2)	826 (63.8)	4,633 (66.6)	0.053

[†]DLQI, Dermatology Life Quality Index

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Variable		Total (N = 8,339)	Psoriasis (N = 1,310)	Non psoriasis (N = 7,029)	P
	Yes	2,791 (33.8)	468 (36.2)	2,323 (33.4)	
Drinking, *n* (%)	No	4,989 (60.8)	872 (68.4)	4,117 (59.4)	< 0.001
	Yes	3,212 (39.2)	402 (31.6)	2,810 (40.6)	
Exercise, *n* (%)	No	3,518 (43.2)	567 (44.8)	2,951 (42.9)	0.210
	Yes	4,622 (56.8)	698 (55.2)	3,924 (57.1)	
Comorbidity, *n* (%)	No	4,665 (57.2)	3,911 (56.8)	742 (58.3)	0.326
	Yes	3,493 (41.9)	531 (41.7)	2,974 (43.2)	
[†]DLQI, Dermatology Life Quality Index					
[‡]BMI, Body Mass Index					

DLQI scores

The average DLQI score for patients with psoriasis was 11.20 ± 7.37, while that of patients without psoriasis was 8.12 ± 6.26 (P< 0.001). We also found that the DLQI score for subjects with psoriasis was higher than all other skin diseases (Table 1). For six aspects of DLQI, patients with psoriasis showed statistically significantly higher scores than those without psoriasis (Table 3). Furthermore, considering that disease severity could be the most important factor affecting DLQI score, we conducted a subgroup analysis based on disease severity as mild, moderate and severe levels. A significant result was observed in the two groups at each disease severity level (shown in Fig. 1).

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Table 3

Score for each DLQI[†] aspect

Category	Psoriasis	Non psoriasis	P
	Mean ± SD	Mean ± SD	
Symptoms and feelings	2.68 ± 1.54	2.27 ± 1.40	< 0.001
Daily activities	2.37 ± 1.82	1.62 ± 1.59	< 0.001
Leisure	2.20 ± 1.74	1.57 ± 1.54	< 0.001
Work and school	1.15 ± 1.05	0.86 ± 0.89	< 0.001
Personal relationships	1.64 ± 1.70	1.02 ± 1.35	< 0.001
Treatment	1.19 ± 0.99	0.79 ± 0.87	< 0.001
[†]DLQI, Dermatology Life Quality Index			

Associations between DLQI and psoriasis

The results of the multivariate linear regression analyses are shown in Table 4. In the model 1, the higher DLQI score was significantly associated with the psoriasis group (β = 3.086, (95% CI, 2.702 to 3.471). In the model 2, higher DLQI was also associated with psoriasis when adjusting for disease severity (β = 2.533, (95% CI, 2.153 to 2.912). Finally, in the model 3, higher DLQI was significantly associated with psoriasis group when adjusting disease severity, duration, sex, age, BMI, marital status, education, smoking and drinking, which were significant different between the two groups in univariate analysis in Table 2 (β = 2.030, (95% CI, 1.576 to 2.483). The detailed information about other variables in the model 3 was presented in Additional file 1 (Table S1).

Table 4

Summary of the DLQI[†] models' adjusted effects[‡]

	Groupβ	95% CI	P	$\varvec{R}^2$
Model 1	3.086	2.702−3.471	< 0.001	0.029
Model 2	2.533	2.153−2.912	< 0.001	0.095
Model 3	2.030	1.576−2.483	< 0.001	0.097
[†]DLQI, Dermatology Life Quality Index				
[‡]Dependent variable: DLQI scores; Independent variables: Model 1 (groups); Model 2 (groups and disease severity); Model 3 (groups, disease severity, disease duration, sex, age, BMI, marital status, education, smoking and drinking)				

Sensitivity analysis

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We conducted sensitivity analysis after excluding patients with acne or eczema, which are provided in the in Additional file 2. The subjects' characteristics are described in Table S2. The results showed that the DLQI score for psoriasis patients was still higher than those without psoriasis. (Table S3, S4)

Discussion

This observational study has investigated whether patients with psoriasis had the most severely impaired QoL among 13 skin diseases. The data came from the DLOI of a large sample of dermatological patients in China. A total of 8,339 participants were included. The study's major finding was that patients with psoriasis had worse QoL than patients without psoriasis, even after adjusting for demographic factors and other common health conditions. The sensitivity analysis also showed a high degree of robustness after excluding subjects with acne or eczema.

Previous studies have shown that QoL measured by the DLQI in patients with psoriasis is lower than that of patients with AD, vitiligo or alopecia areata [24–26]. Our findings corroborate these studies. However, a study from Denmark found that patients with AD reported the greatest DLQI impairment among patients suffering from psoriasis and other dermatological diseases, which did not adjust for possible confounding factors to assess whether there was a statistically significant difference [30]. In contrast, another study reported no significant difference between AD and psoriasis when controlling for 4 confounding factors (age, sex, diagnosis and concomitant diseases) [31]. Our study confirmed that patients with psoriasis were associated with worse QoL than patients with other skin diseases, when controlling for 9 factors.

The mean DLQI score for patients with psoriasis in this study was 11.20. This is higher than the previous mean DLQI for subjects with psoriasis in several other studies [17, 32, 33]. However, there have been several studies which have reported lower DLQI means for patients with psoriasis than ours [24–26]. Our results are in accordance with those from studies conducted in China [22, 23]. This demonstrated that our sample was representative. We also analyzed six aspects of the DLQI, and the scores for patients with psoriasis along any aspect were higher than that of those without psoriasis. This was consistent with the above results.

Disease severity was an important factor affecting QoL. The more severe the disease, the higher the DLQI score. A study from Norway and South Africa has demonstrated this [28, 29]. In order to eliminate disease severity's influence on DLQI scores, we conducted both subgroup analysis and multivariate linear regression. The results showed a statistically significant difference in DLQI scores between the two groups, even if disease severity was controlled.

A major strength of our study is the large study population collected from several large clinical centers. Additional strengths include the assessment with well-validated measurement-DLQI, and the multivariate linear regression model for controlling confounding effects.

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This study does have several limitations. Firstly, this cross-sectional study was based on the population of dermatology patients in China, rather than the overall population. Therefore, the prevalence of psoriasis was much higher than that of the general population (15.7% and 0.47%, respectively) [34]. Thus, the likelihood of selection bias is high. Secondly, a cross-sectional study cannot establish causality between psoriasis and QoL. Finally, the judgment of disease severity was not based on specific criteria for each disease, and this may have affected the accuracy. However, qualified dermatologists with standardized training could maintain the comparability.

Conclusions

The present results indicate that patients with psoriasis suffer worse QoL than patients without psoriasis. This finding suggests a need for attention to psoriasis patients' QoL in clinical care when formulating treatment plans, making treatment decisions, or conducting research. Taken together, dermatologists should incorporate improving patient QoL into their clinical psoriasis management.

Abbreviations

QoL
Quality of life; DLQI:Dermatology Life Quality Index; DALYs:Disability-adjusted life years; AD:Atopic dermatitis; SD:Standard deviation; IQR:Interquartile range; BMI:Body Mass Index;

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the Declaration of Helsinki. The protocol was approved by the Ethics Committee at the Guangdong Provincial Hospital of Chinese Medicine. All participants signed a written consent form.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used in the current study are available from the corresponding author upon reasonable request.

Competing interests

All authors declare no conflict of interest.

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Authors' contributions

CL, ZH, LZ: conceived and designed; CL, ZH: administrative support; WO, ZW: collection and assembly of data; ZH, LZ: data analysis and interpretation; LZ: manuscript writing; All authors: final approval of the manuscript.

Acknowledgements

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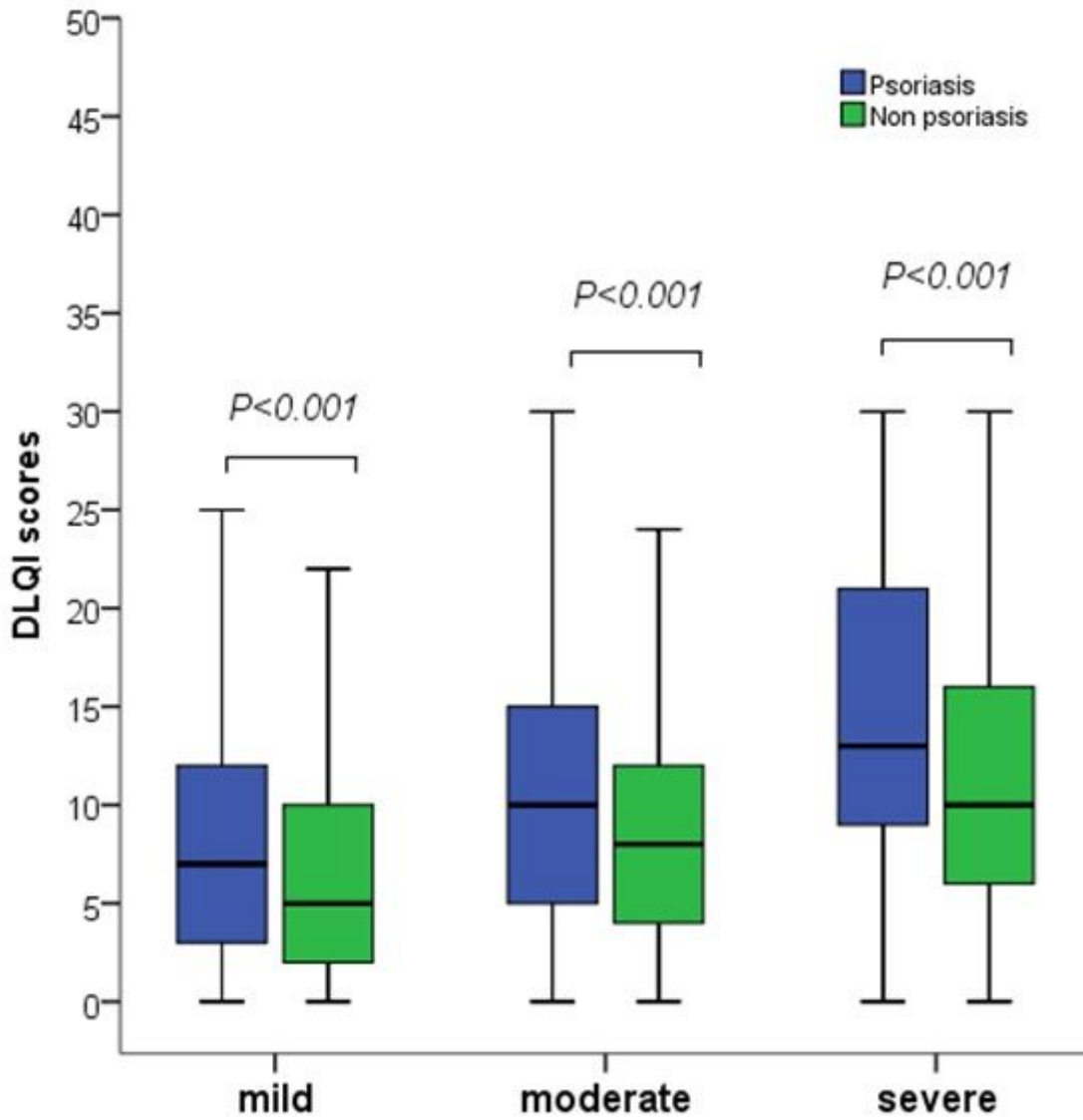
Figures

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Figure 1

DLQI score distribution by severity

Supplementary Files

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