DERMATOLOGICA SINICA 33 (2015) 146–150

Contents lists available at ScienceDirect

Dermatologica Sinica

journal homepage: http://www.derm-sinica.com

ORIGINAL ARTICLE

Impact of psoriasis on quality of life in Taiwan

Hui-Ju Yang[*], Kuo-Chia Yang

Department of Dermatology, Changhua Christian Hospital, Changhua City, Changhua County 500, Taiwan

ARTICLE INFO

Article history:
Received: Jun 30, 2014
Revised: Feb 5, 2015
Accepted: Feb 7, 2015

Keywords:
psoriasis
quality of life

ABSTRACT

Background/Objective: Psoriasis, a disturbing dermatological disorder, often results in ongoing disease and disability. However, relatively little has been published quantifying the quality of life (QoL) of patients with psoriasis in Taiwan. This study was conducted to investigate the impact of psoriasis on the QoL of patients and to explore determinant factors.

Methods: A total of 200 patients, 100 patients with psoriasis and 100 patients with general skin diseases, were asked to fulfill a QoL questionnaire modified from Skindex-16 to include an additional five items pertaining to occupational impact. The clinical data were collected and the severity of psoriasis was evaluated with the Psoriasis Area and Severity Index score. The data were examined to ascertain factors that impact the QoL in patients with psoriasis.

Results: Compared with patients with common skin disorders, patients with psoriasis experienced a deterioration of their QoL in the aspects of symptoms, emotions, daily life function and occupational scales. After further analysis, we noted that neither the severity of disease, duration of disease, age of patients, sex, educational level of patients, nor family history is the determinant factor that worsens their QoL. Instead, the site of the lesions, especially those on exposed areas including hand and facial involvement, has a tremendous impact on their QoL.

Conclusion: Psoriasis has an appreciable effect on QoL, especially when it affects the hands and face. Of the four scales included in our study, the daily life function and occupational scales revealed the greatest effect. The sense of stigma may be the key factor that results in this outcome. To improve the QoL and therapeutic effects, a team needs to be constructed which includes dermatologists, psychologists, social workers, and help from the government is needed to accomplish the task.

Introduction

Several skin disorders can affect quality of life (QoL).[1] Skin disease results in strong negative emotions, annoying symptoms, and the lack of social and occupational abilities. The skin not only provides thermal and physical protection, but also represents our physical appearance; defective skin often results in low self-esteem.[2] The effects of different skin diseases on patients vary and are not always directly proportional to the severity of the disease.[3] The extent to which skin diseases affect the QoL of patients depends on many factors such as the nature of the disease, the duration of the disease, and the site of involvement. Over the past decade, issues related to the QoL of patients with skin diseases are gradually being taken more seriously, and scholars have tried to use various methods to evaluate QoL.[4–7]

Psoriasis is not a rare skin disease, with a prevalence of approximately 1–2% in Caucasians and a lower prevalence in Mongolians.[8] Its pathogenesis and progression are not only related to genetic reason, but also emotional stress, drugs, infections, and physical trauma. In addition, conditions such as inflammatory bowel disease and arthritis are related complications of psoriasis. Therefore, this disease may result in poor appearance and impair daily life functions. Furthermore, it cannot be completely cured, which often leads to psychological distress in patients. Emotional stress may also lead to the deterioration of clinical symptoms in patients with psoriasis. Therefore, a vicious cycle is formed, which not only increases stress in patients, but also negatively affects the

---

Conflicts of interest: The authors declare that they have no financial or non-financial conflicts of interest related to the subject matter or materials discussed in this article.

[*] Corresponding author. Department of Dermatology, Changhua Christian Hospital, 135 Nanxiao Street, Changhua City, Changhua County 500, Taiwan.

E-mail address: 149777@cch.org.tw (H.-J. Yang).

http://dx.doi.org/10.1016/j.dsi.2015.02.001

relationship of trust between patients and physicians. Currently, the QoL of patients with psoriasis in Taiwan is not well studied. This aims of this study are to understand the degree of influence of emotional factors on the QoL of patients with psoriasis in Taiwan and to enable dermatologists provide better comprehensive medical care to patients.

Patients and methods

From March 2004 to June 2004, data for 100 patients with psoriasis (mean age 49.5 ± 15.9 years, and mean duration of disease 10.0 ± 9.3 years) and 100 patients with general skin diseases (mean age 28.1 ± 14.9 years, and mean duration of disease 5.4 ± 8.0 years) who were hospitalized or were outpatients at the Department of Dermatology of Changhua Christian Hospital were randomly selected. General skin diseases were defined as all skin diseases except psoriasis, such as allergy, folliculitis, urticaria, and eczema.

All patients agreed to participate in the project and signed an informed consent after the investigators explained the purposes of this study. A total of 200 patients received oral questionnaires which were carried out in Chinese by an interviewer. The interviewer was a dermatologist with a good knowledge of both English and Chinese. The QoL of all included patients was assessed on the basis of these data. The collected data included general personal data as well as detailed records of family history, work patterns, site of involvement, and complications. The severity of psoriasis was quantitatively assessed by physicians using the Psoriasis Area and Severity Index (PASI). With regard to QoL assessment, Skindex-16, which is a reliable QoL scale for skin disease patients, was used.[4] Patients have to respond to 16 subscales initially; these are further subdivided into three dimensions of symptoms, emotions, and life and social functions. In this study, we added occupational function as a fourth dimension; therefore, the questionnaire eventually comprised 21 questions (Table S1). Each question relating to QoL required patients to rate the degree of irritation felt during the past month on a scale of 0 (never bothered) to 100 (always bothered). The higher the score, the more the quality of life is impaired. The scale score is the mean of the patients' responses to the items in the given scale.

Patient data were recorded in Microsoft Excel sheets (Microsoft Corp, Seattle, WA, USA) and analyzed using SPSS 15.0 statistical software (SPSS, Inc., Chicago, IL, USA). The level of statistical significance was set at 5%.

During evaluation of the QoL of patients, the characteristics of each set of data were considered and various statistical methods were used. For the comparison of continuous variables between samples according to a nonparametric hypothesis and in situations with nonnormal distribution or a small sample size, the Mann-Whitney *U* test was used for two independent samples and the Jonckheere-Terpstra test was used to test for ordered differences among classes.

Results

The patients with psoriasis reported severe interference in all aspects of their lives compared with the patients with general skin diseases. The degree of deterioration in the QoL of patients was statistically significant in terms of all the four dimensions ($p < 0.001$; Table 1), namely symptoms (psoriasis: control group 37.0:21.9), emotions (62.6:40.2), life and social functions (42.1:16.6), and occupational function (24.3:5.0). The PASI scores of patients were analyzed to understand the correlation between QoL deterioration and clinical symptom severity; no correlation was observed (Table 1). With regard to the duration of disease, QoL deterioration was unrelated to symptoms, emotions, life and social functions, or occupational function. There were no age-related differences in the degree of influence on QoL (Table 2).

With regard to sex, the degree of influence of symptoms was slightly higher in women than in men (43.3 vs. 34.6); the same trend was observed for the emotions dimension (63.7 vs. 62.2). The opposite was true for the dimensions of life and social functions (women 41.1 vs. men 42.4) and occupational function (women 18.7 vs. men 26.4). However, none of the differences were statistically significant, indicating that sex is not a significant factor affecting the QoL of patients with psoriasis (Table 3).

To evaluate the influence of education on the QoL, the patients were divided into a group that had received an education of high school level or below and a group that had received education at college level or higher. This was done to analyze whether education influences patient acceptance of the disease, QoL improvement, and the ability to receive and search information relating to the disease. The result showed no influence of education on QoL deterioration (Table 4). Similarly, family history of psoriasis had no influence on QoL deterioration (Table 5).

However, patients with disease involving their hands were more depressed (59.1:26.9) and more severely affected in terms of life and social functions (45.3:13.4) and occupational function (27.2:4.0) compared with those with general skin diseases involving their hands (Table 6). Furthermore, although there was no significant difference between patients with general skin diseases and those with psoriasis in terms of symptom severity (38.9:30.6), patients with psoriasis involving their hands worried more about losing their job (29.0) compared with patients with other skin diseases involving their hands (8.5). For psoriasis patients alone, patients with hand involvement were also more depressed (22.8:59.1) and more affected in terms of life and social functions (27.2:45.3) and occupational function (11.0:27.2) compared with those without hand involvement (Table 7).

In the analysis of the influence of disease involving the face, the influence on emotions was higher in patients with facial involvement than in those without (37.2:23.0) in both groups. Furthermore, the patients with psoriasis involving the face were more severely affected than those with general skin diseases involving the face in terms of life and social functions (43.8:15.6) and occupational function (26.9:2.2; Table 8). Taken together, and considering that there is no correlation between QoL and PASI score, the above results indicate that the QoL of patients with psoriasis is more severely affected by the site of involvement, particularly the face and hands, because they generally remain exposed, and not the extent of disease or inflammation. The QoL of patients with hand and face involvement was severely affected, particularly in terms of life, social, and occupational functions, even though there was no significant difference in objective PASI score and subjective symptom severity in these patients.

Discussion

For several years, scholars have agreed that there is a correlation between the development and progression of psoriasis and emotional stress. Furthermore, Hall et al[9] reported that psychological stress may be an important precursor of psoriasis. Gupta et al[10] reported that patients with psoriasis experienced significant emotional deterioration and that more than 5% of patients suffer from depression and have suicidal intentions. Seville[11–13] and Devrimci-Ozguven[14] reported that patients with psoriasis experienced much more severe psychological and emotional stress. In another study on psoriasis, patients believed that their symptoms affected their daily life and emotions; this depression resulted in a vicious cycle and eventually resulted in the worsening of symptoms.[15] This emotional stress also influences the performance of

Table 1 The results of Skindex-16 and the relationship with severity and QoL.

	Control ($n = 100$)		Psoriasis ($n = 100$)				p[b]
	Mean	Median (range)	Mean	Median (range)	PASI		
					R[a]	p	
Age	28.1	22.4 (3.0–82.4)	49.5	49.7 (12.6–79.0)	−0.183	0.072	<0.001
PASI score			11.5	7.9 (0.4–43.7)			
Duration of disease	5.4	2.5 (0.0–45.0)	10.0	6.8 (0.0–42.0)	0.032	0.753	<0.001
Symptoms scale	21.9	13.8 (0.0–97.3)	37.0	35.0 (0.0–90.0)	0.198	0.051	<0.001
Itching	36.2	25.0 (0.0–100.0)	53.2	50.0 (0.0–100.0)	−0.017	0.869	<0.001
Burning/stinging	14.0	0.0 (0.0–100.0)	30.4	20.0 (0.0–100.0)	0.258	0.011	<0.001
Hurting	10.9	0.0 (0.0–95.0)	26.3	10.0 (0.0–100.0)	0.220	0.031	<0.001
Irritated	26.7	10.0 (0.0–100.0)	38.3	40.0 (0.0–100.0)	0.123	0.231	0.023
Emotions scale	40.2	40.7 (0.0–99.3)	62.6	64.3 (0.0–100.0)	0.179	0.080	<0.001
Persistence/recurrence	42.5	40.0 (0.0–100.0)	70.0	80.0 (0.0–100.0)	0.050	0.630	<0.001
Worry	55.9	70.0 (0.0–100.0)	72.6	95.0 (0.0–100.0)	0.027	0.790	<0.001
Appearance	52.5	50.0 (0.0–100.0)	70.3	90.0 (0.0–100.0)	0.047	0.647	<0.001
Frustration	36.0	30.0 (0.0–100.0)	57.4	50.0 (0.0–100.0)	0.230	0.023	<0.001
Embarrassment	38.1	30.0 (0.0–100.0)	61.5	60.0 (0.0–100.0)	0.181	0.077	<0.001
Annoyed	28.9	10.0 (0.0–100.0)	53.9	50.0 (0.0–100.0)	0.189	0.064	<0.001
Depressed	27.3	10.0 (0.0–100.0)	52.6	50.0 (0.0–100.0)	0.214	0.036	<0.001
Functioning scale	16.6	8.0 (0.0–96.0)	42.1	40.0 (0.0–100.0)	0.149	0.144	<0.001
Interactions with others	20.3	0.0 (0.0–100.0)	48.7	50.0 (0.0–100.0)	0.103	0.318	<0.001
Desire to be with people	10.9	0.0 (0.0–100.0)	39.3	40.0 (0.0–100.0)	0.243	0.016	<0.001
Show affection	8.1	0.0 (0.0–90.0)	36.0	50.0 (0.0–100.0)	0.123	0.231	<0.001
Daily activities	23.0	7.5 (0.0–100.0)	41.9	50.0 (0.0–100.0)	0.034	0.742	<0.001
Work/What you enjoy	21.0	0.0 (0.0–100.0)	44.4	50.0 (0.0–100.0)	0.088	0.390	<0.001
Occupational scale	5.0	0.0 (0.0–94.0)	24.3	10.0 (0.0–100.0)	0.165	0.107	<0.001
May need to leave job	6.6	0.0 (0.0–100.0)	26.6	0.0 (0.0–100.0)	0.142	0.165	<0.001
Fear of being fired	4.7	0.0 (0.0–100.0)	20.5	0.0 (0.0–100.0)	0.058	0.571	<0.001
Financial future	4.1	0.0 (0.0–80.0)	26.1	0.0 (0.0–100.0)	0.146	0.153	<0.001
Interactions with co-workers	4.6	0.0 (0.0–90.0)	26.3	0.0 (0.0–100.0)	0.150	0.141	<0.001
Difficulty using hands	5.1	0.0 (0.0–100.0)	21.9	0.0 (0.0–100.0)	0.207	0.042	<0.001

N = number of patients; SD = standard deviation.

[a] Pearson Correlation Coefficient

[b] p value by Mann-Whitney U test.

Table 2 Correlation of QoL with age in patients with psoriasis.

	Age										p[a]
	<20 ($n = 3$)		20–39 ($n = 25$)		40–59 ($n = 41$)		60–79 ($n = 31$)		Total ($n = 100$)		
	Mean	Median (range)	Mean	Median (range)	Mean	Median (range)	Mean	Median (range)	Mean	Median (range)	
Symptoms scale	19.2	16.9 (12.6–17.7)	37.7	31.2 (21.8–39.9)	39.9	49.0 (40.0–59.3)	34.4	66.9 (60.0–79)	37.0	49.7 (12.6–79.0)	0.706
Emotions scale	64.3	20.0 (12.5–25.0)	70.5	42.5 (2.5–70.0)	63.2	35.0 (2.5–87.5)	55.3	27.5 (0.0–90.0)	62.6	35.0 (0.0–90.0)	0.028
Functioning scale	12.7	64.3 (50.0–78.6)	45.7	82.9 (0.0–100.0)	42.9	64.3 (1.4–100.0)	40.8	58.6 (2.9–97.1)	42.1	64.3 (0.0–100.0)	> 0.99
Occupational scale	23.3	10.0 (0.0–28.0)	23.0	40.0 (4.0–96.0)	27.4	40.0 (0.0–100.0)	21.2	48.0 (0..0–100.0)	24.3	40.0 (0.0–100.0)	0.452

[a] The p values were obtained using the Jonckheere-Terpstra test.

drugs and phototherapy.[16] Therefore, dermatologists should have considerable knowledge about the different degrees of emotions experienced by each individual patient and the associated factors in order to provide the most appropriate treatment.

In this study, the QoL of patients in all aspects of daily life was more severely affected in patients with psoriasis than in those with general skin diseases. However, there was no correlation between clinical symptom severity and the extent of QoL deterioration, which was consistent with the findings of Fortune et al.[15] Furthermore, disease duration was not correlated with QoL deterioration in terms of symptoms, emotions, life and social functions, and occupational function, a finding consistent with that of Akay et al.[17] We also found that age had no influence on the degree of QoL deterioration. These findings indicate that after the onset of

Table 3 Correlation of QoL with sex in patients with psoriasis.

	Sex				p[a]
	Male ($n = 72$)		Female ($n = 28$)		
	Mean	Median (range)	Mean	Median (range)	
Symptoms scale	34.6	29.4 (0.0–87.5)	43.3	45.0 (5.0–90.0)	0.063
Emotions scale	62.2	63.6 (2.9–100.0)	63.7	68.6 (0.0–100.0)	0.645
Functioning scale	42.2	40.0 (0.0–100.0)	41.1	35.0 (0.0–100.0)	0.854
Occupational scale	26.4	10.0 (0.0–100.0)	18.7	4.0 (0.0–74.0)	0.283

[a] The p values were obtained using the Mann-Whitney U test.

Table 4 Correlation of QoL with educational level in patients with psoriasis.

	Education				p[a]
	High school level or below ($n = 82$)		College level or higher ($n = 18$)		
	Mean	Median (range)	Mean	Median (range)	
Symptoms scale	37.2	36.3 (0.0–90.0)	36.1	31.3 (7.5–86.3)	0.893
Emotions scale	62.6	64.3 (0.0–100.0)	62.9	68.6 (25.7–97.1)	0.858
Functioning scale	42.4	40.0 (0.0–100.0)	40.7	32.0 (0.0–88.0)	0.833
Occupational scale	25.3	10.0 (0.0–100.0)	19.4	7.0 (0.0–100.0)	0.582

[a] The p values were obtained using the Mann-Whitney U test.

Table 5 Correlation of QoL with family history in patients with psoriasis.

	Family history of psoriasis				p[a]
	No ($n = 84$)		Yes ($n = 16$)		
	Mean	Median (range)	Mean	Median (range)	
Age	50.7	50.5 (12.6–79.0)	43.3	43.4 (16.9–65.1)	0.096
PASI score	11.2	7.8 (0.8–43.7)	13.1	9.5 (0.4–42.4)	0.697
Duration of disease (y)	10.0	6.3 (0.0–42.0)	10.0	10.0 (0.0–25.0)	0.500
Symptoms scale	36.2	33.8 (0.0–90.0)	41.2	40.0 (2.5–77.5)	0.392
Emotions scale	62.1	64.3 (0.0–100.0)	65.4	72.9 (14.3–98.6)	0.550
Functioning scale	42.4	40.0 (0.0–100.0)	40.5	35.0 (0.0–100.0)	0.735
Occupational scale	24.0	8.0 (0.0–100.0)	25.6	15.0 (0.0–100.0)	0.522

[a] The p values were obtained using the Mann-Whitney U test.

psoriasis, the patient's life will be significantly affected in all aspects; progression or amelioration of the disease will not be influenced by age or disease duration. They also indicate that patients suffer from considerable psychological pressure from disease onset and that their treatment process does not include any measures to relieve this stress. Education level, sex, and family history also did not exhibit any correlation with QoL deterioration, indicating the lack of relevant education, psychological counseling, and social assistance from medical and social resources in Taiwan. The QoL of patients thus remains poor because of the lack of subjective resources, although objective measures such as the provision of external information, self-psychological adjustments, and family counseling are provided.

Table 6 Comparison of QoL with hand involvement between the psoriatic and the control groups.

	Hand involvement				p[a]
	Control ($n = 26$)		Psoriasis ($n = 82$)		
	Mean	Median (range)	Mean	Median (range)	
Symptoms scale	30.6	25.0 (0.0–97.3)	38.9	38.8 (0.0–90.0)	0.095
Hurting	18.3	0.0 (0.0–95.0)	29.3	20.0 (0.0–100.0)	0.051
Emotions scale	38.5	44.3 (0.0–99.3)	64.6	67.9 (0.0–100.0)	<0.001
Frustration	30.6	15.0 (0.0–100.0)	61.3	70.0 (0.0–100.0)	<0.001
Depressed	26.9	5.0 (0.0–100.0)	59.1	50.0 (0.0–100.0)	<0.001
Functioning scale	13.4	11.0 (0.0–44.0)	45.3	44.0 (0.0–100.0)	<0.001
Desire to be with people	3.1	0.0 (0.0–50.0)	44.0	50.0 (0.0–100.0)	<0.001
Daily activities	28.5	15.0 (0.0–90.0)	45.6	50.0 (0.0–100.0)	0.047
Occupational scale	4.0	0.0 (0.0–26.0)	27.2	17.0 (0.0–100.0)	<0.001
May need to leave job	8.5	0.0 (0.0–100.0)	29.0	0.0 (0.0–100.0)	0.008
Fear of being fired	0.0	0.0 (0.0–0.0)	23.5	0.0 (0.0–100.0)	0.001
Difficulty using hands	7.7	0.0 (0.0–50.0)	25.4	0.0 (0.0–100.0)	0.030

[a] The p values were obtained using the Mann-Whitney U test.

Table 7 Comparison of QoL in psoriasis patients with and without hand involvement.

Psoriasis	Hand involvement				p[a]
	No ($n = 18$)		Yes ($n = 82$)		
	Mean	Median (range)	Mean	Median (range)	
Age	54.1	54.7 (17.7–76.0)	48.5	47.6 (12.6–79.0)	0.118
PASI score	7.9	5.3 (1.0–30.4)	12.4	9.0 (0.4–43.7)	0.024
Duration of disease	11.3	4.8 (0.0–40.0)	9.7	7.0 (0.0–42.0)	0.568
Symptoms scale	28.3	22.5 (5.0–86.3)	38.9	38.8 (0.0–90.0)	0.077
Itching	53.6	50.0 (0.0–100.0)	53.0	50.0 (0.0–100.0)	0.945
Burning/stinging	18.3	0.0 (0.0–100.0)	33.0	30.0 (0.0–100.0)	0.052
Hurting	12.2	0.0 (0.0–80.0)	29.3	20.0 (0.0–100.0)	0.024
Irritated	28.9	5.0 (0.0–100.0)	40.4	45.0 (0.0–100.0)	0.185
Emotions scale	53.4	50.7 (2.9–97.1)	64.6	67.9 (0.0–100.0)	0.102
Persistence/recurrence	73.3	85.0 (0.0–100.0)	69.3	80.0 (0.0–100.0)	0.439
Worry	71.7	100.0 (0.0–100.0)	72.8	90.0 (0.0–100.0)	0.882
Appearance	68.3	90.0 (0.0–100.0)	70.7	90.0 (0.0–100.0)	0.981
Frustration	39.4	50.0 (0.0–100.0)	61.3	70.0 (0.0–100.0)	0.017
Embarrassment	53.8	50.0 (0.0–100.0)	63.2	65.0 (0.0–100.0)	0.424
Annoyed	44.4	50.0 (0.0–100.0)	56.0	50.0 (0.0–100.0)	0.208
Depressed	22.8	0.0 (0.0–100.0)	59.1	50.0 (0.0–100.0)	0.000
Functioning scale	27.2	20.0 (0.0–74.0)	45.3	44.0 (0.0–100.0)	0.018
Interactions with others	30.6	10.0 (0.0–100.0)	52.7	50.0 (0.0–100.0)	0.050
Desire to be with people	17.8	0.0 (0.0–70.0)	44.0	50.0 (0.0–100.0)	0.009
Show affection	24.4	10.0 (0.0–100.0)	38.5	50.0 (0.0–100.0)	0.181
Daily activities	25.0	5.0 (0.0–80.0)	45.6	50.0 (0.0–100.0)	0.032
Work/What you enjoy	38.3	40.0 (0.0–100.0)	45.7	50.0 (0.0–100.0)	0.468
Occupational scale	11.0	0.0 (0.0–64.0)	27.2	17.0 (0.0–100.0)	0.024
May need to leave job	15.6	0.0 (0.0–80.0)	29.0	0.0 (0.0–100.0)	0.243
Fear of being fired	6.7	0.0 (0.0–70.0)	23.5	0.0 (0.0–100.0)	0.044
Financial future	15.0	0.0 (0.0–70.0)	28.5	0.0 (0.0–100.0)	0.144
Interactions with co-workers	11.7	0.0 (0.0–70.0)	29.5	5.0 (0.0–100.0)	0.060
Difficulty using hands	6.1	0.0 (0.0–50.0)	25.4	0.0 (0.0–100.0)	0.039

[a] The p values were obtained using the Mann-Whitney U test.

The site of involvement was found to be a significant factor influencing QoL deterioration, particularly in patients with disease involving routinely exposed parts that cannot be covered, such as the face and hands. Ginsburg et al[18] reported that patients with psoriasis tend to consider their disease as a social stigma, are more sensitive, often think that that they have flaws, feel shameful, guilty, and isolated, and shy away from participation in group activities.[19] This theory is supported by our research results. In the study by Kadyk et al[20] on the QoL in patients with allergic contact dermatitis, patients with atopic dermatitis, compared with patients without atopic dermatitis, patients with atopy had a better QoL. Although they had more severe symptoms or allergies in other body parts or systems, they were significantly less worried about losing jobs because of hand disease. This is because atopic dermatitis is widely recognized by the general public, because the relevant medical and health education resources are very rich, and because patients as well as normal individuals have a considerable degree of knowledge and recognition of this disease. Therefore, patients with atopic dermatitis accept their illness more easily and can explain their situation to others; this ameliorates anxiety and the feeling of being a social stigma and isolation from society and results in a better QoL. On the other hand, patients with psoriasis continuously feel frustrated and have a poor QoL because of the significant lack of relevant medical and health education resources available to them, their families, and the general public. Therefore, measures to strengthen the relevant medical and health education resources should be implemented to resolve the current situation.

The main limitation of this study is that the Chinese version of the questionnaire adopted in this study has not been proved as a reliable and valid measure of skin disease on the quality of life in Taiwanese/Chinese patients. Nonetheless, the interviewer who was a dermatologist proficient in Chinese and English did his best efforts to explain in detail the contents of the questionnaire during the interview process to assist the patients in understanding and filling out the questionnaires. Besides, the He et al study shows that

Table 8 Comparison of QoL with face involvement between the psoriatic and the control groups.

	Face involvement				p[a]
	Control ($n = 49$)		Psoriasis ($n = 79$)		
	Mean	Median (range)	Mean	Median (range)	
Symptoms scale	23.0	15.0 (0.0–97.3)	37.2	37.5 (0.0–87.5)	<0.001
Emotions scale	44.0	45.7 (0.0–99.3)	66.1	68.6 (0.0–100.0)	<0.001
Functioning scale	15.6	8.0 (0.0–70.0)	43.8	40.0 (0.0–100.0)	<0.001
Occupational scale	2.2	0.0 (0.0–28.0)	26.9	14.0 (0.0–100.0)	<0.001

[a] The p values were obtained using the Mann-Whitney U test.

the Skindex-16 questionnaire is suitable for measuring the quality of life in Chinese patients with skin diseases.[21]

Conclusion

Psoriasis has been proved to be an emotional stress-related illness. There is a close relationship between the disease and stress, which results in a vicious cycle. This means that psoriasis will be induced by emotional stress, which in turn will cause further deterioration of symptoms and poor treatment outcomes. To achieve the ideal treatment outcome, it is important to understand the factors that emotionally disturb the patient and provide measures to relieve these emotions. In this study, a key factor that affected the QoL of patients was the site of involvement, particularly the face and hands because they cannot be covered, and not the severity or duration of disease, age, sex, family history, or education level. The proportion of patients that are frustrated, afraid to interact with others, and extremely worried about losing their job because of their disease has seen a dramatic increase, probably because the management of these patients focuses only on pharmacological therapy and does not include self-understanding and psychological counseling. No relief or sense of security is provided by the social welfare department, and no health education is provided by social education units to the general public. All these factors result in patient isolation and poor QoL. To achieve better clinical treatment outcomes and enable all patients to receive treatment that will benefit them in all aspects and lead a satisfactory life, a multidisciplinary approach by dermatologists, psychiatrists, social workers, social education units, and medical teams of government welfare departments is required.

Acknowledgments

We gratefully acknowledge the assistance of Dr Ming-I Tseng and Yu-Fen Wang with the draft and data analysis.

References

1. Finlay AY, Khan GK. Dermatology Life Quality Index (DLQI)—a simple practical measure for routine clinical use. *J Clin Exp Dermatol* 1994;**19**:210–6.
2. Zachariae R, Zachariae C, Ibsen HHW, Mortensen JT, Wulf HC. Psychological symptoms and quality of life of dermatology outpatients and hospitalized dermatology patients. *Acta Derm Venereol* 2004;**84**:205–12.
3. Zachariae R, Zachariae H, Blomqvist K, et al. Quality of life in 6497 Nordic patients with psoriasis. *Br J Dermatol* 2002;**146**:1006–16.
4. Chren MM, Lasek RJ, Sahay AP, Sands LP. Measurement properties of Skindex-16: a brief quality-of-life measure for patients with skin diseases. *J Cutan Med Surg* 2001;**5**:105–10.
5. Morgan M, McCreedy R, Simpson J, Hay RJ. Dermatology quality of life scales – a measure of the impact of skin diseases. *Br J Dermatol* 1997;**136**:202–6.
6. Both H, Essink-Bot ML, Busschbach J, Nijsten T. Critical review of generic and dermatology-specific health-related quality of life instruments. *J Invest Dermatol* 2007;**127**:2726–39.
7. Basra MKA, Fenech R, Gatt RM, Salek MS, Finlay AY. The dermatology life quality index 1994–2007: a comprehensive review of validation data and clinical results. *Br J Dermatol* 2008;**159**:997–1035.
8. Kawada A, Tezuka T, Nakamizo Y, et al. A survey of psoriasis patients in Japan from 1982 to 2001. *J Dermatol Sci* 2003;**31**:59–64.
9. Hall JMF, Cruser D, Podawiltz A, et al. Psychological stress and the cutaneous immune response: roles of the HPA axis and the sympathetic nervous system in atopic dermatitis and psoriasis. *Dermatol Res Pract* 2012;**2012**. Article ID 403908, 11 pages. http://dx.doi.org/10.1155/2012/403908.
10. Gupta MA, Schork NJ, Gupta AK, Kirkby S, Ellis CN. Suicidal ideation in psoriasis. *Int J Dermatol* 1993;**32**:188–90.
11. Seville RH. Psoriasis and stress. *Br J Dermatol* 1977;**97**:297–302.
12. Seville RH. Psoriasis and stress II. *Br J Dermatol* 1978;**98**:151–3.
13. Seville RH. Stress and psoriasis: the importance of insight and empathy in prognosis. *J Am Acad Dermatol* 1989;**20**:97–100.
14. Devrimci-Ozguven H, Kundakci N, Kumbasar H, Boyvat A. The depression, anxiety, life satisfaction and affective expression levels in psoriasis patients. *J Eur Acad Dermatol Venereol* 2000;**14**:267–71.
15. Fortune DG, Richards HL, Main CJ, et al. What patients with psoriasis believe about their condition. *J Am Acad Dermatol* 1998;**39**:196–201.
16. Kabat-Zinn J, Wheeler E, Light T, et al. Influence of a mindfulness meditation-based stress reduction intervention on rates of skin clearing in patients with moderate to severe psoriasis undergoing phototherapy (UVB) and photochemotherapy (PUVA). *Psychosom Med* 1998;**60**:625–32.
17. Akay A, Pekcanlar A, Bozdag KE, Altintas L, Karaman A. Assessment of depression in subjects with psoriasis vulgaris and lichen planus. *J Eur Acad Dermatol Venereol* 2002;**16**:347–52.
18. Ginsburg IH, Link BG. Feelings of stigmatization in patients with psoriasis. *J Am Acad Dermatol* 1989;**20**:53–63.
19. Hrehorow E, Salomon J, Matusiak L, Reich A, Szepietowski JC. Patients with psoriasis feel stigmatized. *Acta Derm Venereol* 2012;**92**:67–72.
20. Kadyk DL, McCarter K, Achen F, Belsito DV. Quality of life in patients with allergic contact dermatitis. *J Am Acad Dermatol* 2003;**49**:1037–48.
21. He Z, Lu C, Chren M, et al. Development and psychometric validation of the Chinese version of Skindex-29 and Skindex-16. *Health Qual Life Outcomes* 2014 Dec 24;**12**(1):4 [Epub ahead of print.].

Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.dsi.2015.02.001.