Assessment of Quality of Life in a Sample of Iraqi Patients with Psoriasis

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Abstract

Psoriasis is a dermatological, chronic, immune-mediated condition. Psoriasis symptoms are not associated with physical burden only, but it may also have psychosocial effects on patients, diminished cognitive control, poor body image and impairments in everyday life. The value of quality of life is important since improving it is the principal goal for non-curative disease. The aim of the current study was to evaluate quality of life in a sample of Iraqi patients with psoriasis. This study is a cross-sectional study that involved 300 already diagnosed psoriasis patients who attended to the center of Dermatology and Venereology, Medical City/Baghdad. The mean age of patients was (35.156 ±10.549 years). The Arabic version of Dermatology Life Quality Index was used to assess quality of life. The mean total score is 11.29± 5.45 and the majority of the patients (53.7%) had a total score of more than 10, which indicates a significant deterioration in patients' quality of life. The greatest impact was found in symptoms and feelings (mean = 1.66 ± 0.75) while the lowest impact was noted in personal relationships (0.51± 0.65). Increasing age and monthly income as well as vulgaris type of psoriasis associated significantly better quality of life. While Psoriasis Area and Severity Index associated significantly worse quality of life. In conclusion, psoriasis exerts significant, negative impact on patients' quality of life, especially among those with younger age, lower monthly income, high disease activity, and types of psoriasis other than vulgaris.

Keywords: Psoriasis, Iraq, Dermatology life quality index, Quality of life, Psoriasis area and severity index.

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تقييم نوعية الحياة لدى عينة من المرضى العراقيين المصابين بالصدفية.

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الخلاصة

الصدفية هي مرض جلدي مزمن مناعي المنشئ. إن أعراض الصدفية لا توهن الجسد فحسب، بل يمكن أن يكون لها أيضًا تأثيرات نفسية واجتماعية وعاطفية وكذلك تأثير سلبي على منظر الجسم والفعاليات اليومية. إن قيمة جودة الحياة مهمة حيث ان تحسينها هو الهدف الرئيسي للأمراض غير القابلة للشفاء. كان الهدف من الدراسة الحالية هو تقييم جودة الحياة لدى عينة من المرضى العراقيين المصابين بالصدفية. هذه الدراسة عبارة عن دراسة مقطعية أجريت على ٣٠٠ من مرضى الصدفية المشخصين مسبقا والذين حضروا إلى مركز الأمراض الجلدية والزهرية، مدينة الطب/ بغداد. كان متوسط عمر المرضى هو (٣٥,١٥٦ ± ١٠,٥٤٩ سنة). تم تقييم جودة الحياة باستخدام النسخة العربية من دليل جودة الحياة للأمراض الجلدية. كان متوسط الدرجة الكلية هو ١١,٢٩ ± ٥,٤٥ ، وحصلت غالبية المرضى (٥٣,٧٪) على مجموع نقاط أكثر من ١٠ ، مما يشير إلى ضعف شديد في جودة حياة المرضى. ولوحظ الأثر الأكبر في الأعراض والمشاعر (المتوسط = ١,٦٦ ± ٠,٧٥) بينما لوحظ أقل تأثير في العلاقات الشخصية (٠,٥١ ± ٠,٦٥). ان زيادة العمر والدخل الشهري بالإضافة إلى نوع الصدفية الشائع يرتبط بشكل ملموس بنوعية حياة أفضل. بينما ارتبطت منطقة الصدفية ومؤشر الخطورة بشكل ملموس بنوعية حياة أسوء. كنتيجة فإن الصدفية لها تأثير سلبي كبير على جودة حياة المرضى، خاصة بين أولئك الذين هم أصغر سنا، واصحاب الدخل الشهري المنخفض، ونشاط مرضي مرتفع، وأنواع الصدفية الاخرى غير النوع الشائع.

الكلمات المفتاحية: الصدفية، جودة الحياة، مؤشر جودة الحياة للأمراض الجلدية، منطقة الصدفية ومؤشر الخطورة، العراق .

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Introduction

Psoriasis is a chronic, inflammatory condition that primarily affects the skin, hair, and the joints and associated with a significant humanistic and economic consequences [1, 2]. It occurs in about 1% to 3% worldwide, [3] with higher prevalence in western countries. [4] The precise cause of psoriasis stills unclears [5]. Psoriasis is closely related to genetics, but environmental exposure plays an essential role in the disease development. [4] Obesity is another risk factor for psoriasis [6]. Many medicinal and chemical products, have been found to be related to the triggering and/or exacerbation of psoriasis including beta-adrenergic receptor blockers and tetracycline [7,8].

Psoriasis is stimulated by the abnormal epidermal proliferation, leading to scaly erythematous plaques. [9] The pathophysiology of psoriasis includes an interplay between elements of the immune response, inflammatory components and an abnormal proliferation and differentiations of the keratinocytes, [10] results in scaly erythematous plaques. [9]

Psoriasis has many different clinical presentations. The classic one is of red plaques and silver scale, [11] associated symptoms of itch, burning and soreness. [12] Psoriasis is classified as mild, moderate, or severe, relying on the percentage of the affected body surface area (BSA) and the Psoriasis Area and Severity Index (PASI). [13]

The aims of treating psoriasis are to get an initial and fast control for disease symptoms, decrease the percentage of involved BSA, decrease plaque lesions, minimize adverse drug events, produce and maintain long-term remission, and improve the patient's quality of life (QOL). [11] Selection of treatment in patients with psoriasis depends on disease severity, [14] the presence of comorbid conditions, such as psoriatic arthritis, and treatment history. [15] Topical treatments are generally used as first-line therapy for most types of psoriasis [16] and include tar preparations, corticosteroids, calcipotriene, adarotene and anthralin. [11] Moderate-to-severe psoriasis is usually treated by using systemic therapies. Methotrexate and biologics are the most-used systemic treatments for psoriasis. [17] Biologics are often the next step in the treatment when conventional systemic therapies fail or are contraindicated. [17] Biologics are very effective potent immunomodulatory drugs. [18] They are generally considered safe drugs but may be associated with rare serious adverse reactions such as malignancy and reactivation of tuberculosis. [19]

The World Health Organization defined QOL as "the individuals 'perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns." [20] The QOL's value is important for knowing what is significant to the individuals' QOL since the principal goal for non-curative disease is to improve QOL. [21] Psoriasis can have a significant impact on patients' QOL and work productivity, depending on disease severity. [22] Symptoms of psoriasis are not limited to physical impact, they can also have strong psychosocial effects, [23] resulting in impaired emotional state, daily activity, and body image. [24]

Accordingly, the aim of the current study was to evaluate QOL in a sample of Iraqi psoriatic patients and to determine possible association between QOL and some patient's related factors.

Patients

The current study was a cross-sectional study that involved 300 already diagnosed psoriasis patients (mean age was 35.16 ±10.55 years) who attended to the Center of Dermatology and Venereology, Medical City/Baghdad from October 2019 to January 2020.

The number of male patients was 188 (62.67%), while the number of female patients was 112 (37.33%).

Inclusion criteria

1-Patients age ≥ 18 years who willing to participate in the study.
2-The duration of the disease is ≥ 6 months.
3-Prescribed pharmacological treatment for psoriasis.

Exclusion criteria

1- Patient with cognitive, speech, or a hearing deficits that would affect questions' understanding.
2-Patient with other skin disorders.
3-Concomitant other significant diseases (such as diabetes mellitus, hypertension, chronic lung disease, chronic renal failure, heart disease and stroke).
4-Pregnant or lactating women.
5-Patients who provide incomplete information.

Method

The questionnaires

The QOL was assessed by using the Arabic version of Dermatology Life Quality Index (DLQI). The DLQI is a validated, dermatology-specific QOL instrument that was developed in the early 1990s, [25,26] and has been used in several trials for psoriasis, [25] The DLQI questionnaire consists of 10 questions, subdivided into 6 domains related to various aspects of a person's QOL: symptoms and feelings (questions one and two), daily activities (questions three and four), leisure (questions five and six), work/school (question seven), personal relationships (questions eight and nine), and treatment (question ten). Higher scores indicate greater deterioration of the patient's QOL and vice versa. [27] Total DLQI score between 0 and 1 indicates no effect on patient's QOL, 2–5 small effect, 6–10 moderate effect, 11–20 very large effect, and 21–30 indicates extremely large effect on patients' QOL. [14]

Administration of the questionnaires

When the patients arrived to the Center of Dermatology and Venereology for checkup and to receive their medications, they were interviewed by the researcher and asked if they are willing to participate in the current study, if they agreed, then a clarification of the questionnaire was given and each patient allowed to fill the research questionnaire which takes about 5-10 minutes to be filled completely.

Statistical analysis

The analyses were done by using the Statistical Package for the Social Science (SPSS, version 22, IBM, New York, USA). Descriptive statistics (means, standards deviations, frequencies and percentages) of the participants and disease

were calculated. Multiple linear regression was used to measure the association between total DLQI score and multiple independent variables (socio-demographic and disease characteristics).

Results

Sociodemographic features of patients are represented in the Table 1.

Table 1. The sociodemographic features of the patients

Item	Subcategory	Frequency (N)	%
Gender	Male	188	62.7
	Female	112	37.3
Education level	Illiterate	20	6.7
	Primary school	84	28.0
	Secondary school	104	34.7
	College degree	92	30.7
Social status	Single	80	26.7
	Married	207	69.0
	Divorced	8	2.7
	Widow	5	1.7
Having children	Yes	106	35.3
	No	194	64.7
Living Place	Rural	46	15.3
	Urban	254	84.7
Work Status	Employee	92	30.7
	Student	26	8.7
	Retired	91	30.3
	Self-employed	6	2.0
	Wife House	85	28.3
Monthly income (Iraqi million dinars)	< 0.5	117	39.1
	0.5-1.0	84	28.1
	> 1.0	98	32.8
Smoker	Yes	84	28.0
	No	216	72.0
Alcohol drinker	Yes	17	5.7
	No	283	94.3

The most common type of psoriasis was vulgaris (77.7%) which followed by erythrodermic and psoriatic arthritis types (6.3%) (Figure 1).
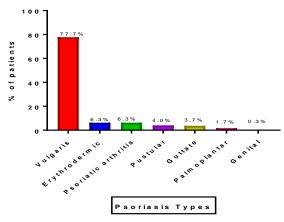

Figure 1. The types of psoriasis affected the participating patients

The most commonly used medications to treat psoriasis were topical steroids (63%), systemic etanercept (biological therapy) (61.7%) and vaseline (41.3%) (Table 2).

Table 2. The prescribed medications to treat psoriasis

Medication	Frequency (N)	Percent (%)
Topical steroids	189	63.0
Vaseline	124	41.3
Phototherapy	7	2.3
Cinnamon shampoo	6	2.0
Zinc oxide ointment	6	2.0
Topical calcineurin inhibitors	3	1.0
Topical coal tar	2	0.7
Systemic treatment		
Etanercept	185	61.7
Methotrexate	68	22.7
Folic acid	68	22.7
Cyclosporine	17	5.7
Acitretin	5	1.7
Antihistamines	6	2
Isoniazid	1	0.3
Aprelimast	1	0.3
Adalimumab	1	0.3

Although the averages PASI and BSA were not high, the psoriasis had very large effect on about half of the patient (49.3%) quality of life (average DLQI=11.29) (Table 3 and Figure 2).

Table 3 Descriptive characteristics of the disease and patients.

Characteristic	Minimum	Maximum	Mean	Std. Deviation
Disease duration (years)	0.5	43.0	13.12	8.60
Total DLQI	0	25.0	11.29	5.45
Severity index (PASI)	0.5	36.0	8.74	7.15
Body surface area (m^2)	1.0	90.0	17.25	17.39

Total N=300. **DLQI** =Dermatology Life Quality Index. **PASI** =Psoriasis area severity index..
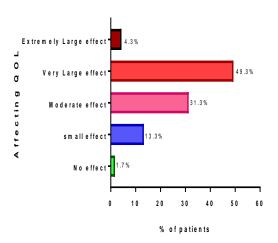
Figure 2. Effects of the disease severity on patient quality of life

The total scores with their sub-scores of patient's DLQI are shown in Table 4. Since the average of total DLQI scores was more than 10 (11.2±5.49), that indicates that the patient's QOL is being seriously impacted by their skin disease.

Table 4. The means of Dermatology Life Quality Index (DLQI)

Item	Mean	Std. Deviation
"Symptoms and feelings"	1.66	0.75
"Daily activities"	1.5	1.52
"Leisure activities"	0.71	0.77
"Going to work and school"	0.63	0.66
"Personal relationships"	0.51	0.65
"Treatment difficulties"	1.61	0.97
"Total DLQI score"	11.20	5.49

According o DLQI, more than half of the participants experienced itchy, sore, painful, stinging skin (55.7%) and/or embarrassment due to the skin disease (56.0%) in the last week. Consequently, the skin disease (psoriasis) negatively impacted many patients' daily activities (48.3%), clothes wearing (63.4%) and even social/leisure activities (36.6%). Additionally, psoriasis disease prevented about one-quarter of the patients from going to work or studying (23%) and caused work/study problems for another third (34.7%) of the participants. More than half of the participants admitted that psoriasis made their home messy (57.3%) over the last week. However, the disease had low impact on patients' sexual activities (8.7%) and their relations with close friends (20%) (Table 5).

Table 5. Patients answers to dermatology Life Quality Index (DLQI)

Disease consequences in the last week	Not at all, N (%)	A little, N (%)	A lot, N (%)	Very much, N (%)	Not relevant, N (%)
Itchy, sore, painful or stinging skin	17 (5.7)	**116 (38.7)**	104 (34.7)	63 (21.0)	-
Embarrassment due to the skin disease	51 (17.0)	81 (27.0)	**102 (34.0)**	66 (22.0)	-
Skin interference with shopping or looking after home/garden	67 (22.3)	88 (29.3)	**109 (36.3)**	36 (12.0)	-
Skin influences the clothes wearing	53 (17.7)	57 (19.0)	**125 (41.7)**	65 (21.7)	-
Skin effects on any social or leisure activities	**113 (37.7)**	76 (25.3)	64 (21.3)	46 (15.3)	1 (0.3)
Skin influences on sport/exercise	75 (25.0)	31 (10.3)	20 (6.7)	10 (3.3)	**164 (54.7)**
Skin prevents you from working/ studying.	**No 144 (48.0)**	Yes 69 (23.0)			87 (29.0)
Skin causes a problem at work/ studying	**94 (65.3)**	39 (27.1)	11 (7.6)	-	
Skin creates problems with your partner or any close friends/ relatives	**179 (59.9)**	55 (18.4)	47 (15.7)	13 (4.3)	5 (1.7)
Skin causes any sexual difficulties	**149 (49.8)**	44 (14.7)	15 (5.0)	11 (3.7)	80 (26.8)
The treatment for your skin making your home messy	47 (15.7)	79 (26.3)	**115 (38.3)**	57 (19.0)	2 (0.7)

Multiple linear regression analyses were used to measure the association between different socio-demographic and disease characteristics (independent variables) and total DLQI score (dependent variables) of the participants. Age, monthly income and vulgaris type of psoriasis have significant negative association with total DLQI score. While PASI has significant positive association with the total DLQI score (Table 6).

Table 6. Association of total DLQI score with socio-demographic and disease characteristics variables of the participants

	Total DLQI score	
	ßeta Coefficients	**P-value**
Age	-.135	**.048***
Gender		NS
social status	.074	.273
Having children		NS
Educational level		NS
Living place		NS
Work status		NS
Monthly income	-.161	**.006***
Smoker	.067	.314
Alcohol drinker	.043	.470
PASI	3.075	**.002***
BSA(m^2)	.301	.764
Face included	1.966	.050
Disease duration(yrs.)	.340	.734
Types of psoriasis	-.163	**.005***
Biologics	.003	.959

BSA=Body surface area; **PASI** (Psoriasis Area Surface Index). *Significant association (P-value < 0.05). Gender (0=female vs 1 =male). **NS**=non-significant (P-value > 0.05). We excluded some highly non-significant variables (P-value > 0.6) (without mentioning ß) in some regression analyses to fit the model better. Types of psoriasis is binary variable = (0= non-vulgaris / 1= vulgaris).

Discussion

Psoriasis is a serious dermatological disease extending beyond the physical symptoms experienced by the patient, and seriously affecting the way in which the patient sees him /herself and the way he/she is seen by others. [28]
In general, the commonly used measures of psoriasis activity are PASI and BSA. [29] The most widely used QOL questionnaire is the DLQI which is short and easy to use. [30] In the current study, more than one-half (53.7%) of the patients had a DLQI score of more than 10, which is more than that reported by a study done by Azura Mohd. *et. al*, where about 33.1% of patients had a DLQI score greater than 10, [4] which indicates a more deterioration in QOL for patients involved in the current study. The mean of total DLQI score is (11.29± 5.45) which is higher than that reported by Cacilda S. *et. al*, where the mean of DLQI score was (6.5 ± 6.9). [31]
The largest impact was found in symptoms and feelings domain (mean score = 1.66±0.75). Similar findings were illustrated by Cacilda S. *et. al*, and Nilce´ia Lopes. *et. al*, where the greatest effect was noted for symptoms and feelings domain, asserting that emotion play an essential role in the QOL of patients with psoriasis, because the skin is largely responsible for an patient's appearance. [1, 31] This mean that psoriasis has been associated with painful feelings of social anxiety and stigmatization, and fear of rejection. [32]
The lowest impact was noted in personal relationships (score = 0.51± 0.65) which may be related to the fact that psoriasis is not contagious, so that the patient's family and partner can help patients and encourage them to face the disease and come with them to doctor and take medication. In contrast to the result of the current study, a study done in Brazil by Nilce´ia Lopes. *et. al*., showed that the lowest impact was in work and school. [1]
In addition, the majority of the studied patients did not feel embarrassed during sexual activities regardless of the disease severity which is similar to the result reported by Amany Youssef. *et. al*. [28] This may be due that most husbands (wives) understand the non-infectious nature of the disease and encourage their husbands(wives) to cure and recover. However; contrary to current results, Głowacka *et. al*., illustrated that psoriasis limit patients' sexual life because of their embarrassment [28].
Studying the association between total DLQI score with various socio-demographic and disease characteristics variables of the participants revealed a significant negative association between age and total DLQI score (Table 6). Similar finding had been reported from a study done in Korea by Sang Woong Youn. *et. al*. [29] This may be explained by that younger patients pay more attention to their shape than elderly patients, so the disease effect on their QOL is greater. However; results of study done

by Amany Youssef. *et. al*., illustrated that age played insignificant role. [28] Additionally, it was noted that patients with higher income was significantly associated with lower total DLQI score which mean better QOL (Table 6). Patients with higher monthly income can buy expensive medications which may be unavailable at public hospitals all the time and this might be reflected positively on their QOL. The results of this study showed a direct association between PASI and total DLQI score (Table 6), which is similar to the study done in Korea by Sang Woong Youn. *et. al*., where a greater impairment in QOL showed in patients with more severe psoriasis. [29] The predominant psoriasis type was plaque psoriasis (77.7%), which is consistent to the other studies done by Liliana G. *et. al*., [32] and Azura Mohd. *et. al.* [4], where the plaque psoriasis was the most common type of psoriasis. Vulgaris type of psoriasis has negative association with total score of DLQI, this means that vulgaris type has lower negative effect on QOL. This may be explained by the natural course of each type. For example, erythrodermic psoriasis is characterized by abrupt development of erythematous, inflammatory skin plaques with edema [33]. Also the pustular type is a potentially life-threatening variant of psoriasis characterized by a sudden and widespread development of superficial pustules that lead to bad appearance and cause anxiety and restlessness. [34-36]. In addition, psoriatic arthritis can cause irreversible damage to joints and supporting tissue. [37] which might be reflected negatively on quality of life of patients.

Conclusions

In conclusion, results of the current study document that psoriasis can exerts a significant, negative impact on patients' QOL, especially among those with younger age, lower monthly income, high disease activity, and types of psoriasis other than vulgaris. Accordingly, routine assessment is recommended for patients with psoriasis to detect and monitor the impact of the disease and treatment on patients' QOL with subsequent development of care plan to improve it especially in severely affected patients.

Limitations of the study

The first limitation was incorporating psoriatic patients from only one center in Baghdad city, so the data does not fully represent all Iraqi patients. In addition, the cross-sectional nature of the study makes it impossible to confirm causal conclusions.

References

1. Lopes N, Dias L, Azulay-Abulafia L, Oyafuso L, Suarez M, Fabricio L,et al., Humanistic and Economic Impact of Moderate to Severe Plaque Psoriasis in Brazil. Adv. Ther. 2019;36(10):2849–65.
2. Tollefson MM, Van Houten HK, Asante D, Yao X, Kremers HM. Association of psoriasis with comorbidity development in children with psoriasis. JAMA dermatology. 2018;154(3):286-92.
3. Ljubenovic M, Lazarevic V, Golubovic M, Binic I. Integrative Approach to Psoriasis Vulgaris. Holist. Nurs. Pract. 2018 ;1;32(3):133-9.
4. 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.
5. Al-Dhalimi MA, Al-Sahlawee MM, Al-Esawee HK. Correlation of leptin with severity of plaque psoriasis in Iraqi male patients. Journal of University of Babylon. 2016;24(5):1461-8.
6. Takeshita J, Grewal S, Langan SM, Mehta NN, Ogdie A, Van Voorhees AS, et al. Psoriasis and comorbid diseases: epidemiology. J. Am. Acad. Dermatol. 2017 ; 1;76(3):377-90.
7. Alidrisi HA, Al Hamdi K, Mansour AA. Is There Any Association Between Psoriasis and Hashimoto's Thyroiditis?. Cureus. 2019;11(3).
8. Ahronowitz I, Fox L. Severe drug-induced dermatoses. Semin. Cutan. Med. Surg. 2014 ;33(1):49-58.
9. Kim SY, Min C, Oh DJ, Choi HG. Increased risk of psoriasis in children and elderly patients with asthma: a longitudinal follow-up study using a national sample cohort. Int. Forum Allergy Rhinol. 2019 ; 9(11): 1304-1310.
10. Darjani A, Heidarzadeh A, Golchai J, Sadr-Eshkevari S, Alizadeh N, Arami M, et al. Quality of life in psoriatic patients: a study using the short form-36. Int. J. Prev. Med. 2014;5(9):1146.
11. Moradi M,et al.Health-related quality of life and disease burden of psoriasis in Iran [thesis]. Enschede:Corvinus University of Budapest ,2017:1-168.
12. Damiani G, Cazzaniga S, Conic RR, Naldi L, Psocare Registry Network, Griseta V, et al. Pruritus characteristics in a large Italian cohort of psoriatic patients. J. Eur. Acad. Dermatology Venereol.. 2019;33(7):1316-24.
13. Mantovani L, Medaglia M, Piacentini P, Tricca M, Vena GA, Vozza A, Castellino G, Roccia A. Burden of moderate-to-severe plaque psoriasis and new therapeutic approaches (secukinumab): an Italian perspective. Dermatol. Ther. 2016;6(2):151-67.
14. Van de Kerkhof PC, Loewe R, Mrowietz U, Falques M, Pau-Charles I, Szepietowski JC. Quality of life outcomes in adults with moderate-to-severe plaque psoriasis treated with dimethylfumarate (DMF): a post hoc analysis of the BRIDGE study. J. Eur. Acad. Dermatology Venereol.2020;34(1):119-26.

15. Martin G, Young M, Aldredge L. Recommendations for initiating systemic therapy in patients with psoriasis. J. Clin. Aesthet. Dermatol. 2019;12(4):13.

16. Aldredge LM, Higham RC. Manifestations and Management of Difficult-to-Treat Psoriasis. J. Dermatol. Nurses. Assoc. 2018;10(4):189-97.

17. Otero ME, Van Den Reek JM, Van De Kerkhof P, Mertens JS, Seyger M, Kievit W, et al Beliefs About Medicines in Patients with Psoriasis Treated with Methotrexate or Biologics: A Cross-sectional Survey Study. Acta Derm. Venereol. 2019;99(3):386-92.

18. Plachouri KM, Georgiou S. Challenges in the treatment of psoriasis with biologics: vaccination, history of malignancy, human immunodeficiency virus (HIV) infection, and pediatric psoriasis. Int. J. Dermatol. 2019;58(9):1008-13.

19. Ighani A, Yu AM, Sandhu VK, Barankin B, Manolson MF. Satisfaction and Awareness of Systemic Psoriasis Treatments: A National Survey Comparing Biologic and Nonbiologic Users. J. Cutan. Med. Surg. 2019;23(2):148-56.

20. Hussein WA. The quality of life in patients with rheumatoid arthritis in Baghdad, 2017: a cross-sectional study. Int. J. Med. Res. Heal. Sci. 2017;6(11):20-34.

21. Al-ibrahimy AS and Al-Tukmagi HF. Assessing Quality of Life Among Patients with Diabetes Mellitus, Hypertension or Both Diseases in Al-Najaf Province/Iraq. Iraqi J Pharm Sci. 2017 ; 25:29-40.

22. Strober B, Greenberg JD, Karki C, Mason M, Guo N, Hur P, et al. Impact of psoriasis severity on patient-reported clinical symptoms, health-related quality of life and work productivity among US patients: real-world data from the Corrona Psoriasis Registry. BMJ open. 2019;9(4):e027535.

23. Wang H, Chan HH, Ni MY, Lam WW, Chan WM, Pang H. Bacteriophage of the Skin Microbiome in Patients with Psoriasis and Healthy Family Controls. J. Invest. Dermatol. 2020;140(1):182-90.

24. DiBonaventura M, Carvalho AV, Souza CD, Squiassi HB, Ferreira CN. The association between psoriasis and health-related quality of life, work productivity, and healthcare resource use in Brazil. Anais brasileiros de dermatologia. 2018;93(2):197-204.

25. Armstrong AW, Ford AR, Chambers CJ, Maverakis E, Dunnick CA, Chren MM, et al. Online Care Versus In-Person Care for Improving Quality of Life in Psoriasis: A Randomized Controlled Equivalency Trial. J. Invest. Dermatol. 2019;139(5):1037-44.

26. Rencz F, Brodszky V, Gulácsi L, Péntek M, Poór AK, Holló P, et al. Time to revise the Dermatology Life Quality Index scoring in psoriasis treatment guidelines. J. Eur. Acad. Dermatology Venereol 2019;33(7):e267-9.

27. Rastogi MK, Mohan R, Gahalaut P, Mishra N, Thapa M. Effect of topical steroid-dependent facial dermatitis on quality of life: A hospital-based cross-sectional study using DLQI. Indian J of dermatology. 2019;64(6):465-70.

28. Sharaf AY and Ibrahim AF. Quality of life of patients with Psoriasis in Alexandria-Egypt. IOSR J. Nurs. Heal. Sci.2017;6 (1):17–29.

29. Youn SW, Lee JH, Yu DY, Kim Y, Kim BS, Seo SJ, et al. The relationship between clinical characteristics including presence of exposed lesions and health-related quality of life (HRQoL) in patients with psoriasis: analysis from the nationwide epidemiologic study for psoriasis in Korea (EPI-PSODE study). Journal of the European Academy of Dermatology and Venereology. 2018;32(9):1499-506.

30. Lizán L, Gabás-Rivera C, Belinchón I, Dilla T, Huete T, Díaz S. Patient-reported outcomes assessment tools for use in psoriasis in Spain: A systematic review. Actas Dermo-Sifiliográficas,English Ed. 2019;110(7):561-84.

31. Souza CS, de CASTRO CC, Carneiro FR, Pinto JM, Fabricio LH, Azulay-Abulafia L et al. Metabolic syndrome and psoriatic arthritis among patients with psoriasis vulgaris: Quality of life and prevalence. J. Dermatol. 2019;46(1):3-10.

32. Jankovic S, Raznatovic M, Marinkovic J, Jankovic J, Kocev N, Tomic-Spiric V,et al. Health-related quality of life in patients with psoriasis. J. Cutan Med. Surg. 2011;15(1):29-36.

33. Rendo M, Boster J, Dalton SR, Yun H. An Uncommon Presentation of Erythrodermic Psoriasis in a Patient Without a History of Psoriasis. Cureus. 2019;11(7).

34. Ly K, Beck KM, Smith MP, Thibodeaux Q, Bhutani T. Diagnosis and screening of patients with generalized pustular psoriasis. Psoriasis: Targets Ther. 2019;9:37-42.

35. Gooderham MJ, Van Voorhees AS, Lebwohl MG. An update on generalized pustular psoriasis Expert Rev. Clin. Immunol. 2019 2;15(9):907-19.

36. Twelves S, Mostafa A, Dand N, Burri E, Farkas K, Wilson R, et al. Clinical and genetic differences between pustular psoriasis subtypes. J. Allergy Clin. Immunol. 2019;143(3):1021-6.

37. Kaine J, Song X, Kim G, Hur P, Palmer JB. Higher incidence rates of comorbidities in patients with psoriatic arthritis compared with the general population using US administrative claims data. J Manag Care Spec Pharm. 2019;25(1):122-32.