ORIGINAL ARTICLE

Impact of Psoriasis on Quality of Life of Family Members and Its Association with Anxiety and Depression

Siu Bee Wong, *MRCP*, Teeba Raja, *AdvMDerm*, Tze Yuen Teoh, *AdvMDerm*
Department of Dermatology, Selayang Hospital, Ministry of Health, Malaysia

Abstract

Background

Psoriasis is a chronic immune-mediated, multisystem inflammatory skin disease that can profoundly impact the quality of life (QoL) of both patients and their families. This study aimed to analyse the impact of psoriasis on the QoL of patients' family members and its association with anxiety and depression.

Methods

This was a cross-sectional study which had a total of 240 subjects (80 patients, 80 family members, and 80 healthy controls). The Dermatology Life Quality Index (DLQI) questionnaire was used to evaluate the QoL of patients, and the Family Dermatology Life Quality Index (FDLQI) questionnaire was used to assess the QoL of family members. In addition, the Hospital Anxiety and Depression Scale (HADS) was used to evaluate the state of anxiety or depression of all subjects, including the healthy controls.

Results

Up to 82.5% of family members of psoriasis patients had impaired QoL (FDLQI ≥2). The mean DLQI was 8.89±7.58, whereas the mean FDLQI scores was 7.58±6.09, showing the considerable impact of psoriasis on both patients and family members' quality of life. There was a positive correlation between family members' QoL with patients' anxiety (r_s=0.348; p=0.002) and depression (r_s=0.276; p=0.013) level. However, no association was found between family members' QoL with patients' psoriasis severity (r_s=0.173; p=0.126) and the DLQI scores (r_s=0.137; p=0.224). Based on the HADS, the mean anxiety scores was 5.29±4.07 and the mean depression scores was 4.54±4.20 for family members. An anxiety disorder was suggested in 32.5%, while depression was suggested in 23.8% of family members.

Conclusion

Psoriasis has a significant impact on both patients and their family members, who experienced impairment of their QoL and higher levels of anxiety and depression.

Key words: *DLQI; FDLQI; HADS; psoriasis; quality of life*

Introduction

Psoriasis is a chronic, immune-mediated, multisystem inflammatory disease with variable prevalence among populations, affecting between 0.5 to 11.4 percent among adults.[1-3] It is characterised by well-demarcated erythematous and scaly papules and plaques that are usually accompanied by burning sensation, pain and itching. Patients with disfiguring psoriasis plaques over visible or

Corresponding Author
Dr Wong Siu Bee
Department of Dermatology,
Selayang Hospital,
B21, Lebuhraya Selayang-Kepong,
68100, Batu Caves, Selangor, Malaysia
Email: helensbwong@gmail.com

sensitive areas of the body, may encounter a high level of stigmatisation, social isolation and psychological distress.[4-6] This substantially compromise their social functioning, personal relationship, work, daily activities, and health-related quality of life (QoL), especially in those with moderate-to-severe disease.[7]

Furthermore, the negative impact of psoriasis has been shown to extend beyond the patients into their families. Family members often experience physical and mental exhaustion, social disruption, marital problems and financial implications in their lives due to the chronic nature of psoriasis.[8] Numerous studies have examined the influence of psoriasis on the quality of life and psychosocial health of patients.[9-12] However, the studies that have analysed the secondary impact on individuals living with psoriatic patients are limited.[13-18]

There was a higher level of anxiety and depression among individuals living with psoriatic patients. Research studies had shown that the severity of psoriasis disease was not the main factor that contributed to the mental impairment among family members.[19] Instead, the extent of their psychological distress was mainly related to the level of psychological distress of the patients.[13-14] Family quality of life and psychosocial health is considered an essential factor in patient management and should be analysed additionally to the quality of life of the patients.[13] Nevertheless, clinicians usually overlook this for various reasons, including time limitation and difficulty in assessing it. Data on the impact of psoriasis on the quality of life of their family members in Malaysia was also not well-established, and it has not received much attention yet.

Therefore, this study aimed to analyse the impact of psoriasis on the quality of life of family members of psoriatic patients, to assess the potentially related factors and to explore the impact of psoriasis on family members' mental health.

Materials and Methods

Study Design and Subject Selection

This was a cross-sectional, questionnaire-based study conducted at the dermatology clinic in Selayang Hospital, Malaysia, from June 2020 to January 2021. We analysed three groups: patients with psoriasis, patients' family members, and healthy controls.

Patients

Male and female patients were eligible for this study if they met the following criteria: aged 18 years old and above, could give informed consent and had a clinical diagnosis of plaque psoriasis for at least 6 months. Patients were excluded if they had another dermatological disease, severe medical or psychiatric disorders that might influence their judgment or QoL.

Family members

Family members enrolled in this study were usually first degree relatives aged 18 years old or older, who were the main caregivers and stayed with patients for the past year. Most patients had a single caregiver. However, in the event of multiple caregivers, one of them was randomly selected for the study. Family members with dermatological diseases, severe medical or psychiatric disorders that might influence their judgment or QoL were excluded.

Healthy controls

Controls were healthy subjects with no personal or family history of psoriasis (in a first-degree relative) or other dermatological diseases. Also, they were age-and-sex matched to family members. They were mainly healthcare staffs or their family members. They were excluded if they had other medical illnesses and psychological problems, that might influence their overall psychological health.

Study Procedures

Patients who were clinically diagnosed with plaque psoriasis were approached along with a family member. The detailed information regarding the study was given by the clinical investigators. Eligible patients' medical records were reviewed by investigators to verify the

diagnosis of psoriasis and duration of disease. After consent, each subject's demographics, including age, sex, occupation, marital status, and level of education were gathered and recorded. This step was followed by an assessment of disease severity by using the psoriasis area and severity index (PASI). The impact of psoriasis on the QoL of the patients was determined by using the 10-item Dermatology Life Quality Index (DLQI). The impact of psoriasis on the QoL of family members was measured with the Family Dermatology Life Quality Index (FDLQI). The Hospital Anxiety Depression Scale (HADS) was used to evaluate the state of anxiety or depression of all subjects, including the healthy controls.

Disease Severity Assessment

Psoriasis area and severity index(PASI)

The PASI was used to measure of the physical severity of psoriasis. Skin lesions are graded based on the extent and character of psoriasis (i.e. erythema, induration, and scaling) and provides a severity score ranging from 0 to 72.[20-21] A score of less than 10 suggest mild psoriasis, while 10-20 and >20 indicating moderate psoriasis and severe psoriasis, respectively.

Quality of Life Instruments

Dermatology Life Quality Index (DLQI)

The DLQI is a 10-item questionnaire validated to evaluate the health-related quality of life of adult patients suffering from skin diseases.[22-24] Published in 1994, the DLQI was the first dermatology-specific quality of life questionnaire. This questionnaire asks about the impact of skin disease on symptoms, self-perception, shopping, clothing choice, social activity, physical activity, working/studying, personal relationships, sexual functioning, and treatment. With this questionnaire, patients define how much their skin disease has affected their life, with the scoring for each item ranging from "not at all" to "very much". Each response is scored on a scale from 0 to 3. Then, the numbers are summed to obtain the total score out of 30 points. A greater DLQI score indicates a greater quality of life impairment. Therefore, the DLQI punctuation is interpreted as 0–1=no effect at all; 2–5=small effect; 6–10=moderate effect; 11–20=very large effect; and 21–30=extremely large effect.

Family Dermatology Life Quality Index (FDLQI)

The FDLQI is a dermatology-specific questionnaire designed for the family members of patients with any skin disease.[25] It measures the adverse impact on the health-related QoL of family members. The FDLQI consists of 10 items with possible answers on a 4-point scale: not at all/not applicable, a little, quite a lot, and very much. The items concern the impact of a patient's skin disease on different aspects of the family caregivers' QoL (i.e. emotional and physical wellbeing, relationships, social life, leisure activities, burden of care, impact on job/study, housework, and expenditure). The scores of individual items (0–3) are added to give a total score that ranges from 0 to 30. Higher total FDLQI scores indicate greater impairment of the family member's quality of life and vice versa. FDLQI could be interpreted similarly to DLQI: 0–1=no effect at all; 2–5=small effect; 6–10=moderate effect; 11–20 =very large effect; and 21–30=extremely large effect.

Hospital Anxiety Depression Scale (HADS)

The HADS is a validated instrument for screening of depression and anxiety.[26-27] This questionnaire consists of seven questions in each sub-scale of anxiety and depression. The items are scored on a four-point scale from zero (not present) to three (severe). The item scores are then summed, giving sub-scale scores on the HADS-A and the HADS-D from 0 to 21. A lower score indicates less severity and vice versa. Scores consistent with anxiety or depression are each defined by subscale scores of 8 or greater, and categorised as normal (score of 0-7), mild (score of 8-10), moderate (score of 11-14), and severe (score of 15-21). Several researchers have explored HADS data to establish the cut-off points for caseness of anxiety or depression. For example, Bjelland et al. (2002)[28], through a literature review of a large number of studies, identified a cut-off point of 8/21 for anxiety or depression.

For anxiety (HADS-A), this gave a specificity of 0.78 and a sensitivity of 0.9. For depression (HADS-D), this gave a specificity of 0.79 and a sensitivity of 0.83. Importantly, HADS has been validated for use in a range of different languages and conditions.[28-29] This study utilised both English and translated Malay versions of the original tool. The translated Malay version of HADS showed good sensitivity and specificity (sensitivity 90.0% and specificity 86.2% for anxiety; sensitivity 93.2% and specificity 90.8% for depression) and, therefore, is a valid instrument for use in the Malaysian population.[29]

Study Analysis

Statistical analyses were performed using Statistical Package for Social Sciences version 26 (SPSS, IBM Corporation, Chicago, IL, USA). Descriptive statistics for continuous variables were expressed as mean±standard deviation while categorical variables as frequencies and percentages. Comparisons involving categorical data were performed using the chi-square test. The significance of differences was assessed using independent-samples t-test for continuous data in the univariate analysis when normality and equal variance assumptions were satisfied. One-way analysis of variance (ANOVA) with a post hoc analysis was used to determine significance between three or more groups. Associations between continuous variables were analysed using the Spearman coefficient of rank correlation (r_s). Particularly, the correlation coefficient between 0.1 and 0.25 was considered low, while the value between 0.26 and 0.5 was considered moderate, and those over 0.5 were considered high. A multivariate analysis was carried out using multiple linear regression to determine the independent associated factors of FDLQI. Statistical significance was set at $p<.05$.

Ethical Approval

This study was registered with the National Medical Research Registry (NMRR-19-4047-51235). Ethical approval for the study was obtained from the Medical Research and Ethics Committee, Ministry of Health, Malaysia.

Results

Demographic Characteristics

A total of 240 subjects were enrolled in this study (i.e. 80 patients with psoriasis, 80 family members and 80 healthy controls). The demographic characteristics of study subjects are shown in Table 1. The mean age of patients was 44.09±14.2 years, and 48 patients (60%) were men. Forty-nine patients (61.3%) had mild disease, 23 patients (28.7%) with moderate disease and 8 patients (10%) had severe disease based on PASI scores. Their mean PASI score was 8.18±8.79.

Clinical characteristics of patients with psoriasis are presented in Table 2. More than half of patients had scalp (82.5%) and nails (78.8%) involvement. Thirty-eight (47.5%) patients had joints involvement, and only 6 (7.5%) patients had genital involvement. The mean age of family members was 42.66±12.5, ranging from 20 to 73 years. Twenty-eight (35%) family members were men, and 52 (65%) were women. Most of the family members were married (81.2%), employed (66.3%) and with secondary educational level (61.3%). There were 80 healthy controls, where there were with 27 males and 52 females with a mean age of 43.00±12.69. There were no significant differences among the groups with regard to age (p=0.774) and ethnicity (p=0.109).

DLQI

The mean DLQI score was 8.89±7.58, with a range of 0 to 29 in patients. As shown in Figure 1, a total of 29 (36.3%) patients had a DLQI score of more than 10, indicating psoriasis had a very large to extremely large effect on their QoL. There were 14 (17.5%) psoriatic patients who reported psoriasis had a moderate effect on their QoL, while 25 (31.3%) patients reported psoriasis had a small effect on their quality of life. There was no statistically significant relationship between DLQI and patients' age, sex, ethnicity, marital status, education level, occupation, and disease severity (Table 3). Although the DLQI score was higher in patients with severe disease and those with joints involvement, the difference was not statistically significant (p>0.05).

Table 1. Demographic characteristics of 240 study subjects

Demographic	Patients, n=80	Family members, n=80	Healthy controls, n=80	*p*-value
	Mean±SD or n (%)	Mean±SD or n (%)	Mean±SD or n (%)	
Age (years) Age range	44.09±14.2 (18-78)	42.66±12.5 (20-73)	43.00±12.7 (22-72)	0.774[a]
Sex				
Male	48 (60)	28 (35)	27 (33.8)	**0.001**[b]
Female	32 (40)	52 (65)	53 (66.3)	
Ethnicity				
Malay	45 (56.2)	45 (56.3)	44 (55.0)	0.109[b]
Chinese	23 (28.7)	23 (28.7)	28 (35.0)	
Indian	9 (11.3)	9 (11.3)	7 (8.8)	
Other ethnics minorities	3 (3.75)	3 (3.75)	1 (1.3)	
Marital status				
Single	23 (28.7)	15 (18.8)	36 (45.0)	**0.004**[b]
Married	57 (71.3)	65 (81.2)	43 (53.8)	
Divorced	0 (0)	0 (0)	1 (1.3)	
Education				
Primary	4 (5)	5 (6.3)	2 (2.5)	**<0.001**[b]
Secondary	52 (65)	49 (61.3)	8 (10.0)	
Tertiary	24 (30)	25 (31.3)	70 (87.5)	
Illiterate	0 (0)	1 (1.3)	0 (0)	
Occupation				
Employed	58 (72.5)	53 (66.3)	79 (98.8)	**<0.001**[b]
Unemployed	22 (27.5)	27 (33.8)	1 (1.2)	

[a]ANOVA; [b]*Chi-Square test;* SD: Standard deviation

Table 2. Clinical characteristics of psoriatic patients (*n*=80)

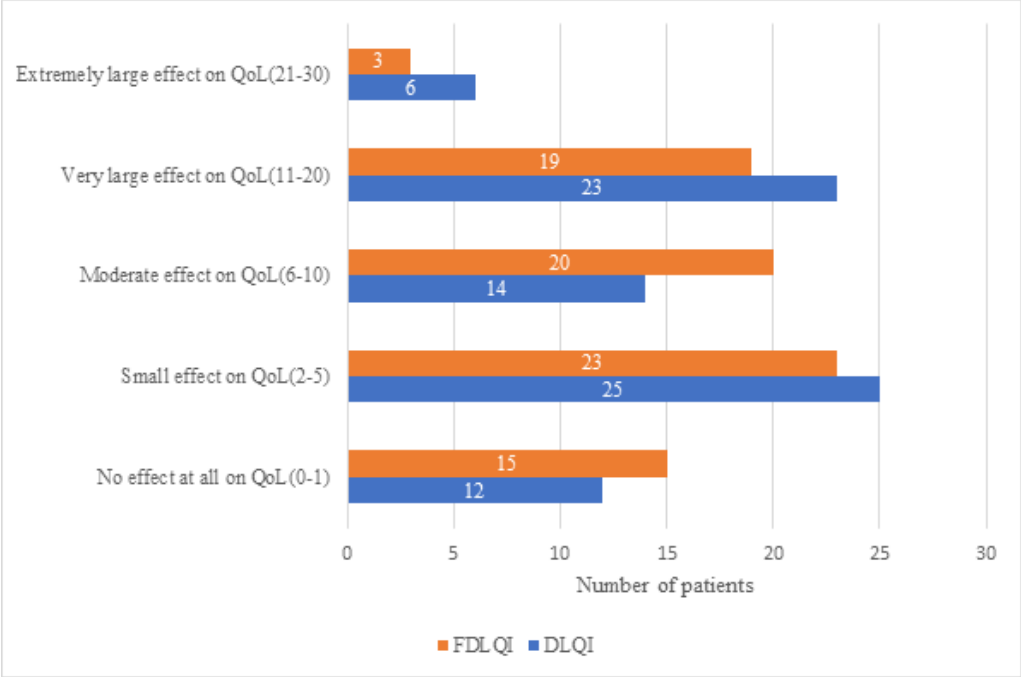
Variables	**Patients, n (%)**
PASI	
Mild (<10)	49 (61.3)
Moderate (10-20)	23 (28.7)
Severe (>20)	8 (10.0)
Scalp involvement	
Yes	66 (82.5)
No	14 (17.5)
Nails involvement	
Yes	63 (78.8)
No	17 (21.2)
Joints involvement	
Yes	38 (47.5)
No	42 (52.5)
Genital involvement	
Yes	6 (7.5)
No	74 (92.5)
Medical comorbidities	
Yes	29 (36.2)
No	51(63.8)

Table 3. DLQI and FDLQI scores related to demographics and clinical parameters

	DLQI	*p-value*	FDLQI	*p-value*
	Mean±SD		Mean±SD	
Means	8.89±7.58		7.58±6.09	
Age(years)				
r_s	0.104	0.359	0.035	0.760
Sex				
Male	9.71±7.37	0.238a	6.82±5.66	0.420a
Female	7.65±7.85		7.98±6.33	
Ethnicity				
Malay	9.31±7.96	0.256b	7.40±6.24	0.978b
Chinese	8.22±7.20		7.96±6.79	
Indian	10.44±7.58		7.22±4.55	
Others	3.00±2.00		8.33±4.04	
Marital status				
Single	10.83±9.02	0.064a	4.07±2.94	<0.001a
Married	8.11±6.85		8.38±6.36	
Education				
Primary	6.75±4.65	0.399b	3.20±2.59	0.051b
Secondary	8.85±7.37		9.00±6.69	
Tertiary	9.33±8.54		5.72±4.44	
Illiterate	-		6.00±0.00	
Occupation				
Employed	8.60±7.14	0.590a	6.92±5.71	0.183a
Non-employed	9.64±8.79		8.85±6.72	
Disease severity				
Mild	8.51±7.52	0.369b	6.86±6.46	0.301b
Moderate	8.43±6.94		8.14±4.71	
Severe	12.50±9.62		10.11±6.85	
Scalp involvement				
Yes	8.89±7.61	1.000a	7.85±6.04	0.268a
No	8.89±7.79		5.44±6.44	
Nail involvement				
Yes	8.40±7.40	0.268a	8.17±6.03	0.090a
No	10.71±8.23		5.35±5.98	
Joint involvement				
Yes	7.92±6.41	0.281a	7.38±5.48	0.771a
No	9.76±8.48		7.78±6.72	
Genital involvement				
Yes	10.50±6.47	0.591a	9.17±6.11	0.509a
No	8.76±7.69		7.45±6.11	

[a]Independent T-test; [b]ANOVA; r_s: Spearman coefficient of rank correlation; SD: standard deviation

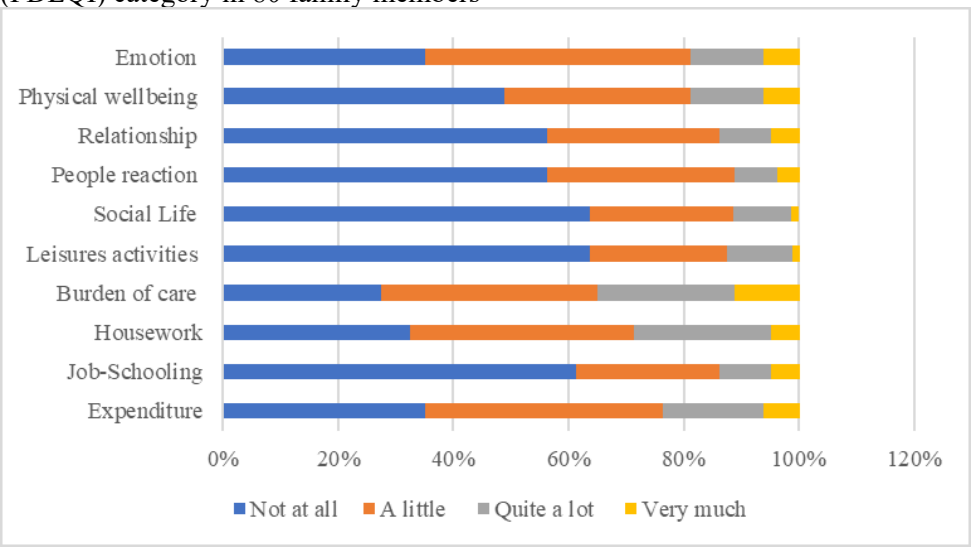
Figure 1. Quality of life impairment among patients and family members based on DLQI and FDLQI scores



FDLQI

Up to 82.5% of family members of psoriasis patients had impaired QoL(FDLQI ≥2). A total of 42 (52.5%) family members reported an FDLQI score of>6, indicating moderate to severe QoL impairment as a result of psoriasis (Figure 1). The mean FDLQI score of the family members was 7.58±6.09, and it ranged from minimal score 0 to a maximum score of 27. We compared FDLQI scores with demographics and clinical parameters (Table 3). Married family members were more affected than those who were single (8.38±6.36 vs. 4.07±2.94; *p< 0.001*). There was no statistically significant correlation between FDLQI scores with family members' age, sex, ethnicity, education level, and occupation. The presence of nails, scalp or genital psoriasis in patients did not significantly affect the mean FDLQI scores of family members (*p>0.05)*. As shown in Figure 2, family members' QoL was most highly affected in the aspect of emotion, the burden of care, housework and extra household expenditure. Social life and leisure activities were the aspect of life that was least affected by psoriasis.

Figure 2. Degree of impairment by psoriasis to quality of life based on Family Dermatology Life Quality Index (FDLQI) category in 80 family members



The FDLQI scores of family members did not show statistical correlation with DLQI scores (r_s=0.137; p=0.224) and psoriasis disease severity (r_s=0.173; p=0.126), as shown in Table 4. However, there was a positive correlation between FDLQI scores with patients' anxiety (r_s=0.348; p=0.002) and depression (r_s=0.276; p=0.013) level. Family members' QoL was strongly correlated with their anxiety and depression level (r_s=0.505; p<0.001 and r_s=0.420; p<0.001, respectively) as shown in Table 4 and Figure 3. The mean FDLQI scores was higher among family members with moderate to severe anxiety and depressive symptoms.

Table 4. Correlation between clinical features and Family Dermatology Life Quality Index (FDLQI) scores in family members

	FDLQI scores	
DLQI	r_s=0.137	p=0.224
Disease severity(PASI)	r_s=0.173	p=0.126
Patients' anxiety	r_s=0.348	**p=0.002**
Patients' depression	r_s=0.276	**p=0.013**
Family members' anxiety	r_s=0.505	**p<0.001**
Family members' depression	r_s=0.420	**p<0.001**

Multivariate linear regression revealed an association between family members' anxiety and FDLQI scores, regardless of their age, sex, educational level, occupation, and depression level and the PASI and DLQI scores of the patients (standardised ß=0.453; p=0.001).

Table 5. Multiple linear regression analysis of independent predictors associated with Family Dermatology Life Quality Index*

Predictors	Unstandardised B	Standardised Coefficients Beta	t	p-value
Patient's variables				
DLQI	0.051	0.063	0.641	0.523
PASI	1.041	0.118	1.214	0.229
Family member's variables				
Age	-0.029	-0.061	-0.593	0.555
Sex	0.283	0.022	0.213	0.832
Educational level	0.408	0.040	0.372	0.711
Occupation	1.101	0.087	0.775	0.441
Anxiety level	0.674	0.453	3.334	**0.001**
Depression level	0.207	0.143	1.013	0.315
Constant			-0.102	0.919

*Dependent variable: Family Dermatology Life Quality Index, Adjusted R square=0.279 (p=0.001)

Figure 3. Mean FDLQI scores with different anxiety and depression levels in family members (n=80)

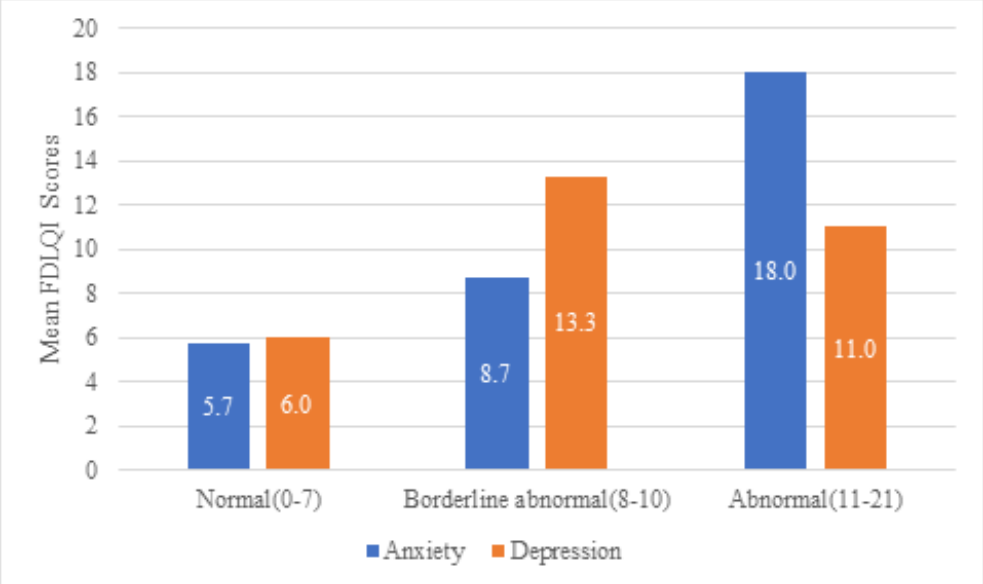
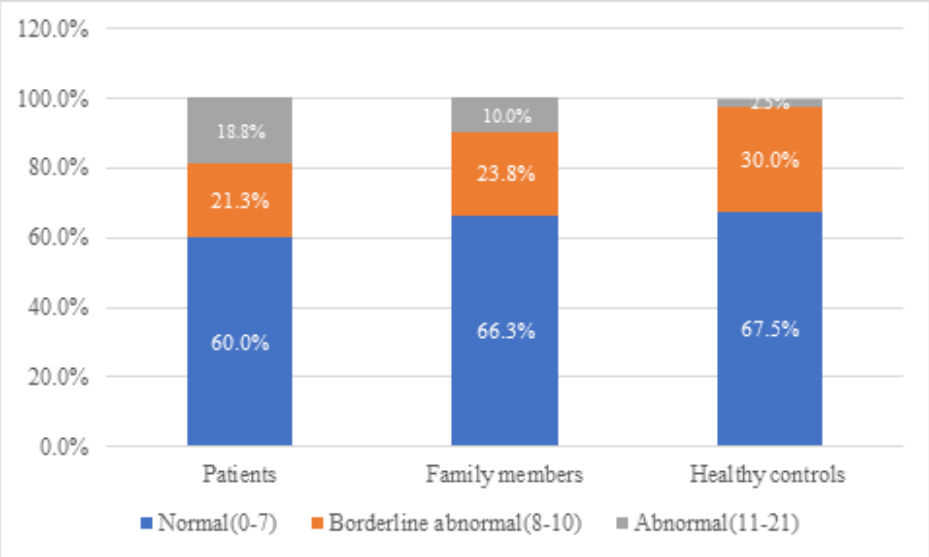


Table 6. Comparison of anxiety and depression among psoriasis patients, their family members and healthy controls (n =240)

Variables	Subjects	Significant case *n (%)*[a]	Mean±SD	*p*-value	Mean difference (95% CI)
HADS-A	Patients	32 (40.1)	6.25±4.18	**0.041**	1.46 (0.02, 2.90)*
	Family members	27 (33.8)	5.29±4.07		0.50 (-0.94,1.94)*
	Controls	26 (32.5)	4.79±2.95		
HADS-D	Patients	29 (36.3)	5.45±3.94	**0.025**	1.50 (0.09, 2.91) †
	Family members	19 (23.8)	4.54±4.20		0.59 (-0.83,2.00)†
	Controls	12 (15.0)	3.93±2.87		

[a]Significant case means a score of 8–21 for each subscale of HADS
p-value generated using the ANOVA test
*Post-hoc analysis: Bonferroni test was applied. A significant difference ($p< 0.05$) was found between patients vs controls ($p= 0.045$), no significant difference was found between patients vs family members ($p= 0.324$) and family members vs controls ($p= 1.000$)
†Post-hoc analysis: Bonferroni test was applied. A significant difference was found between patients vs controls ($p= 0.034$); no significant difference was found between patients vs family members ($p=0.363$) and family members vs controls ($p= 0.953$)
SD: Standard deviation

Figure 4. Bifurcation of subjects as normal, borderline abnormal or abnormal cases of anxiety in patients, family members and healthy controls (n=240)



Anxiety

The mean HADS anxiety scores (HADS-A) was 6.25±4.18 for patients, 5.29±4.07 for family members, and 4.79±2.95 for healthy controls, with significant differences (p=0.041) being detected among the groups (Table 5). Patients and family members had similar anxiety levels (p=0.324) and patients' anxiety level was significantly higher than the healthy controls (6.25 vs 4.79; p=0.045). However, no significant difference was found between the anxiety level of family members and healthy controls based on post-hoc analysis (p=1.000).

Thirty-two (40.1%) of the psoriatic patients had a HADS-A score ≥ 8, whereas 27 (33.8%) of the family members had a HADS-A score ≥8, which is suggestive of anxiety disorder, as shown in Figure 4. Even though 26 (32.5%) healthy controls reported anxiety symptoms, but most of them only had mild symptoms (n=24).

Figure 5. Bifurcation of subjects as normal, borderline abnormal or abnormal cases, for depression in patients, family members and healthy controls (n=240)

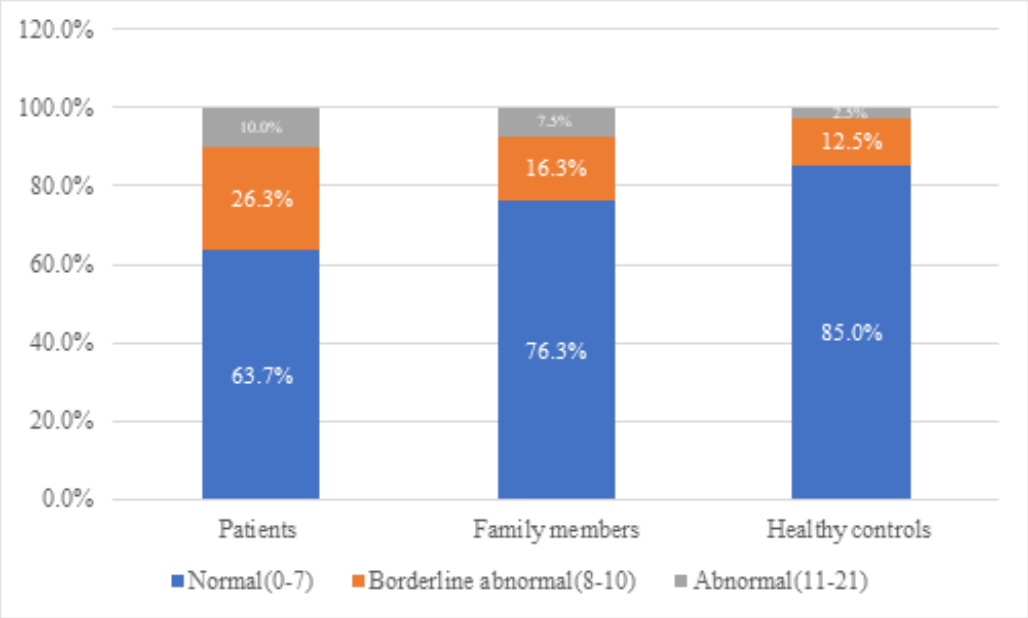


Table 7. Correlation study (r_s coefficient and *p*-value) between family members' anxiety scores and other study variables: Psoriasis Area Severity Index (PASI) and patients' anxiety and depression, and family members' depression scores

	Family members' anxiety scores	
Disease severity(PASI)	r_s=0.128	p=0.256
Patients' anxiety	r_s=0.414	p<0.001
Patients' depression	r_s=0.359	p<0.001
Family members' depression	r_s=0.674	p<0.001

The anxiety level of family members was correlated to the patient's anxiety and depression level (r_s=0.414; p<0.001 and r_s=0.359; p<0.001, respectively), as shown in Table 7. The anxiety level of family members was also strongly correlated with their own depression level (r_s=0.674; p<0.001). However, no significant correlation was found between family members' anxiety level and the patient's psoriasis severity (r_s=0.128; p=0.256).

Depression

The mean depression scores (HADS-D) was 5.45±3.94 for patients, 4.54±4.20 for family members, and 3.93±2.87 for healthy controls, with significant differences (p<0.001; Table 6) detected among the groups. Depression levels were similar between patients and family members (p=0.363). Patients' depression level was significantly higher than the control group (5.45 vs 3.93; p=0.034), but there was no significant difference between the depression level of family members and the control group based on post-hoc analysis (p=0.953).

Twenty-nine (36.3%) psoriatic patients had a depression score≥8, and 19 (23.8%) family members had a depression score≥8, which is suggestive of depression disorder. Twelve (15.0%) healthy controls reported depression scores ≥8, as shown in Figure 5.

The depression level of the family members had a positive correlation with the patients' anxiety and depression level (r_s=0.430; p<0.001 and r_s= 0.416, p<0.001, respectively; Table 8). As expected, the depression level of family members was strongly correlated with their own anxiety level ((r_s=0.674 ; p<0.001). However, no association found between family members' depression level and psoriasis disease severity (r_s=-0.004; p=970).

Table 8. Correlation of the family members' depression score with patient's psoriasis area severity index (PASI) score and patient's psychological state

	Family members' depression scores	
Disease severity(PASI)	r_s=-0.004	p=0.970
Patients' anxiety	r_s=0.430	p <0.001
Patients' depression	r_s=0.416	p <0.001

The study subjects with a HADS-A or HADS-D score≥8 were informed, and with their permission, they were referred to a psychiatrist for further assessment.

Discussion

Psoriasis is associated with significant psychosocial morbidity and profoundly impacts patients' quality of life. The burden of disease is not limited to the patients but may extend to the rest of the family. Therefore, family impact data are potentially essential measurements of the overall burden of skin disease. The impact of psoriasis on patients' quality of life in Malaysia has been reported previously,[30-32] but only limited data is available on the secondary impact of psoriasis on close family members.

The most important finding of this study is the considerable burden of psoriasis on the QoL of patients and their families. In this study, the mean DLQI of patients was 8.89±7.58, with one-third (36.3%) of the patients having a DLQI score of more than 10, showing the considerable impact of the disease on patients' life. This finding was similar to the 10-year review of the Malaysian Psoriasis Registry,[31] in which the mean DLQI was reported as 8.5±6.6, with 33.1% of the patients scoring more than 10. Another local study on 223 patients,[32] evaluating the health-related QoL of psoriatic patients using DLQI, also showed a similar finding with 30% of the psoriatic patients experienced severe impairment of QoL with a median DLQI of 7.

The present study results revealed that psoriasis had significantly impaired the quality of life of close family members. A total of 42 (52.5%) family members reported a moderate-to-severe impairment in their QoL**.** The mean FDLQI score of family members was 7.58±6.09, with 27.5% (*n*=22) of family members sustained severe QoL impairment with a score of more than 10. The most highly affected areas were the emotional distress, the burden of care, housework and extra household expenditure. Emotional impairment had been reported as the most affected item in previous studies that based on the FDLQI questionnaire.[15,33] As expected, families of patients with moderate to severe psoriasis based on PASI reported significantly higher scores on the FDLQI compared to those with mild psoriasis. A greater impact was also found in married family members, implying a potential negative effect of psoriasis on the couple relationships. Patient sexual dysfunction greatly impairs partners' quality of life.[34] According to previous studies, after getting psoriasis, a reduction in the frequency of sexual intercourse occurred in more than 90% of the relationship and 40% of psoriasis partners suffer from sexual dysfunction.[35-36]

In our study, no significant correlation could be found between PASI and FDLQI scores of family members. There was also no association found between PASI and the psychological state of both patients and family members. This observation suggests that psychosocial distress and quality of life are not always proportional to the disease severity. Instead, the degree of deterioration in the quality of life of family members was more strongly influenced by patients' psychological distress. These findings were consistent with previous studies that examine the impact of psoriasis on patients and families' lives.[36-38] This may be due to the pitfalls of the disease severity assessment tool i.e. PASI, which does not attach additional importance to small, yet visible or sensitive body parts such as the face, hands and genitals. Furthermore, psoriasis affects patients' perception of themselves and patients may still have a significant psychosocial disability even with limited skin disease.[40] Psoriatic patients usually have an unfavourable self-perceptions with lowered self-esteem and negative body image.

The presence of anxiety and depression has been established in patients with psoriasis. In addition, it has been reported that the point prevalence of mental disorders was higher in patients with psoriasis than in patients with other dermatological conditions.[41-43] We discovered a significantly higher prevalence of moderate to severe anxiety (18.8% vs. 2.5%) and depression (10.0% vs. 2.5%) among psoriatic patients than controls. These findings were comparable with a similar study using HADS for psoriatic patients in Singapore. In their research, 17% of their cohort of psoriatic patients had anxiety, and 15% had a depressive disorder with a score of more than 11.[44] In comparison with another similar study by Bakar RS et al. in Malaysia[45], our study had a higher prevalence of anxiety (40.1% vs 16.9%)) and depression (36.3% vs 8.5%) among psoriatic patients based on the cut-off point of 8 on HADS. These could be possibly due to differences in the socio-economic background of the study population, as our study was done in an urban population and the ongoing COVID-19 pandemic could also be a contributing factor as well.

In this study, the prevalence of family members with anxiety symptoms was 32.5% with a HADS-A mean score of 5.29±4.07, whereas for depression, there were 23.75% of family members who had experienced depressive symptoms with a HADS-D mean score of 4.54±4.20. It was comparable to the control group, in which the prevalence of anxiety and depression was 25% and 21.25%, respectively. However, most of the controls only experienced mild anxiety and depressive symptoms compared to the family members who had higher percentages of moderate to severe anxiety and depressive symptoms. The prevalence of anxiety and depression of healthy controls was significantly higher compared to the overall national prevalence of depression and anxiety, which ranges between 8 and 12%.[46-49] This is probably due to the ongoing COVID-19 pandemic. The emergence of the COVID-19 pandemic has negatively affected mental health either due to its direct psychological effects or long-term economic and social consequences.[50-52] A substantial increase in the prevalence and burden of major depressive disorder and anxiety disorders as a result of the COVID-19 pandemic has been reported.[53]

It is crucial to identify psychiatric comorbidity among psoriasis patients and their family members as it would negatively affect the response to psoriasis treatment.[53] Future studies are needed to determine the mechanism by which psoriasis is associated with depression, anxiety, and approaches to prevent such adverse outcomes in patients with psoriasis and families. Our study results support the adoption of an integrated approach that recognises that psoriasis does not affect the patients alone. We should treat the patient holistically, considering not only the QoL and psychological health of patients, but it is also essential to ensure the overall well-being of their family members. Moreover, healthcare policy should consider not only patients' needs but also their cohabitants.

Limitations

This study was limited by its cross-sectional design, which allowed for correlation but no causation. Furthermore, the number of participants in our study was relatively small, and it was a single centre study that may not reflect the actual characteristic of the local population. Further studies with larger numbers of patients and cohabitants are needed before any comparisons can be made among groups of different psoriasis severity. In addition, many patients included in this study had mild to moderate psoriasis, which could have depreciated the results. Moreover, controls in the present study were mainly healthcare staffs, whose psychological stress might be higher than that of the general population during the COVID-19 pandemic.[54] Assessing the quality of life in healthcare settings is challenging, since psychometric instruments can often not accurately translate the magnitude of the impact imposed by any disease on an individual's life.

Conclusion

In summary, this study showed that psoriasis has a profound impact on the QoL and psychological health of the patients and their family members. Therefore, healthcare professionals should adopt a comprehensive approach while treating psoriasis patients, taking into account the physical aspect and the quality of life and psychosocial health of both patients and their family members.

Conflict of Interest Declaration

The authors have no conflict of interest to declare.

Acknowledgement

The authors would like to thank the Director-General of Health, Malaysia for permission to publish this paper.

References

1. Michalek IM, Loring B, John SM. A systematic review of worldwide epidemiology of psoriasis. J Eur Acad Dermatol Venereol 2017;31:205-12.
2. Parisi R, Iskandar IYK, Kontopantelis E, Augustin M, Griffiths CEM, Ashcroft DM. Global Psoriasis Atlas. National, regional, and worldwide epidemiology of psoriasis: systematic analysis and modelling study. Br J Dermatol 2020;369:m1590.
3. Springate DA, Parisi R, Kontopantelis E, Reeves D, Griffiths CE, Ashcroft DM. Incidence, prevalence and mortality of patients with psoriasis: a U.K. population-based cohort study. Br J Dermatol 2017;176:650-8.
4. Łakuta P, Marcinkiewicz K, Bergler-Czop B, Brzezińska-Wcisło L, Słomian A. Associations between site of skin lesions and depression, social anxiety, body-related emotions and feelings of stigmatisation in psoriasis patients. Postepy Dermatol Alergo 2018;35:60-6.
5. Hawro M, Maurer M, Weller K, Maleszka R, Zalewska-Janowska A, Kaszuba A et al. Lesions on the back of hands and female gender predispose to stigmatisation in patients with psoriasis. J Am Acad Dermatol 2017;76:648-54.e2.
6. Yang EJ, Beck KM, Sanchez IM, Koo J, Liao W. The impact of genital psoriasis on quality of life: a systematic review. Psoriasis (Auckl) 2018;8:41-7.
7. de Korte J, Sprangers MA, Mombers FM, Bos JD. Quality of life in patients with psoriasis: a systematic literature review. J Investig Dermatol Symp Proc 2004;9:140-7.
8. Basra MK, Finlay AY. The family impact of skin diseases: the Greater Patient concept. Br J Dermatol 2007;156:929-37.
9. Krueger G, Koo J, Lebwohl M, Menter A, Stern RS, Rolstad T. The impact of psoriasis on quality of life: results of a 1998 National Psoriasis Foundation patient-membership survey. Arch Dermatol 2001;137:280-4.
10. Choi J, Koo JY. Quality of life issues in psoriasis. J Am Acad Dermatol 2003;49:S57-61.
11. Mease PJ, Menter MA. Quality-of-life issues in psoriasis and psoriatic arthritis: outcome measures and therapies from a dermatological perspective. J Am Acad Dermatol 2006;54:685-704.
12. Armstrong AW, Schupp C, Wu J, Bebo B. Quality of life and work productivity impairment among psoriasis patients: findings from the National Psoriasis Foundation survey data 2003-2011. PLoS One 2012;7:e52935.
13. Richards HL, Chong SLP, Mason DL, Griffiths CE. The impact of psoriasis on healthy partners of patients with psoriasis. Br J Dermatol 2002;147:S40.
14. Eghlileb AM, Davies EE, Finlay AY. Psoriasis has a major secondary impact on the lives of family members and partners. Br J Dermatol 2007;156:1245-50.
15. Basra MK, Sue-Ho R, Finlay AY. The Family Dermatology Life Quality Index: measuring the secondary impact of skin diseases. Br J Dermatol 2007;156:528-38.
16. Eghlileb AM, Basra MK, Finlay AY. The psoriasis family index: preliminary results of validation of a quality of life instrument for family members of patients with psoriasis. Dermatology 2009;219:63-70.
17. Tadros A, Vergou T, Stratigos AJ, Tzavara C, Hletsos M, Katsambas A et al. Psoriasis: is it the tip of the iceberg for the quality of life of patients and their families? J Eur Acad Dermatol Venereol 2011;25:1282-7.
18. Martínez-García E, Arias-Santiago S, Valenzuela-Salas I, Garrido-Colmenero C, García-Mellado V, Buendía-Eisman A. Quality of life in persons living with psoriasis patients. J Am Acad Dermatol 2014;71:302-7.
19. Lamb RC, Matcham F, Turner MA, Rayner L, Simpson A, Hotopf M et al. Screening for anxiety and depression in people with psoriasis: a cross-sectional study in a tertiary referral setting. Br J Dermatol 2017;176:1028-34.
20. Bozek A, Reich A. The reliability of three psoriasis assessment tools: psoriasis Area and Severity Index, body surface area and Physician Global Assessment. Adv Clin Exp Med 2017;26:851-6.
21. Langley RG, Ellis CN. Evaluating psoriasis with Psoriasis Area and Severity Index, Psoriasis Global Assessment, and Lattice System Physician's Global Assessment. J Am Acad Dermatol 2004;51:563-9.
22. Finlay AY, Khan GK. Dermatology Life Quality Index (DLQI)--a simple practical measure for routine clinical use. Clin Exp Dermatol 1994;19:210-6.
23. Basra MK, 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.
24. Hongbo Y, Thomas CL, Harrison MA, Salek MS, Finlay AY. Translating the science of quality of life into practice: What do dermatology life quality index scores mean? J Invest Dermatol 2005;125:659-64.
25. Basra MK, Sue-Ho R, Finlay AY. The Family Dermatology Life Quality Index: measuring the secondary impact of skin disease. Br J Dermatol 2007;156:528-38. Erratum in: Br J Dermatol 2007;156:791.
26. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand 1983; 67:361-70.
27. Snaith RP. The Hospital Anxiety And Depression Scale. Health Quality Life Outcomes 2003;1:29.
28. Bjelland I, Dahl AA, Haug TT, Neckelmann D. The validity of the Hospital Anxiety and Depression Scale. An updated literature review. J Psychosom Res 2002;52:69-77.

29. Yahya F, Othman Z. Validation of the Malay version of hospital anxiety and depression scale (HADS) in hospital Universiti Sains Malaysia. Int Med J 2015;22:80-2.
30. Tang MM, Chang CC, Chan LC, Heng A. Quality of life and cost of illness in patients with psoriasis in Malaysia: a multicenter study. Int J Dermatol 2013;52:314-22.
31. Mohd Affandi A, Khan I, Ngah Saaya N. Epidemiology and Clinical Features of Adult Patients with Psoriasis in Malaysia: 10-Year Review from the Malaysian Psoriasis Registry (2007-2016). Dermatol Res Pract 2018;2018:4371471.
32. Nyunt WW, Low WY, Ismail R, Sockalingam S, Min AK. Determinants of health-related quality of life in psoriasis patients in Malaysia. Asia Pac J Public Health 2015;27:NP662-73.
33. Higaki Y, Tanaka M, Futei Y, Kamo T, Basra MKA, Finlay AY. Japanese version of the Family Dermatology Life Quality Index: Translation and validation. J Dermatol 2017;44:914-9.
34. Mehrmal S, Uppal P, Nedley N, Giesey RL, Delost GR. The global, regional, and national burden of psoriasis in 195 countries and territories, 1990 to 2017: A systematic analysis from the Global Burden of Disease Study 2017. J Am Acad Dermatol 2021;84:46-52.
35. Alariny AF, Farid CI, Elweshahi HM, Abbood SS. Psychological and Sexual Consequences of Psoriasis Vulgaris on Patients and Their Partners. J Sex Med 2019;16:1900-11.
36. Halioua B, Maccari F, Fougerousse AC, Parier J, Reguiai Z, Taieb C et al. Impact of patient psoriasis on partner quality of life, sexuality and empathy feelings: a study in 183 couples. J Eur Acad Dermatol Venereol 2020;34:2044-50.
37. Kirby B, Richards HL, Woo P, Hindle E, Main CJ, Griffiths CE. Physical and psychologic measures are necessary to assess overall psoriasis severity. J Am Acad Dermatol 2001;45:72-6.
38. Richards HL, Fortune DG, Griffiths CE, Main CJ. The contribution of perceptions of stigmatisation to disability in patients with psoriasis. J Psychosom Res 2001;50:11-5.
39. Finzi A, Colombo D, Caputo A, Andreassi L, Chimenti S, Vena G et al. Psychological distress and coping strategies in patients with psoriasis: the PSYCHAE Study. J Eur Acad Dermatol Venereol 2007;21:1161-9.
40. Perrott SB, Murray AH, Lowe J, Mathieson CM. The psychosocial impact of psoriasis: physical severity, quality of life, and stigmatisation. Physiol Behav 2000;70:567-71.
41. Dowlatshahi EA, Wakkee M, Arends LR, Nijsten T. The prevalence and odds of depressive symptoms and clinical depression in psoriasis patients: a systematic review and meta-analysis. J Invest Dermatol 2014;134:1542e1551.
42. McDonough E, Ayearst R, Eder L, Chandran V, Rosen CF, Thavaneswaran A et al. Depression and anxiety in psoriatic disease: prevalence and associated factors. J Rheumatol 2014;41:887-96.
43. Kurd SK, Troxel AB, Crits-Christoph P, Gelfand JM. The risk of depression, anxiety, and suicidality in patients with psoriasis: a population-based cohort study. Arch Dermatol 2010;146:891-5.
44. Tee SI, Lim ZV, Theng CT, Chan KL, Giam YC. A prospective cross-sectional study of anxiety and depression in patients with psoriasis in Singapore. J Eur Acad Dermatol Venereol 2016;30:1159-64.
45. Bakar RS, Jaapar SZS, Azmi AF, Aun YC. Depression and anxiety among patients with psoriasis: A correlation with quality of life and associated factors. J Taibah Univ Med Sci 2021;16:491-6.
46. Tan KL, Yadav H. Depression among the urban poor in Peninsular Malaysia: A community based cross-sectional study. J Health Psychol 2013;18:121-7.
47. Yeoh SH, Tam CL, Wong CP, Bonn G. Examining Depressive Symptoms and Their Predictors in Malaysia: Stress, Locus of Control, and Occupation. Front Psychol 2017;8:1411.
48. Ng CG. A review of depression research in malaysia. Med J Malaysia 2014;69:42-5.
49. Kader Maideen SF, Mohd Sidik S, Rampal L, Mukhtar F. Prevalence, associated factors and predictors of anxiety: a community survey in Selangor, Malaysia. BMC Psychiatry 2015;15:262.
50. Leong Bin Abdullah, Ahmad Yusof H, Mohd Shariff N, Hami R, Nisman NF, Law KS. Depression and anxiety in the Malaysian urban population and their association with demographic characteristics, quality of life, and the emergence of the COVID-19 pandemic. Curr Psychol 2021;40:6259-70.
51. Al Omari O, Al Sabei S, Al Rawajfah O, Abu Sharour L, Aljohani K, Alomari K et al. Prevalence and Predictors of Depression, Anxiety, and Stress among Youth at the Time of COVID-19: An Online Cross-Sectional Multicountry Study. Depress Res Treat 2020;2020:8887727.
52. COVID-19 Mental Disorders Collaborators. Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic. Lancet 2021;398:1700-12.
53. Fortune DG, Richards HL, Kirby B, McElhone K, Markham T, Rogers S et al. Psychological distress impairs clearance of psoriasis in patients treated with photochemotherapy. Arch Dermatol 2003;139:752-6.
54. Salari N, Khazaie H, Hosseinian-Far A, Khaledi-Paveh B, Kazeminia M, Mohammadi M et al. The prevalence of stress, anxiety and depression within front-line healthcare workers caring for COVID-19 patients: a systematic review and meta-regression. Hum Resour Health 2020;18:100.