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Dermatology Life Quality Index Correlation with Different Demographic and Clinical Factors in Psoriasis Patients: A Hospital-Based Cross-Sectional Study

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Abstract

Background: Psoriasis has significant negative impact on patients'quality of life. Dermatology Life Quality Index (DLQI) is an easy and practical way of quantifying the impact of skin disease. Socio-demographic and clinical factors can affect the quality of life in psoriasis.

Aim of Study: To detect different demographic and clinical factors that affect quality of life in Egyptian psoriatic patients.

Patients and Methods: This study was conducted on 400 psoriasis patients of both sex with age above 16 years. Full history taking, clinical examination and investigations were done to detect different demographic and clinical data that would affect DLQI. DLQI questionnaire was used in this study to assess the impact of psoriasis on quality of life.

Results: DLQI ranged from 0 to 30 with mean ± SD = 12.23±6.91. Positive correlation was detected between DLQI and each of extent of the lesions (p<0.001, r=0.418) and Psoriasis Area and Severity Index scoring (p<0.001, r=0.403). Significant relations were detected between DLQI and each of the following: The course of the disease (p=0.038), the site of the lesions (p<0.001), the type of psoriasis (p<0.001) . No correlations or relations were detected between DLQI and other studied factors.

Conclusion: Psoriasis extent and severity, site of lesions in exposed areas, course of the disease and type of psoriasis affect DLQI significantly. Socio-demographic factors didn't affect DLQI in our patients. Handling conditions that affect DLQI seriously would improve the quality of life in psoriasis patients. This approach could be an important target in the treatment of this chronic disease.

Key Words: *Psoriasis – DLQI – Demographic data – Clinical data.*

Introduction

PSORIASIS is a common chronic inflammatory skin disease associated with a variety of comorbidities **[1]**. It is associated with a multitude of psychological impairments as patients' lives become difficult especially when psoriasis is present in highly visible areas of the skin such as the face and hands. It affects every day social activities and work. It causes embarrassment, lack of self-esteem, anxiety and depression **[2,3]**.

Measuring the impact of diseases on Quality of Life (QOL) is valuable in clinical practice and evaluation of therapy **[4,5]**.

The Dermatology Life Quality Index (DLQI) is an easy and practical way of quantifying the impact of skin disease on QOL **[6]**. It has been shown to have good reliability and validity when used in a dermatological setting **[7,8]**. Moreover, the DLQI can be used as a major criterion for the selection of type of treatment for psoriasis regardless its severity i.e. systemic therapies may be the first choice in patients with mild psoriasis and high QOL impairment **[9]**. Various socio-demographic and clinical factors can affect the quality of life in psoriasis **[10]**.

The aim of our study is to detect different demographic and clinical factors that affect QOL in Egyptian psoriatic patients, in a trial to handle the possible one.

Patients and Methods

This hospital-based cross-sectional study was conducted on 400 Egyptian patients with psoriasis collected from Kasr Al-Ainy Psoriasis Unit, Dermatology Department, Cairo University from March 2017 to August 2018. The study protocol was approved by the Local Medical Ethics Committee. An informed consent form was signed by all patients before participation in the study.

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Patients of both sex, above 16 years and with any clinical type of psoriasiswere included in the study. Patients with an associated dermatologic disease with a known impact on QOL were excluded from the study.

Full history was taken from each patient including age, marital status, residence, occupation, smoking, family history of psoriasis, precipitating factors, onset, course and duration of psoriasis in addition tohistory of any associated diseases. Psoriasis assessment was done to identify the type of psoriasis, site of lesions, extent and severity of the disease using rule of nine **[11]** and Psoriasis Area and Severity Index (PASI) score **[12]**. Measuring weight, height, waist circumference and blood pressure as well as calculating Body Mass Index (BMI) (weight in kilograms divided by height in meter square) was also done for each patient. Lab investigations were done including fasting blood sugar, triglycerides, cholesterol, high density lipoprotein and low density lipoprotein. Metabolic syndrome was estimated according to the New International Diabetes Federation (IDF) **[13]**. The impact of psoriasis on QOL was assessed using DLQI questionnaire. This questionnaire is designed for use in patients over the age of 16. It is self-explanatory and can be simply handed to the patient who is asked to fill it in without the need for detailed explanation. It is usually completed in one or two minutes. The DLQI consists of 10 questions concerning symptoms, feelings, daily activities, leisure, work, school, personal relationships and treatment **[6]**. Each question has four answers scoring from 0-3. The patient is asked to choose one answer for each question. The DLQI score is then calculated by summing the score of each question resulting in a maximum of 30 and a minimum of 0. The higher the score, the more quality of life is impaired. In our study we used the Arabic version of DLQI (https: //www.cardiff.questionnaires/dermatology-life-quality-index). According to the score of the DLQI the impact of psoriasis on QOL is then graded into: no effect at all on patient's life (0-1), small effect (2-5), moderate effect (6-10), very large effect (11-20) and extremely large effect on patient's life (21-30).

Socio-Economic Status (SES) questionnaire was also used in this study to determine the socioeconomic level of the patients. We used a scale including 7 domains with a total score of 84 **[14]**. The socioeconomic level was then classified into very low (0-21), low (22-42), middle (43-63) and high levels (64-84) depending on the calculated score. The seven main domains are: Education and cultural (score=30), Occupation domain (score=10), Family possessions domain (score=12), Family domain (score=10), Home sanitation domain (score =12), Economic domain (score=5) and Health care domain (score=5).

Data were coded and entered using the statistical package SPSS (Statistical Package for the Social Sciences) version 25. Data was summarized using mean, standard deviation, median, minimum and maximum in quantitative data and using frequency (count) and relative frequency (percentage) for categorical data. Comparisons between quantitative variables were done using the non-parametric Kruskal-Wallis and Mann-Whitney tests **[15]**. For comparing categorical data, Chi square (χ^2) test was performed. Exact test was used instead when the expected frequency is less than 5 **[16]**. Correlations between quantitative variables were done using Spearman correlation coefficient **[17]**. *p*-values less than 0.05 were considered as statistically significant.

Results

This study included 400 psoriasis patients. Their ages ranged from 16 to 81 years old with mean ± SD = 48.5±32.5 and median of 48.5 years. Socio-demographic and clinical data of the patients are illustrated in (Tables 1-3).

Table (1): Socio-demographic data of the patients.

	Number of patients	%
Sex:		
Male	228	57.0
Female	172	43.0
Marital status:		
Single	70	17.5
Married	325	81.25
Divorced	5	1.25
Residence:		
Urban	302	75.5
Rural	98	24.5
Occupation:		
Outdoors	110	27.5
Indoors	93	23.25
Unemployed	197	49.25
Smoking:		
Yes	116	29.0
No	284	71.0
Socio-economic status score (grading):		
Very low	34	8.5
Low	287	71.75
Middle	77	19.25
High	2	0.5

Table (2): Clinical data of the patients (numerical).

	Mean ± SD	Median	Range
• Duration of the disease (months)	112.14±114.61	74.50	1-720
• BSA (extent "rule of 9" %)	27.55±25.58	20.00	1-97
• PASI score	10.72±9.08	8.05	0.10-49.80
• BMI (Kg/m^2)	30.16±7.52	29.20	13.84-59
• DLQI	12.23±6.91	12.00	0-30

SD : Standard Deviation. BSA : Body Surface Area. PASI : Psoriasis Area and Severity Index.
BMI: Body Mass Index.
DLQI: Dermatology Life Quality Index.

Table (3): Clinical data of the patients (non-numerical).

	Number of patients	%
Precipitating factors:		
Yes	295	73.75
No	105	26.25
Onset:		
Sudden	66	16.5
Gradual	334	83.5
Course:		
Stationary	3	0.75
Remission & exacerbation	184	46.0
Regressive	13	3.25
Progressive	200	50.0
Affected sites:		
Hidden	15	3.75
Non-hidden	120	30.0
Both	265	66.25
BMI (grading):		
Under weight	9	2.25
Normal	105	26.25
Over weight	105	26.25
Obese	141	35.25
Morbidly obese	40	10.0
Family history of psoriasis:		
Negative	334	83.5
Positive	66	16.5
Type of psoriasis:		
Erythrodermic psoriasis	15	3.75
Classic psoriasis plaque	354	88.5
Guttate psoriasis	20	5.0
Palmoplantar psoriasis	11	2.75
Associated diseases:		
Hypertension	67	16.75
Diabetes mellitus	55	13.75
Cardiac problems	16	4.0
HCV	21	5.25
Metabolic syndrome	131	32.75

BMI : Body Mass Index.

HCV: Hepatitis C Virus Disease.

Results of DLQI:

DLQI ranged from 0 to 30 with mean ± SD = 12.23±6.91 (Table 2). Regarding DLQI grades of the 400 patients, 25 (6.25%) had no effect on DLQI, 41 (10.25%) had small effect, 109 (27.25%) had moderate effect, 125 (44.75%) had very large effect and 46 (11.5%) had extremely large effect on DLQI.

Effect of patients' data on DLQI:

Positive correlation was detected when correlating DLQI with extent of the disease and PASI score (p<0.001, r=0.418 & p<0.001, r=0.403 respectively) Fig. (1).

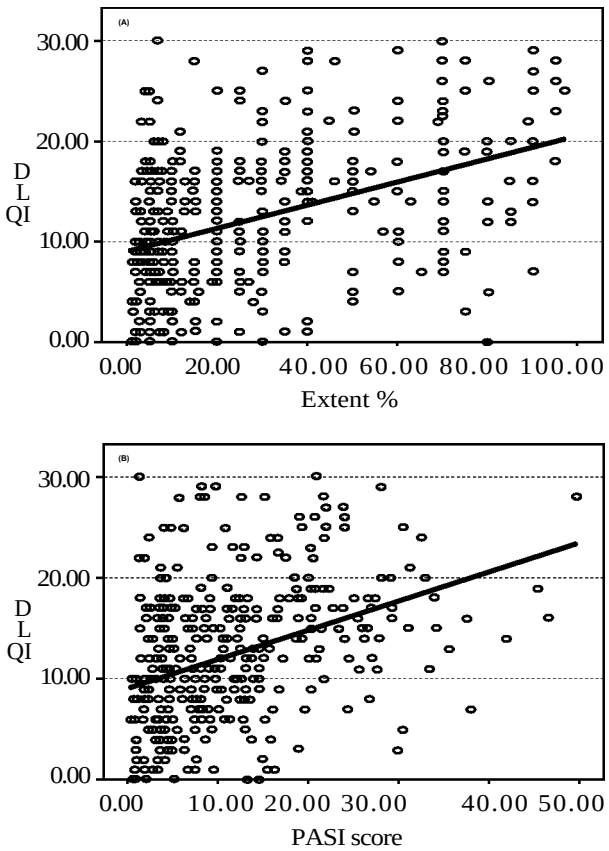

Fig. (1): (A) Positive correlation between extent of lesions and DLQI. (B) Positive correlation between PASI score and DLQI.

Significant relation was detected between DLQI and course of psoriasis (p=0.038) where patients with progressive course of psoriasis had the worst DLQI (mean ± SD = 12.98±6.53) followed by patients with remission and exacerbations (11.57± 7.17) then patients with regressive course of psoriasis (11.08±8.35) and finally those with stationary course (7.33±4.62) Fig. (2A).

Significant relation was detected between DLQI and affected sites (p<0.001). Patients with lesions in both hidden and non-hidden sites of the body had the worst DLQI (mean ± SD = 13.30±6.

followed by the non-hidden sites (10.25±6.64) thenthe hidden sites (9.20±8.26) Fig. (2B).

Significant relation was detected between DLQI and types of psoriasis (p<0.001). Patients with erythrodermic psoriasis had the worst DLQI (19.60 ± 7.93), followed by those with classic plaque psoriasis (12.24±6.60), followed by those with guttate psoriasis (9.45±7.31) then, those with palmoplantar psoriasis (6.27±5).

No correlations were found in our study between DLQI and patients' socio-demographic data (age, sex, occupation, marital status, residence, smoking and socio-economic status) or with their BMI, the duration of the disease or the presence of any associated comorbidities (Hypertension, Diabetes Mellitus, Hepatitis C virus and Metabolic syndrome).

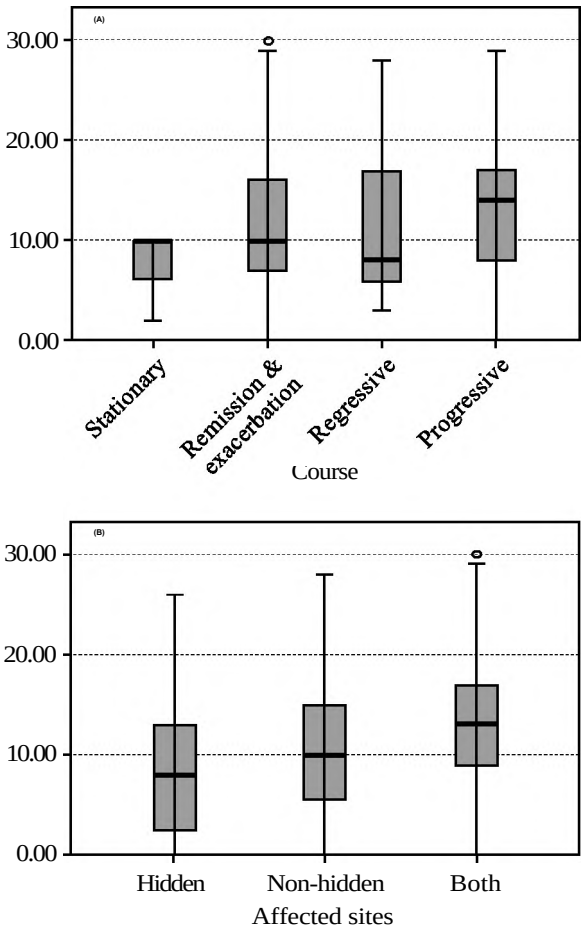

Fig. (2): (A) Significant relation between DLQI and course of psoriasis. (B) Significant relation between the affected sites and DLQI.

Discussion

In psoriasis, physical as well as QOL measures are necessary to assess disease severity when decisions are taken over psoriasis treatment and when assessing the outcome of such decisions **[18]**. In our study we observed that most of the patients had considerable disability of their QOL where 125 (44.75%) had moderate effect, 109 (27.25%) had very large effect and 46 (11.5%) had extremely large effect on DLQI while only 25 (6.25%) had no effect on DLQI, 41 (10.25%) had small effect on DLQI. This could illuminate the negative impact of psoriasis on QOL of patients. Our results are in agreement with Eid & Elweshahi, **[19]** study which was done on 274 Egyptian psoriasis patients, Aghaei et al., **[20]** study in Iran and Tejada Cdos et al., **[21]** studyin southern Brazil.

Positive correlation was detected in our study between DLQI and both, the extent of psoriasis and PASI score. That was in agreement with Tang et al., **[22]** studywho reported that the impact of disease on QOL was found to be greater in those with more extensive psoriatic lesion involvement. The same with Nayak et al., **[23]** and Sojevi´c Timotijevi´c et al., **[24]** who reported in their studies significant positive correlation between PASI score and DLQI score. In addition to Mattei et al., **[25]** study who reported that reduction in PASI score of at least 75% can be translated to significant QOL improvement in treated psoriasis patients. Other studies reported the same results as Eid and Elweshahi, **[19]** & Aghaei et al., **[20]**. These correlations account for the more visible lesions, more symptoms like itching and scaling and the more mess the patient could face as the extent and PASI score increase in addition to deterioration in the general condition. Thus, more psychological burden and increase in the DLQI score.

In addition, significant relation was detected in our study between DLQI and course of the disease where progressive course had the largest effect on DLQI than other types of disease course. That was in agreement with Nayak et al., 2018 **[23]** study who reported that the chronic progressive course of psoriasis along with disease severity, impairs QOL. That's to say, with progressive course, the disease was often seen by patients as incomprehensible, incurable, and uncontrollable, hence, increase in DLQI.

Type of psoriasis also affect DLQI significantly. We found in our study that erythrodermic psoriasis had the largest effect among other types of psoriasis on DLQI. That was logic regarding that erythrodermic psoriasis has the largest extent of BSA than other types of psoriasis in addition to the worst general condition of the patient. That was contradictory to the results of an Iranian study by Moradi

et al., 2015 **[26]** who found no statistically significant difference in QOL regarding clinical types of psoriasis in Iran. But our results agree with another study in Iran by Zandi, et al. 2011, **[27]** who reported that erythrodermic type of psoriasis were predictors of the greatest QOL impairment measured by DLQI.

Also the affected site whether hidden, non-hidden or both, had significant relation with DLQI. We found that patients with lesions in both hidden and non-hidden sites had the highest DLQI, most probably due the generalized distribution of psoriasis, followed by the non-hidden sites which are visible to other people causing psychological embarrassment and stigmatization in addition to the low self-esteem, then the hidden sites which definitely affect patient's quality of life but are not visible to other people. That was in agreement with Sojevi´c Timotijevi´c et al., **[24]** study who reported that improvement of psoriasis in visible body regions has an appreciable influence on QOL improvement, and may positively affect treatment success in patients with psoriasis.

Women and men have different subjective perceptions of how symptoms affect their social interactions, emotional states and, ultimately, their QOL. Men can find it easier to distance themselves from the social effects of psoriasis. Women, in contrast, are more likely to report feeling 'upset', ' disturbed' or 'ashamed' in social settings **[28]**. However, in our study no significant relations were detected between sex of the patients and DLQI. Our results were in agreement with Singhal et al., **[29]** study. While contradictory with Sojevic´ Timotijevi´c et al., **[24]** study, who reported that sex of the patients affects DLQI score significantly where men were more affected than women, and Mabuchi et al., **[30]** study who reported that QOL is seriously affected in females more than males.

Factors such as age, disease duration and presence of comorbidities can all be associated with reduced QOL in people with psoriasis **[31]**. In our study no correlations were detected between DLQI of the patients and their age which was in agreement with Singhal et al., **[29]** study while contradictory with Sojevi´c Timotijevi´c et al., **[24]** study who reported that the older the age the more the impact of psoriasis and Young, 2005 **[32]** study who reported more impact of psoriasis on young adults. In addition, López-Estebaranz et al., **[33]** study detected that the mean DLQI total score varied significantly across age groups.

Regarding disease duration, no correlation was detected in our study between disease duration and DLQI. That was in agreement with Singhal et al., **[29]** study but in contrast to Sojevi´c Timotijevi´c et al., **[24]** study who detected negative impact of the disease duration on the QOL of patients.

In our study, no significant relations were detected between family history of psoriasis in patients and DLQI. That was contradictory with López-Estebaranz et al., **[33]** study who detected that the presence of a family history of psoriasis significantly affect the patient's QOL regardless of disease severity.

Psoriasis and obesity are accompanied by low-grade systemic inflammation, and in theory, obesity-derived pro-inflammatory mechanisms may worsen the severity of psoriasis in overweight individuals with psoriasis **[34]**. In our study, no correlations were detected between DLQI and BMI of the patients. That was in agreement with Petridis et al., 2018 **[35]** study. However, Jensen et al., 2016 **[36]** reported in their study that losing weight showed PASI improvement and a significant reduction in DLQI in overweight patients with psoriasis.

Patients with psoriasis, like those with other major medical disorders, have reduced levels of employment and income as well as impaired QOL. The combined costs of long-term therapy and social costs of the disease have a major impact on health care systems and on society in general **[37]**. However, no correlation was detected in our study between DLQI and socio-economic status or patients' occupation. Singhal et al., **[29]** also reported no significant relation between DLQI and occupation in their study. In the contrary, Nayak et al., **[23]** study reported a significant negative correlation between family income and DLQI and Jung et al., **[38]** study reported that QOL in patients with psoriasis was significantly associated with their socio-economic characteristics and employment status.

We observed in our study that patients with high socio-economic status showed the highest DLQI scores (however they were only two patients), followed by very low SES, then low SES and finally middle SES. This could be explained by the more concern of body image and good presentation in high socio-economic status people in general.

Psoriasis is an immune-mediated inflammatory skin disease that is strongly associated with the clinical features of the Metabolic Syndrome (MetS) **[39]**. In our study, metabolic syndrome was positive in 131 (32.75%) of the patients and negative in 269 (67.25%). A study was done in Turkey on 563

psoriasis patients, metabolic syndrome was found in 12.6% of the patients **[40]**. The prevalence of metabolic syndrome in psoriasis patients in the United States was 34.7% in 2011-2012 **[41]**. When we correlated DLQI with the associated comorbidities (Hypertension, Diabetes Mellitus, Hepatitis C virus, Cardiac diseases and Metabolic syndrome) in our patients, no significant relations were detected. Our results are contradictory with Souza et al., **[42]** study who reported that Metabolic syndrome has an important effect on DLQI of psoriasis patient.

In conclusion, different factors affect DLQI in psoriasis. Psoriasis extent of BSA and PASI score in addition to site of lesions in exposed areas, course of the disease and type of psoriasis affect DLQI significantly. Other data such as age, sex, occupation, residence, marital status and smoking in addition to BMI and socio-economic status did not affect DLQI significantly. Furthermore, the onset, duration, family history of psoriasis, in addition to the presence of comorbidities including metabolic syndrome also showed no significant effect on DLQI of patients. Handling conditions that affect DLQI seriously would improve the QOL in psoriasis patients which is a very important target in the treatment of this chronic disease.

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مؤشر جودة الحياة للآمراض الجلدية وعلاقته بالعوامل الديموغرافية والإكلينيكية المختلفة فى مرضى الصدفية: دراسة مقطعية على آساس المستشفى

الصدفية هو مرض طويل الآمد وقد يبدآ فى آى عمر. مرضى الصدفية لديهم تآثير سلبى كبير على نوعية حياتهم. مؤشر جودة الحياة للآمراض الجلدية الذى إستخدام فى هذه الدراسة هو طريقة سهلة وعملية لقياس تآثير الآمراض الجلدية على جودة حياتهم. العوامل الديموغرافية الإجتماعية وكذلك العوامل السريرية من الممكن آن تؤثر على نوعية الحياة لمرضى الصدفية. هدف هذه الدراسة هو الكشف عن العوامل الديموغرافية الإجتماعية والإكلينيكية لمرض الصدفية التى تؤثر على جودة حياة مرضى الصدفية المصريين.

ظهر فى هذه الدراسة ترابط إيجابى بين مؤشر جودة الحياة للآمراض الجلدية فى مرضى الصدفية مع مسار المرض، آماكن الإصابة بالمرض (مخفى آم غير مخفى)، نوع الصدفية، مدى إنتشار المرض فى الجسم، بالإضافة إلى مؤشر شدة منطقة الصدفية (مجموع ودرجات). لم يظهر آى ترابط بين مؤشر جودة الحياة للآمراض الجلدية فى مرضى الصدفية والبيانات الديموغرافية والإجتماعية للمرضى.

وبناءاً على هذه النتائج فقد تبين آن علاج مرض الصدفية لا يقتصر على علاج الجلد فقط ولكن يجب مراعات العوامل النفسية آيضاً.