Dermatology Practical & Conceptual

Dermatology Quality of Life and Depression, Anxiety, and Stress Scale-42 in Scabies Patients

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ABSTRACT

Introduction: Scabies is a pruritic skin infestation with a globally increasing prevalence. Sleep problems and impaired social and personal interactions, mainly due to itching, have been reported.

Objectives: We aimed to determine the influence of scabies on quality of life and psychosocial health using Dermatology Life Quality Index (DLQI) and Depression Anxiety and Stress Scale-42 (DASS-42) and analyze whether there is a correlation between the two scales and any sociodemographic and clinical characteristic.

Methods: Scabies patients (>16 years) who presented to our outpatient clinics were enrolled. Age, sex, occupation, marital status, and education level and clinical features were recorded. DLQI and DASS-42 were used. Possible influence of demographic and clinical characteristics on total scores were analyzed. The Spearman coefficient analysis was performed to determine whether there is a correlation between these scores.

Results: Of 92 patients (mean age:37.76±15.355, Female/Male: 1.09/1), 63% were married and 35.9% were high-school graduates; 27.2% and 23.9% were housewives and officers, respectively. Disease was generalized in 57.6% and duration of disease was mostly <4 weeks. Mean DLQI and DASS-42 scores were 13.16±7.638 and 42.10±30.644, respectively. Symptoms/feelings were affected predominantly. DLQI was affected 'severely' in 41.3% of patients.

Conclusions: Impairment of DLQI is a significant predictive parameter for higher DASS levels. Scabies is not only associated with impairment in DLQI but may also lead to psychosocial problems. All scabies patients should be evaluated and consulted–if needed–for possible problems of psychosocial status, including depression, anxiety, and stress, as well as clinical symptoms and secondary complications.

Introduction

Scabies is a pruritic skin infestation caused by an ectoparasite *Sarcoptes scabiei var. hominis* presenting with itchy lesions characteristically located on the web spaces of fingers, volar surfaces of wrists, inner thighs, umbilicus, areolae in women, and genitalia in men. Prolonged skin contact, usually more than 10 minutes, particularly among family members and/or sexual partners, is the most common mode of transmission. Handshakes, hugging, and casual touching are very rare modes of transmission. Diagnosis is usually made clinically. Dermoscopic and/or microscopic evaluation to detect feces, eggs, or even mites may be used to confirm the diagnosis [1,2].

The disease has been reported to cause 71 disability-adjusted life years (DALY)/100,000 people, contributing to 0.21% DALYs from all of the 315 conditions studied by the Global Burden of Disease in 2015 worldwide [2]. The protective skin barrier may be impaired due to severe pruritus, and secondary cutaneous bacterial infections and even some life-threatening conditions, including renal and cardiac diseases, have been reported particularly among immunocompromised patients [3]. Scabies not only causes pruritus and cutaneous signs but may also lead to impairment in the quality of life (QOL) of patients and even lead to social and psychological problems. Insomnia, a decrease in the quality of sleep, and negative influence on daily activities due to pruritus have been reported. Patients cannot go to work or school, may be stigmatized or excluded, or may face communication problems with friends and/or partners throughout the therapy period due both to the symptoms and to therapeutic methods including topical ointments with an unpleasant odor [3-4].

Dermatology Life Quality Index (DLQI) has increasingly been used in many dermatological conditions recently. It gives very important data both to predict the therapeutic results and the prognosis of the dermatoses [5]. The Depression, Anxiety and Stress Scale-42 (DASS-42) is a scale measuring three subscales–depression, anxiety and stress–both dimensionally and categorically and discriminates each in the same questionnaire [6]. DASS-42 or its shorter version (DASS-21) have previously been used in a few dermatoses, including oral lichen planus, eczema, and atopic dermatitis, as well as in specific populations such as employees, dermatologists, secondary school girls, and adolescent refugees [7-16].

There are only three studies investigating the relationship between QOL and psychological status of scabies patients using various scales, including Beck's Depression Scale (BDS), Beck's Anxiety Inventory (BAI), Hamilton Anxiety Rating Scale (HAM-A), Zung Self-Rating Depression Scale (SDS), and Zung Self-Reporting Anxiety Scale (SAS) [17-20]. In this study, we aimed to investigate the psychological burden of this disease using DASS-42 Scale and its possible correlation with DLQI results and also to determine whether any sociodemographic and clinical characteristics of the patients are related with these results.

Methods

We conducted a prospective and descriptive survey study after obtaining ethical clearance from the local ethics committee. All the patients who presented to our dermatology outpatient clinics between January and June 2023, aged ≥16 years, capable of writing, reading, and understanding a given questionnaire, and diagnosed as having scabies clinically and/or dermoscopically were enrolled. The exclusion criteria were pregnancy/lactation, any doubt about the clinical diagnosis, atypical forms of scabies (Norwegian Gale), being <16 years, chronic dermatological and systemic diseases (diabetes, hypertension, asthma, epilepsy, acne and psoriasis), or using any mood-altering drugs.

Patients' age, sex, education level, marital status, occupation, and clinical characteristics such as distribution of lesions and duration of symptoms were recorded. The disease was categorized as 'localized' if lesions were located on <3 regions and 'generalized' if lesions were located on ≥3 regions.

After an informed consent form was signed by the patients and sociodemographic parameters were recorded, the patients were asked to complete the questionnaires of the Dermatology Life Quality Index (DLQI) and the Depression Anxiety and Stress Scale-42 (DASS-42).

DLQI was first developed by Finlay et al. as a questionnaire consisting of 10 items; it has been validated in more than 40 dermatological disease [5]. We used the validated Turkish version of this index [21]. There are 10 questions about the patient's symptoms/feelings (questions 1–2), daily activities (questions 3–4), leisure and sports activities (questions 5–6), work and/or school (question 7), personal interactions (questions 8–9), and therapeutic challenges (question 10). The patient is asked to choose one of the 4 or 5 answers for every question. The answers are categorized as follows: very much-3, much-2, little-1, not much-0, not relevant-0, and unanswered question-0. All the points are summed, and a total score ranging from between 0 and 30 is achieved. The higher the score, the more the patient's quality of life (DLQI) is impaired. The range of scores are categorized as follows: 0–1= DLQI is not affected, 2–5= DLQI is mildly affected, 6–10= DLQI is moderately affected, 11–20=DLQI is severely affected, and 21–30=DLQI is very severely affected.

The DASS-42 is a 42-item questionnaire consisting of three subscales within 14 items, and a Likert-type evaluation is made (0=never, 1=sometimes, 2=very often, 3=always). It is an easy, short self-report questionnaire designed to evaluate the presence and severity of depression, anxiety, and stress in patients ≥ 16 years of age [6]. The patients are asked to reply to the questions considering the previous week. The total score is achieved after summing all the scores. Normal range is 0–9 for depression, 0–7 for anxiety, and 0–14 for stress. We used the Turkish version of the scale, which was modified slightly for the Turkish population [22].

Sample and Sample Size

Sample size was determined using PASS (NCSS Corp. Released 2011. Power Analyzes Sample Size for Windows, Version 11.0. Utah, USA) Pocket Programme. The average score of DLQI in the reference trial is 14.5±4.5. A sample size of 91 achieves 90% power to detect a difference of -1.6 between the null hypothesis mean of 15.0 and the alternative hypothesis mean of 16.5, with an estimated standard deviation of 4.5 and with a significance level (alpha) of 0.05000 using a two-sided one-sample t-test.

Statistical Methods

Collected data were analyzed using IBM Statistical Package for the Social Sciences (SPSS) for Windows 23.0 (IBM Corp, Armonk, NY). Frequency and percentages for categorical data, and mean, standard deviation, median, and minimum and maximum descriptive values were used for continuous data. Kolmogorov-Smirnov Test was used to analyze normality test of data. The independent samples t-test for comparison of two groups with normal distribution, the Mann Whitney-U test for comparison of two groups without normal distribution, the ANOVA Test for comparison of more than two groups with normal distribution, and the Kruskal-Wallis H test for comparison of more than two groups without normal distribution were used. In the comparison of categorical variables, Fisher's exact test or the chi-squared test, and Pearson or Spearman's correlation test" in determination of interaction between scale scores were used. Level of significance was set at $P<0.05$.

Results

Ninety-two patients were enrolled in the study. The median age of participants was 36 years (min-max, 18-84 years), with a slight predominance of females (n=48, 52.2%). The majority of the patients were aged between 16 and 35 years (48.9%), and 63% of the patients were married. The patients were mostly high school (35.9%, n=33) and university graduates (22.8%, n=21). Housewives and officers were the largest groups (27.2%, n=25 and 23.9%, n=22, respectively) (Table 1).

Table 1. Demographic characteristics of patients.

Variable		N	%
Age (years)	16-35	45	48.9
	36-55	29	31.5
	>55	18	19.6
Sex	Male	44	47.8
	Female	48	52.2
Marital status	Single	34	37
	Married	58	63
Occupation	Officer	22	23.9
	Student	9	9.8
	Worker	17	18.5
	Housewife	25	27.2
	Other	19	20.7
Education level	Lit.- primary	19	20.7
	Middle	19	20.7
	High	33	35.9
	University	21	22.8

Table 2. Clinical characteristics of patients.

Variable		n	%
Involvement	Generalized	53	57.6
	Localized	39	42.4
Duration	>12 weeks	21	22.8
	4-12 weeks	28	30.4
	<4 weeks	43	46.7

Generalized disease was noted more than localized disease (57.6% vs 42.4%, respectively). Duration of the disease was mostly less than four weeks (46.7%) (Table 2).

The mean DLQI was 13.16±7.638. DLQI was 'affected severely' in 41.3% (n=38) of patients. The most affected domain of DLQI was symptoms/feelings (mean 3.89±1.593), followed by difficulties at work/school (mean 2.25±2.058). The mean±SD of the total DASS score was 42.10±30.644 (with subgroups of depression 13.11±11.595, anxiety 12.13±9, and stress 16.95±11.291) (Table 3).

Although not statistically significant, DLQI was affected more in patients >55 years, males (13.68±7.172), singles (13.47±6.934), officers (14.91±6.921), and those with higher education level (14.21±7.749) in comparison to other groups of age, sex, occupation, and education

Table 3. Statistics of total and subgroups of DASS-42 and domains and subgroups of DLQI.

Variables		Mean±SD
DASS-42	Total	42.10±30.644
	Depression	13.11±11.595
	Anxiety	12.13±9.216
	Stress	16.95±11.291
DLQI (domains)	Total	13.16±7.638
	Symptoms and feelings	3.89±1.593
	Daily activities	2.09±1.954
	Leisure	1.98±1.898
	Relationships	1.64±1.289
	Work-school	2.25±2.058
	Therapeutic challenge	1.32±1.119
DLQI (subgroups)		**n (%)**
	Very severely affected	18 (19.6)
	Severely affected	38 (41.3)
	Moderately affected	18 (19.6)
	Mildly affected	13 (14.1)
	Unaffected	5 (5.4)

levels. On the other hand, it was found that DLQI was significantly affected in patients with general involvement (16.06±7.159) and >12 weeks of duration (17.81±7.012) (P<0.05) (Table 4).

For total DASS-42 score, depression, anxiety, and stress levels were significantly higher in patients >55 years (P=0.035), patients with generalized involvement (P<0.001), and patients with a duration of >12 weeks (P<0.001), respectively. However, no significant difference was observed among other demographic and clinical characteristics, including sex, marital status, occupation, and education level (Table 5).

DLQI of patients were mostly affected severely (median 42) and very severely (median 77). DLQI of patients who experienced very severe depression (15.2%), anxiety (17.4%), and stress (12%) were affected very severely (64.3%, 50%, and 63.6%, respectively) (Table 6).

Patients with very severe depression, anxiety, and stress had higher scores of DLQI in comparison with other groups (21.43±4.735, 18.88±7.710 and 21.91±5.088, respectively) (Table 7).

Spearman correlation coefficient analysis revealed a positive and significant correlation between total DLQI score and total (r_s =0.582) and subgroups of DASS-42 (depression (r_s=0.618), anxiety (r_s =0.508), and stress level (r_s =0.553) scores, respectively) (P<0.001) (Table 8).

Discussion

Scabies is a pruritic and contagious dermatosis which has been reported to have affected 2.8% of the population in the year 2015. A total increase of 6.6% in the incidence of scabies between the years of 2005-2015 has been estimated [24]. In a recent study, it was emphasized that movements of people, including tourists and immigrants in Croatia, may have had a possible influence on scabies movements [25]. An approximate 30-fold increase in prevalence comparing the years 2017 and 2019 has been noted in our country [26]. Ural et al. reported that the COVID-19 pandemic period has also contributed [27]. We think this may have been even more prominent during recent months probably due to low socioeconomic level and poor hygiene conditions, which may have unfortunately worsened after the increasing number of immigrants and the earthquake in southeastern, leading to thousands of victims.

Skin diseases are important risk factors for emotional stress, acute anxiety, and mood disorders, sometimes even affecting the therapeutic response and course of the disease. Shahbaz et al. [28] demonstrated that QoL in patients with various dermatoses on exposed parts is impaired. The negative influence of both symptoms and therapeutic challenges on the quality of life of scabies patients and/or their family members has also been well-established [1, 3, 4, 17, 29].

The psychological burden of many dermatoses, including psoriasis, vitiligo, acne, atopic dermatitis, seborrheic dermatosis, psoriasis, eczema, hidradenitis suppurativa, oral lichen planus, alopecia, steroid-resistant dermatitis, and chronic pruritus, has been thoroughly investigated previously [7-11, 19, 23]. There are only three studies analyzing the correlation between DLQI and psychological consequences of scabies, in which DLQI and various psychometric, including BDS/ BAS, HAM-A and SAS/ SDS, were used [17, 18, 20]. Here, we investigated the impact of this disturbing disease on the patients' psychological health using DASS-42 and analyzed its possible correlation with DLQI results.

Bilal et al. [1] stated that the feeling of embarrassment and shopping were the most affected domains in their male patients (58.9%). The domains affected predominantly were shopping, clothing, and work activities, which they concluded may reflect the young, active age group living in urban areas. In a study of 102 scabies patients, Nair et al. [3] concluded that scabies can affect DLQI in the form of work, sleep disturbances, and psychosocial problems both in patients and their family members. The most common age group was 21-40 years, with a predominance of students and housewives, and the major domain affected was work activity (74.2%), followed by feeling of embarrassment (64.5%). In another study of 120 scabies patients, difficulty at work was mostly experienced, followed by feelings of

Table 4. Distribution of demographic and clinical characteristics according to means of DLQI.

Variables	Categories	n (%)	DLQI Mean±SD	P*
Age	16-35	45 (48.9)	13.76±7.517	0.473
	36-55	29 (31.5)	11.72±8.293	
	>55	18 (19.6)	14±6.894	
Sex	Male	44 (47.8)	13.68±7.172	0.536
	Female	48 (52.2)	12.69±8.088	
Marital status	Single	34 (37)	13.47±6.934	0.488
	Married	58 (63)	12.98±8. 075	
Occupation	Officer	22 (23.9)	14.91±6.921	0.651
	Student	9 (9.8)	11.22±6.723	
	Worker	17 (18.5)	12.29±7.769	
	Housewife	25 (27.2)	12.28±8.106	
	Other	19 (20.7)	14±8.731	
Education level	Lit.-Primary	19 (20.7)	13.16±8.995	
	Middle	19 (20.7)	11.53±6.266	0.688
	High	33 (35.9)	14.21±7.749	
	University	21 (22.8)	13±7.537	
Involvement	Generalized	53 (57.6)	16.06±7.159	<0.001
	Localized	39 (42.4)	9.23±6.483	
Duration	>12 weeks	21 (22.8)	17.81±7.012	
	4-12 weeks	28 (30.4)	13.29±7.049	0.002
	<4 weeks	43 (46.7)	10.81±7.388	

embarrassment and social relationships. The patients were aged mostly 18–30 years [4]. Similarly, in the present study, the majority of the patients were aged between 16 and 35 years (48.9%), with a predominance of housewives and officers, and the most affected domain was symptoms and feelings (mean: 3.89±1.593), followed by difficulties at work and school (mean 2.25±2.058).

The mean DLQI score of our study population was 13.16±7.638. This value was in concordance with the previous studies of DLQI in scabies, which reported mean DLQI values of between 10.09 and 14.95±4.5 [1, 17, 30].

There have been studies reporting a small-to-moderate effect of scabies on DLQI [3, 30, 32-34]. On the other hand, in one study, DLQI in 72.2% of patients was moderate-to-extremely affected. DLQI was 'affected severely' in 41.3% (n=38) of our patients, similar to most of the previous studies [1,17]. A mild effect was reported only in one study performed in rural areas, and the authors concluded that this may be attributable to the fact that the QoL is so poor that people do not consider scabies as a problem at all [32].

The mean±SD DASS-42 score in our study was 42.10±30.644 (depression 13.11±11.595, anxiety 12.13±9.216, and stress 16.95±11.291). Guo et al. [23] investigated the factors influencing QoL, depression and anxiety of patients with skin diseases, and the correlation between the three using DLQI, and SAS, and SDS. They concluded that psoriasis, acne, atopic dermatitis, steroid-dependent dermatitis, and alopecia have a certain impact on QoL of most patients and may cause different degrees of anxiety and depression. Sun et al. [19] observed a strong correlation between skin diseases-neurodermatitis, eczema, and psoriasis and anxiety using HAM-A scale and concluded that the likelihood of anxiety decreases as age increases. Although we also found a similar positive correlation between scabies and DASS-42 scores, patients older than 55 years were significantly more affected and had higher DASS-42 scores in our study. It is well established that certain populations including immunocompromised patients, children, the elderly, and patients with developmental disabilities have a higher risk of acquiring the disease and experiencing the complications. This may be attributed to the late onset of symptoms, particularly itching, leading to a delay in seeking medical care until the lesions are generalized since type 1 and delayed type 4 immune response, which normally develops in weeks 1–4 after infestation, may be impaired in these patients [2]. Indeed, it is postulated that the stress surrounding COVID-19 and

Table 5. Distribution of demographic characteristics according to total and subgroups of DASS-42 Score.

Variable	n	%	DASS-42			
			Total DASS	Depression	Anxiety	Stress
Age						
16-35	45	48.9	46.62±29.529	14.42±11.766	13.71±9.067	18.67±10.717
36-55	29	31.5	30.14±27.248	8.79±9.329	8.62±8.436	12.72±10.306
>55	18	19.6	50.06±34.374	16.78±12.941	13.83±9.691	19.44±12.858
	P*		**0.035**	**0.039**	**0.045**	**0.049**
Sex						
Male	44	47.8	38.61±32.407	12.20±12.320	10.48±9.586	16.16±12.069
Female	48	52.2	45.29±28.905	13.94±10.953	13.65±8.687	17.67±10.604
	P*		**0.229**	**0.477**	**0.100**	**0.525**
Marital status						
Single	34	37	48.65±33.189	15.26±12.745	14.59±10.284	19.09±11.948
Married	58	63	38.26±28.651	11.84±10.780	10.69±8.285	15.69±10.795
	P*		**0.117**	**0.173**	**0.052**	**0.165**
Occupation						
Officer	22	23.9	35.05±21.588	10.27±8.419	9.32±6.121	15.36±9.016
Student	9	9.8	57.00±41.728	18.44±16.569	16.67±13.416	23.00±13.711
Worker	17	18.5	38.41±29.424	11.76±10.651	11.47±8.449	15.18±11.706
Housewife	25	27.2	46.64±29.627	14.36±11.324	14.44±8.996	17.84±10.617
Other	19	20.7	40.53±35.692	13.42±13.234	10.79±10.228	16.32±12.966
	P*		**0.393**	**0.447**	**0.178**	**0.462**
Education						
Lit-primary	19	20.7	48.26±32.844	15.95±12.376	13.68±9.621	18.63±11.781
Middle	19	20.7	31.58±24.885	9.26±8.491	9.53±7.479	12.79±10.003
High	33	35.9	47.30±34.645	14.91±13.347	14.18±10.510	18.21±12.328
University	21	22.8	37.86±24.882	11.19±9.647	9.86±7.411	17.19±10.003
	P*		**0.23**	**0.20**	**0.17**	**0.34**
Involvement						
Generalized	53	57.6	58.62±27.093	18.64±11.016	17.06±8.570	23.08±9.579
Localized	39	42.4	19.64±18.596	5.59±7.429	5.44±4.800	8.62±7.489
	P*		**<0.001**	**<0.001**	**<0.001**	**<0.001**
Duration						
>12 weeks	21	22.8	64.33±31.614	21.33±11.573	18.76±10.554	24.24±10.881
4-12 weeks	28	30.4	51.29±31.037	17.25±12.447	13.93±8.726	20.39±11.519
<4 weeks	43	46.7	25.26±18.587	6.40±6.044	7.72±6.162	11.14±8.093
	P*		**<0.001**	**<0.001**	**<0.001**	**<0.001**
TOTAL	92	100	42.10±30.644	13.11±11.595	12.13±9.216	16.95±11.291

social isolation can have negative effects on mental stress in older people. Psychological stress has an impact on many skin diseases and can play a substantial role in exacerbating disease activity [31].

There are various studies on the demographic characteristics of patients with dermatoses and DLQI scores. Shahbaz et al. [28] reported a relation between sex, marital status, and duration of disease and DLQI in most dermatoses on exposed parts, including acne, hirsutism, melasma, vitiligo, and eczema. Yıldırım et al. [17] found no relationship between BDS/BAS and age, sex, education level, and duration of scabies. Similarly, Bilal et al. [1] reported a large effect of scabies on DLQI without any significant association with sociodemographic characteristics, including

Table 6. Distribution of subgroups of DLQI and DASS-42.

DLQI							
DASS-42		n (%)	Unaffected n (%)	Mildly affected n (%)	Moderately affected n (%)	Severely affected n (%)	Very severely affected n (%)
Total	Median (Min-Max)	92 (100)	10 9-33	9 0-61	26 1-80	42 4-95	77 19-126
Depression	Very severe	14 (15.2)	0	0	0	5 (35.7)	9 (64.3)
	Severe	10 (10.9)	0	0	2 (20)	6 (60)	2 (20)
	Moderate	12 (13)	0	1 (8.3)	3 (25)	6 (50)	2 (16.7)
	Mild	10 (10.9)	0	0	1 (10)	7 (70)	2 (20)
	Normal	46 (50)	5 (10.9)	12 (26.1)	12 (26.1)	14 (30.4)	3 (6.5)
Anxiety	Very severe	16 (17.4)	0	0	3 (18.8)	5 (31.3)	8 (50)
	Severe	20 (21.7)	0	1 (5)	3 (15)	12 (60)	4 (20)
	Moderate	14 (15.2)	1 (7.1)	1 (7.1)	3 (21.4)	7 (50)	2 (14.3)
	Mild	9 (9.8)	0	2 (22.2)	0	4 (44.4)	3 (33.3)
	Normal	33 (35.9	4 (12.1)	9 (27.3)	9 (27.3)	10 (30.3)	1 (3)
Stress	Very severe	11 (12)	0	0	0	4 (36.4)	7 (63.6)
	Severe	14 (15.2)	0	1 (7.1)	3 (21.4)	7 (50)	3 (21.4)
	Moderate	14 (15.2)	1 (7.1)	0	3 (21.4)	6 (42.9)	4 (28.6)
	Mild	11 (12)	0	1 (9.1)	3 (27.3)	5 (45.5)	2 (18.2)
	Normal	42 (45.7)	4 (9.5)	11 (26.2)	9 (21.4)	16 (38.1)	2 (4.8)

Table 7. Mean DLQI scores according to subgroups of DASS-42.

Variable	DASS-42					P*
	Very severe	Severe	Moderate	Mild	Normal	
DLQI (total score)	**Depression**					
	21.43±4.735	16±5.963	12.92±6.417	17.50±7. 059	9.15±6.6.377	<0.001
	Anxiety					
	18.88±7.710	15.40±6.303	12.71±6.911	14.89±7.184	8.76±6.462	<0.001
	Stress					
	21.91±5.088	15. 07±6.719	15.07±7.509	13.91±7.595	9.40±6.267	<0.001

age group, education level, and occupation. In the present study, although not significant statistically, DLQI was affected more in patients > 55 years, males (13.68±7.172), singles (13.47±6.934), officers (14.91±6.921), and those with higher education level (14.21±7.749) in comparison with other groups of age, sex, occupation, and education level. On the other hand, it was found that DLQI was significantly affected in patients with generalized involvement (16.06±7.159) and >12 weeks of duration (17.81±7.012) (P<0.05). Since older patients constituted a small group in our population, it is worth observing the greater impairment of DLQI in these patients. Increased and prolonged social isolation during the whole COVID-19 pandemic in addition to the unpleasant and impractical topical therapy of scabies, including long hours of ointments and self- and environmental cleaning, may have contributed to the extraordinary impairment of DLQI in the elderly.

Although there is limited evidence concerning the relation between duration of disease and DLQI in scabies patients, eight weeks of disease has been reported to influence the DLQI and burden of the disease in two studies [17, 31]. Although most of our patients had a duration less than four weeks, we observed a significant difference of DLQI in patients with longer duration. Patients with generalized disease and longer duration usually have more pruritus and secondary skin changes, including excoriations and cutaneous infections, possibly explain the greater impairment of DLQI.

For total DASS-42 score, depression, anxiety, and stress levels were significantly higher in patients > 55 years (P=0.035), with generalized involvement (P<0.001), and

Table 8. Spearman rho analysis demonstrating the relationship between DLQI and DASS-42 (total and subgroups).

		DLQI
DASS-42 Total	*Correlation coefficient*	.582**
	*P***	.000
Depresssion	*Correlation coefficient*	.618**
	*P***	.000
Anxiety	*Correlation coefficient*	.508**
	*P***	.000
Stress	*Correlation coefficient*	.553**
	*P***	.000
DLQI	*Correlation coefficient*	1.000
	*P***	

** Correlation is significant at the 0.01 level (2-tailed).

with duration of >12 weeks (P<0.001) in comparison with other age, involvement, and duration groups, respectively. However, no significant difference was observed among other demographic and clinical characteristics (sex, marital status, occupation, and education level). Although the mean duration of disease was predominantly <4 weeks, we observed that patients with >12 weeks of duration tended to have higher levels of depression, anxiety, and stress. In a recent cross-sectional study with a much longer mean duration of symptoms (5.9 months) than all previous studies and ours, scabies patients had more anxiety, depression, and impaired QoL and tended to have moderate-to-severe depression in comparison to controls [20].

DLQI of patients was mostly affected severely (median 42) and very severely (median 77). DLQI of patients with very severe depression (15.2%), anxiety (17.4%), and stress (12%) were affected very severely (64.3%, 50%, and 63.6%, respectively) and had higher scores of DLQI (21.43±4.735, 18.88±7.710, and 21.91±5.088, respectively). Spearman correlation coefficient analysis revealed a positive and significant correlation between total DLQI score and total (r_s =0.582) and subgroups of DASS-42 (depression (r_s=0.618), anxiety (r_s =0.508), and stress level (r_s =0.553) scores, respectively) (P<0.001). All these findings suggest that the more DLQI is impaired, the higher the level of depression, anxiety, and stress in scabies patients.

The limitations of our study are the small size of the population and the lack of a control group and pediatric patients.

Conclusion

We conclude that impairment of DLQI is a statistically significant predictive parameter for an increase in depression, anxiety, and stress levels. DASS-42 score is an important variable affecting the DLQI independently from other demographic and clinical characteristics of scabies patients. Scabies is not only associated with impairment in quality of life, but it also may lead to psychosocial problems. All scabies patients should be evaluated and consulted, if needed, for possible problems of psychosocial life, including depression, anxiety, and stress, as well as clinical symptoms and other secondary complications.

References

1. Bilal K, Othman SM, Asaad YA. Quality of life in patients with scabies in Erbil, Iraq. *Zanco J Med Sci*. 2021 Dec; 25(3): 638-48. https://doi.org/10.15218/zjms.2021.030
2. Leung AKC, Lam JM, Leong KF. Scabies: a neglected global disease. *Current Pediatric Reviews*. 2020;16:33-42. doi:10.2174/1573396315666290711411 31.
3. Nair PA, Vora RV, Jıvani N, Gandhi SS. A study of clinical profile and quality of life in patients with scabies at a rural tertiary care centre. *J Clin Diag Res*. 2016 Oct; 10(10):WC01-WC05. doi:10.7860/JCDR/2016/20938.8703
4. Bindushree R, Hosthoata A. A study of clinical profile and quality of life in patients with scabies. *Int J Res Dermatol*. 2021 Jul;7(4):1-5. https://dx.doi.org/10.18203/issn.2455-4529
5. Finlay AY. Quality of Life Indices. *Indian J Dermatol Venereol Leprol*. 2004;70:143-148.
6. Lovibond SH, Lovibond PF. The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behav Res Ther*. 1995;33:335-43.
7. Hon KL, Pong NH, Poon TCW, et al. Quality of life and psychosocial issues are important outcome measures in eczema treatment. *J Dermatol Treat*. 2015 Feb;26(1):83-9. doi:10.3109/09546634.2013.873762
8. Duran S, Atar E. Determination of depression, anxiety and stress (DAS) levels in patients with atopic dermatitis: a case-control study. *Psychology, Health and Medicine*. doi.org/10180/13548506.2019.1710545
9. Kalkur C, Sattur AP, Guttal KS. Role of depression, anxiety and stress in patients with oral lichen planus: a pilot study. *Indian J Dermatol*. 2015 Sep-Oct;60(5):445-9. doi:10.4103/0019-5154.158625
10. Manczyk B, Golda J, Biniak A, et al. Evaluation of depression, anxiety and stress levels in patients with oral lichen planus. *J Oral Sci*. 2019; Vol 61(3):391-7. doi.org/10.2334/josnusd.18-0113
11. Porras-Carrique T, Gonzales-Moles MA, Warnakulasuriya S, Ramos-Garcia P. Depression anxiety, and stress in oral lichen planus: a systematic review and meta-analysis. *Clin Oral Invest*. 2022;26:1391-1408. doi.org/1007/s00784-021-0414-0
12. Nieuwenhujiijsen K, de Boer AGEM, Verbeek JHAM, Blonk RWB, van Dijk FJH. The depression Anxiety Stress Scales (DASS): detecting anxiety disorder and depression in employees absent from work because of mental health problems. *Occup Environ Med*. 2003 Jun; 60 Suppl1 (Suppl 1): i77-82. doi:10.1136/oem.60.supple_1.i77.
13. Karadağ M, Ogutlu H. Prevalance of psychiatric symptoms among refugee adolescents in Turkey: a controlled study. Braz J Psychiatry. 2021 Jan-Feb;43(1):55-60. doi.org/10.1590/1516-4446-2020-0916

14. Al-Gelban KS, Al-Amri HS, Mostafa OA. Prevalence of depression, anxiety and stress as measured by the Depression, Anxiety, and Stress Scale (DASS-42) among secondary school girls in Abha, Saudi Arabia. *SQU Med J*. 2009;9(2):140-7.
15. Elsaie ML, Hasan MS, Zaky MS, Hussein SM, Kadah AS, Omar AM. Implication of COVID-19 on the mental health of Egyptian dermatologists: A cross-sectional study. *J Cosmet Dermatol*. 2021;20:3066-3073. https://doi.org/10.1111/jocd.14390
16. Kaner G, Yurtdaş-Depboylu G, Çalık G, et al. Evaluation of perceived depression, anxiety, stress levels and emotional eating behaviours and their predictors among adults during COVID-19 pandemic. *Public Health Nutrition*. 2022;26(3):674-83. doi:10.1017/S1368980022002579
17. Yıldırım SK, Ogut ND, Erbagcı E, C. Scabies affects quality of life in correlation with depression and anxiety. *Dermatol Pract Concept*. 2023 Apr 1;13(2):e2023144. https://doi.org/10.21203/rs.3.rs-1486167/v1
18. Ali D. Impact of scabies on quality of life and correlation to depression and anxiety. *J Psych*. 2022; 25:509. doi:10.35248/2378-5756.22.509
19. Sun C, Ren Y, Zhang W. Association between skin diseases and anxiety: a logistic analysis and prediction. *Ann Transl Med*. 2023;11(2):115. doi.org/10.21037/atm-22-6511
20. Seetan K, Khamees A, Abusohyon B, et al. Scabies is associated with more anxiety, depression, and impaired quality of life: a cross-sectional comparative study. *J Pharma Neg Results*. 2022; 13(7): 6314-20. doi:10.47750/pnr.2022.13.507.768
21. Öztürkcan S, Ermertcan AT, Eser E, Şahin MT. Cross validation of the Turkish version of dermatology life quality index. *Int J Dermatol*. 2006;45:1300-1307.
22. Bilgel N, Bayram N. Depresyon Anksiyete Stres Ölçeğinin (DASS-42) Türkçeye uyarlanmış şeklinin psikometrik özellikleri. *Nöropsikiyatri Arşivi*. 2010; 47(2): 118-126.
23. Guo F, Yu Q, Liu Z, et al. Evaluation of life quality, anxiety, and depression in patients with skin diseases. *Medicine*. 2020;99: 44(e22983). http://dx.doi.org/10.1097/MD.0000000000022984
24. GBD 2015 Disease and Injury Incidence and Prevalence, Collaborators. Global, regional, and national incidence, prevalence and years lived with disability for 310 diseases and injuries, 1990-2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet*. 2016;388:1545-602. doi:10.1016/S0140-6736(16)31678-6
25. Lugovic-Mihic L, Azdajic MD, Filipovic SK, et al. An increasing scabies incidence in Croatia: a call for coordinated action among dermatologists. *Zdr Varst*. 2020;59(4):264-72. doi:10.2478/sjph-2020-0033
26. Özden MG, Ertürk K, Kartal SP, et al. An extraordinary outbreak of scabies in Turkey. *J Eur Acad Dermatol Venereol*. 2010; 34(12):e818-20. doi:10.1111/JDV16699
27. Ural ZK, Çatak B, Ağaoğlu E. Prevalence of scabies in the Covid-19 pandemic period and determination of risk factors for scabies: a hospital based cross-sectional study in Northeast Turkey. *Acta Parasitol*. 2022 Jun;67(2):802-808. https://doi.org/10.1007/s11686-022-00524-6.
28. Shahbaz H, Shabbir S, Maryam J, Amir S, Humayun A. Quality of life in patients with skin diseases on exposed parts- a study in two teaching hospitals of Lahore. *Proceeding SZPGMI*. 2017;Vol:31(2):103-110.
29. Chowdhry S, Sheoran P, D-Souza P, Yadav MK, Rathore S. Assessment of the quality of life in patients with scabies in an urban tertiary care centre in North India. *Serbian J of Dermatol Venereol*. 2020;12(2):41-6. Doi:10.2478/sjdv-2020-0007
30. Jin-Gang A, Sheng-Xiang X, Sheng-Bin X, et al. Quality of life of patients with scabies. *J Eur Acad Dermatology and Venereol* (Internet). 2010 Oct;24(10):1187-91. Doi:10.1111/j.1468-3083.2010.03618.x.
31. Golpanian RS, Yosipovitch G. *J Am Geriatr Soc*. 2020 Aug;68(8):1680-1682. doi:10.1111/jgs.16627. Epub 2020 Jun 7.
32. Worth C, Heukelbah J, Fengler G, Walter B, Liesenfeld O, Felmeier H. Impaired quality of life in adults and children with scabies from an impoverished community in Brazil. *Int J Dermatol*. 2012;51(3):275-82. doi:10.1111/J 1365-4632.2011.05017.x
33. Lake SJ, Engelman D, Sokana O, et al. Health-related quality of life impact of scabies in Solomon Islands. *Trans R Soc Trop Med Hyg*. 2022;116(2):148-56. doi:10.1093/trstmh/trab096.
34. Collinson S, Timothy J, Zayzay SK, et al. The prevalence of scabies in Monrovia, Liberia: a population-based survey. *PLoS Negl Trop Dis*. 2020 Dec 7;14(12):e008943. doi:10.1371/journal.pntd.0008943.