

Burden of Depression and its Correlates among Patients of Skin Diseases: A Snap-shot from Dermatology Outpatient Clinic in Karachi, Pakistan

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ABSTRACT

Background: Skin problems are widespread health issues that account for a significant portion of the burden of disease worldwide and because of this dermatologists frequently face mood disorders.

Objective: The present study has been planned to determine the prevalence and correlates of depression among skin disease patients presenting in dermatology clinic in Karachi, Pakistan.

Methods: This cross-sectional study was performed at the dermatology clinic at Noor-e-Zia Consultant Clinics from April to August 2022. Depression screening was performed using the Patient Health Questionnaire of 9 items (PHQ-9). The cut-off for positive depression screening was 10 and above.

Results: A total of 385 patients were studied with a median age of 38 (IQR=27-48) years and the majority of them were females (n=256, 66.5%). Patients presented with a median disease duration of one month with a range of 1-24 months. 188 (48.8%) had a PHQ-9 score ≥ 10 . On multivariable logistic regression, lower education, occupation, patients living in a joint family system, current smokers, presence of comorbid, disease severity, and diagnosis of urticaria and folliculitis were associated with higher odds of depression.

Conclusion: The depression burden was higher in dermatology clinic with significantly higher depression among patients of lower education, students, current smokers, patients with comorbid, disease severity, and diagnoses with urticaria and folliculitis.

Keywords: *Mental health, depression, psychological burden, Skin diseases, dermatology.*

INTRODUCTION

An individual's cognition, emotions, feelings, sleep, hunger, weight loss or increase, lack of interest in engaging in daily activities, and suicidal thoughts are all impacted by depression, a mental state or psychiatric mood disorder that causes a chronic feeling of melancholy and loss of interest [1, 2]. Worldwide 14% of individuals experience mental diseases [3]. More than 75% of them are citizens of developing and middle-income nations [4]. Around 280 million individuals worldwide suffer from depression, which affects 3.8% of the population overall, including 5.0% of adults and 5.7% of those over the age of 60 [5]. By the year 2030, depression, HIV/AIDS, and coronary heart disease would all be among the main causes of morbidity [6].

Skin problems are widespread health issues that account for a significant proportion of the burden of disease worldwide. Flushing, itching, desquamation, discomfort, and burning of the epidermis or mucosa are common symptoms of skin illnesses. Simple conditions like scabies and acne can progress to more severe conditions including Stevens-Johnson syndrome, toxic epidermal necrolysis, and purpurafulminans [2, 3]. Skin-related disabilities are serious and impact people of all ages and ethnicities [4]. Skin conditions are more prone than other illnesses to result in psychological issues [7].

In their clinical practice, dermatologists frequently face mood disorders. The difficulties of managing chronic skin illnesses may lead to depression in patients, and as a result, the prevalence of depression among dermatological patients can be as high as 25%–40%, compared to 6%–8% in the general population [8]. For instance, the primary symptom of psoriasis is itching, which harms patients' ability to work, live a normal life, study, and sleep. Acne, hair loss, and atopic dermatitis

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impair a patient's physical appearance as well as their emotional, psychological, and social circumstances. In addition, some skin conditions can lead to food restrictions, infections, and allergies [7]. That's why skin disease patients may experience sadness or anxiety to varying degrees, and in severe situations, they may even exhibit suicidal thoughts [7, 8].

Many surveys have been conducted in different parts of the world evaluating depression in skin disease patients. Recently, a survey published in 2019 from Saudi Arabia reported that the overall prevalence of depression was 15% among patients presenting in dermatology clinics [9]. According to the Psychodermatology Working Party of the British Association of Dermatologists, 17% of dermatology patients also have psychosocial problems in addition to their skin condition [6].

It is a well-known fact that a significant fraction of patients who visit dermatology clinics have underlying psychological disorders [4, 7]. It is important to address the psychopathology that dermatology patients experience since it is a necessary component of their care and, ultimately, rehabilitation. Dermatologists, however, are typically untrained in identifying and managing psychiatric comorbidity that could exist in their patients. The data on depression in skin disease clinics is scanty in Pakistan. The studies conducted in Pakistan ascertaining the depression and/or other psychological disorders in only single dermatological diseases such as urticaria [10], acne vulgaris [11], self-rated skin tone [12], and alopecia [13]. To the best of our knowledge, only a single short report was published in 2010 from Karachi reporting depression prevalence among all of the patients presenting to dermatology outpatient clinics [14]. Therefore, due to the high importance of assessing the mental state of depression patients and the lack of similar literature in Pakistan, the present study has been planned to determine the prevalence and correlates of depression among skin disease patients presenting in a dermatology outpatient clinic in Karachi, Pakistan.

MATERIALS AND METHODS

This cross-sectional study was performed at a dermatology clinic at Noor-e-Zia Consultant Clinics in Karachi, Pakistan from April to August 2022. The study protocol was first approved by the Ethical Committee of Noor-e-Zia Consultant Clinics and then the study was commenced (IRB-D-008-03-22). Study participants were enrolled in the study with their written informed consent. A non-probability consecutive sampling technique was used to enroll study participants. Participants were enrolled meeting the inclusion and exclusion criteria set for the study. Sample size estimation was performed on an online available sample size calculator Open-Epi using an approach of the single population proportion. Following parameters, a 95% confidence interval, 5% precision, and depression prevalence of 34.1% in skin disease patients were put up in a sample size calculator [14]. The calculated sample size was 346.

Inclusion Criteria

1. Patients of any skin diseases of both gender of age at least 18 years presenting to dermatology clinics.
2. Patients willing to participate in the study.
3. Patients with a disease duration of at least one month.

Exclusion Criteria

1. Patients taking an antidepressant and/or diagnosed with any psychiatric/mental illness
2. Patients prescribed dermatological drugs that lead to depression
3. Patients required to undergo skin reconstruction procedures
4. Pregnant and lactating females
5. Cases of trauma and malignancies
6. Patients visiting dermatology clinics for aesthetic purposes

A Tool for Depression Screening

Screening of depression was performed using the Patient Health Questionnaire of 9 items (PHQ-9) which is a self-administered tool for screening depression and evaluating its severity. The Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) depression criteria, which were maintained in DSM-V, are the basis for the nine brief questions that make up PHQ-9. The answers ranged from 0 (not at all) to 3 on a 4-point scale (nearly every day). The nine questions in the PHQ-9 tool assessed interest or pleasure in doing things, feeling of depression, appetite, bad feelings about yourself, trouble in concentration, moving or speaking slowly that other people could notice about it, and thoughts of hurting yourself or suicide ideation. The cut-off value of 10 and above for the PHQ-9 test showed a positive screening test for depression [15]. This tool has been translated and validated in the Urdu language by Hussain and coworkers [16] and we opted for this translated version in our study.

Statistical Analysis

Data was entered in IBM SPSS Statistics for Windows, version 21 (IBM Corp., Armonk, N.Y., USA) to perform statistical analysis of the gathered data. Frequencies and percentages were computed for summarizing categorical variables. Numerical variables were first assessed for the assumption of normality using the Shapiro-Wilk test. All of the numerical variables were non-normally distributed and were expressed as median with inter-quartile range (IQR). Univariate odds ratios were calculated to determine the link of study variables with depression by applying binary logistic regression. Variables of clinical significance with p-value <0.25 in univariate logistic regression were put up in a final multivariable regression model. Statistical significance was defined based on a p-value ≤ 0.05 on a final regression model.

Table 1: Descriptive statistics for study participants.

Participants' features	Groups	Count	Percentage
Age	18-30 years	136	35.3
	31-49 years	166	43.1
	50 years and above	83	21.6
Residence	Urban	354	91.9
	Rural	31	8.1
Education	Illiterate	44	11.4
	up to 5th grade	30	7.8
	6th to 8th grade	0	0.0
	9th to 10th grade	128	33.2
	12th grade to undergraduate	104	27.0
	Graduate and above	79	20.5
Occupation	Labor	80	20.8
	Office job	48	12.5
	Housewife	143	37.1
	Student	78	20.3
	Business	10	2.6
	Outdoor jobs	7	1.8
	Teacher	19	4.9
	Marital status	Married	283
	Unmarried	102	26.5
Family system	Joint	223	57.9
	Independent	162	42.1
Perform exercise at least thrice a week	Yes	167	43.4
	No	218	56.6
Smoking status	Never	295	76.6
	Former	49	12.7
	Current	41	10.6

RESULTS

Demographic Features of Study Participants

A total of 385 patients were enrolled in the study with a median age of 38 (IQR=27-48) years and the majority of them were females (n=256, 66.5%). Table 1 displays the socio-demographic characteristics of study participants.

Table 2: Comparison of demographic and clinical features among depressed and non-depressed patients and their association with depression on univariate analysis.

Participants' features	Groups	Depressed n(%)	Non-depressed n(%)	OR (95% CI)	p-value
Demographic features					
Age (in years)#	-	35 (21-48)	39 (29-48)	0.98 (0.97-0.99)	*0.022
Gender	Male	72(56)	57(44)	0.75 (0.49-1.15)	0.196
	Female	125(49)	131(51)		
Residence	Urban	174(49)	180(51)	2.97 (1.29-6.82)	*0.010
	Rural	23(74)	8(26)		
Education	Illiterate	28(64)	16(36)	1.04 (0.48-2.24)	0.919
	Primary till under graduation	26(87)	4(13)	2.22 (1.32-3.74)	*0.030
	Graduation and above	51(65)	28(35)	Ref	
Occupation	Labor	36(45)	44(55)	0.48 (0.25-0.93)	*0.030
	Office job	32(67)	16(33)	0.20 (0.09-0.43)	**<0.001
	Teacher	91(64)	52(36)	0.22 (0.12-0.41)	**<0.001
	Student	7(37)	12(63)	0.67 (0.24 - 1.93)	0.463
	Business	5(50)	5(50)	0.39 (0.10-1.49)	0.170
	Outdoor jobs	4(57)	3(43)	0.30 (0.06-1.42)	0.129
	Student	22(28)	56(72)	Ref	

Clinical Features of Study Participants

Patients presented with a median disease duration of one month with a range of 1-24 months. Patients presented with moderate (n=111, 28.8%) and severe diseases (n=274, 71.2%). Nearly one-third (n=132, 34.3%) had comorbidity. 82 (21.3%) had comorbidity of diabetes and 62 (16.1%) had comorbidity of hypertension. Fig. (1) presents the frequency distribution of dermatological diagnosis.

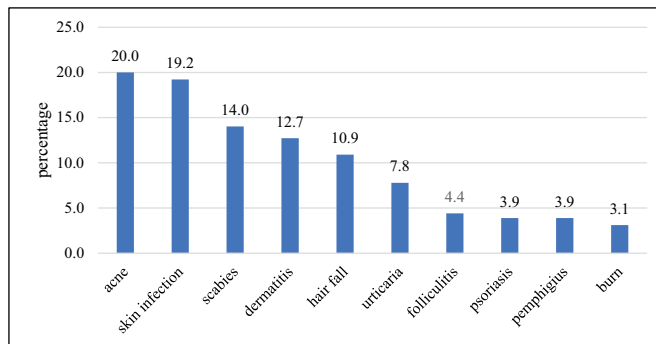


Fig (1): Frequency of different skin diseases presented in this study.

Depression Prevalence and Univariate Association of Patients' Features with Depression

Out of 385 patients, 188 (48.8%) had a PHQ-9 score ≥10. Table 2 shows the univariate association of study variables with depression. In univariate analysis, increasing age was associated with a reduced risk of depression (p=0.022). The odds of depression were more than two-fold among urban residents than among patients belonging to rural residences (p=0.010). In contrast to patients who were graduates or postgraduates, the likelihood of depression was significantly higher in patients having an education level of primary to intermediate (p=0.003). As compared to students, the risk of depression was significantly lower in patients doing office jobs (p<0.001) and among housewives (p<0.001). Unmarried patients were two-

Participants' features	Groups	Depressed n(%)	Non-depressed n(%)	OR (95% CI)	p-value
Marital status	Married	164(58)	119(42)	Ref	
	Unmarried	33(32)	69(68)	2.88 (1.78-4.64)	**<0.001
Family system	Joint	133(60)	90(40)	0.44 (0.29-0.66)	**<0.001
	Independent	64(40)	98(60)	Ref	
Perform exercise at least thrice a week	Yes	122(56)	96(44)	0.64 (0.43-0.96)	*0.032
	No	75(45)	92(55)	Ref	
Smoking status	Never	295	76.6	Ref	
	Former	27(55)	22(45)	0.90 (0.49-1.65)	0.740
	Current	15(37)	26(63)	1.92 (0.98-3.78)	0.059
Comorbid	Yes	61(46)	71(54)	1.35 (0.88-2.06)	0.160
	No	136(54)	117(46)	Ref	
Diabetes	Yes	37(45)	45(55)	1.36 (0.83-2.22)	0.218
	No	160(53)	143(47)	Ref	
Hypertension	Yes	28(45)	34(55)	1.33 (0.77-2.30)	0.303
	No	169(52)	154(48)	Ref	
Disease severity	Moderate	76(68)	35(32)	0.36 (0.30-0.58)	**<0.001
	Severe	121(44)	153(56)	Ref	
Diagnosis	Acne	39(51)	38(49)	1.03 (0.62-1.69)	0.919
	Urticaria	5(17)	25(83)	5.89 (2.21-15.73)	**<0.001
	Hair fall	28(67)	14(33)	2.05 (1.05-4.04)	*0.036
	Skin infection	34(46)	40(54)	1.30 (0.78-2.15)	0.318
	Burn	8(67)	4(33)	1.95 (0.58-6.58)	0.283
	Folliculitis	6(35)	11(65)	1.98 (0.72-5.46)	0.188
	Dermatitis	24(49)	25(51)	1.11 (0.61-2.01)	0.743
	Psoriasis	12(80)	3(20)	4 (1.11-14.41)	*0.034
	Pemphigus	12(80)	3(20)	4 (1.11-14.41)	*0.034
Scabies	29(54)	25(46)	1.13 (0.63-2)	0.688	

CI: Confidence interval, OR: Odds ratio, Ref: Reference category

#Age is presented as median with an inter-quartile range

*Significant at p<0.05, **Significant at p<0.01

fold more likely to suffer from depression than married patients (p<0.001). The odds of depression were lower in patients living in a joint family system (p<0.001). Patients performing exercise at least thrice a week were less likely to be depressed than patients not performing exercise (p=0.032). The depression likelihood was significantly lower among patients having a disease of moderate severity than among patients with severe disease (p<0.001). Patients with a diagnosis of urticaria (p<0.001), hair fall (p=0.036), psoriasis (p=0.034), and pemphigus (p=0.034) had higher odds of depression than patients having other diagnoses.

Multivariable Association of Patients' Features with Depression

Table 3 displays the association of study variables on the multivariable regression model. After adjusting the effects of other covariates, low education at the primary to intermediate level was associated with a nearly two-fold increase in depression risk as compared to patients who had an education of graduation or above. The adjusted odds of depression were significantly lower in patients doing office jobs and among housewives as compared to patients who were students. Patients living in the joint family system were less likely to be depressed

Table 3: Association of patients' features on the multivariable regression model.

Participants' features	Groups	aOR	95% CI	p-value
Age (in years)	-	0.99	0.96-1.02	0.804
Gender	Male	0.41	0.11-1.51	0.181
	Female		Ref	
Residence	Urban	1.08	0.27-4.25	0.908
	Rural		Ref	
Education	Illiterate	4.50	0.98-20.74	0.053
	Primary to intermediate	4.63	1.71-12.52	**0.003
	Graduate and above		Ref	
Occupation	Labor	0.37	0.07-1.84	0.226
	Office job	0.23	0.07-0.74	*0.013
	Teacher	0.18	0.04-0.75	*0.19

Participants' features	Groups	aOR	95% CI	p-value
	Student	1.73	0.29-10.18	0.543
	Business	0.32	0.04-3.01	0.324
	Outdoor jobs	0.31	0.03-3.37	0.333
	Student		Ref	
Marital status	Married		Ref	
	Unmarried	2.09	0.66-6.67	0.210
Family system	Joint	0.48	0.27-0.85	*0.011
	Nuclear		Ref	
Perform exercise at least thrice a week	Yes	0.68	0.37-1.22	0.200
	No		Ref	
Smoking status	Never		Ref	
	Former	1.35	0.38-4.78	0.638
	Current	5.44	1.60-18.51	**0.007
Comorbid	Yes	1.94	1.11-3.39	*0.019
	No		Ref	
Disease severity	Moderate	0.38	0.32-0.62	**<0.001
	Severe		Ref	
Diagnosis	Urticaria	5.43	1.84-15.98	*0.002
	Hair fall	1.45	0.63-3.32	0.374
	Folliculitis	5.09	1.27-20.36	*0.021
	Psoriasis	3.52	0.78-15.85	0.101
	Pemphigus	0.97	0.21-4.62	0.975

CI: Confidence interval, aOR: Adjusted odds ratio, Ref: Reference category

*Significant at $p < 0.05$, **Significant at $p < 0.01$

than patients living in a nuclear family system. The risk of depression was higher in patients having comorbidity than those who had no comorbid disease. Smoking status was still found to be associated with depression even after adjustment of covariates effects with significantly higher odds of depression among current smokers than patients who never smoked. Urticaria and folliculitis were associated with an increased risk of depression as compared to other diagnoses when the effects of covariates were adjusted.

DISCUSSION

Skin diseases are one of the most common presentations clinicians encountered in their daily practice. Yet it poses a significant public health burden both in developing and developed countries. They are accounted for approximately 10.0% of a general practitioner's workload and 6.0% of outpatient referrals [17, 18]. Skin disease is identified as posing a substantial influence on the quality of life, efficiency, and mental health. Additionally, psychological problems are more common in dermatology patients than in other medical patients and in dermatology outpatients than in the general population [19]. The criticality of this fact provided the basis of this study and thus we aimed to evaluate the burden of depression in patients presenting with skin diseases in our settings.

In this study, the median age of patients visiting a dermatology clinic is 38 years. Another Pakistani study analyzing the pattern of skin diseases in outpatient dermatology clinics also reported that the mean age of patients was 38 ± 11.5 years [20]. An average age of

37.34 ± 15.71 years was also reported from a similar Saudi study [9]. Another Saudi study investigating mood disorders among dermatological patients reported mean age of 37.34 ± 15.71 years [21]. In contrast to our findings, another Pakistani study performed in Karachi in a tertiary care hospital reported that the mean age of skin disease patients was 28.04 ± 15.67 years [22]. However, this study did not present data from daily outpatient clinics but analyzed patients presenting in a one-day free screening camp, which may cause changes in patient presentation from daily routine. It is consistently reported in the literature dermatological diseases affect patients of any age. But a consistent finding of an average age of 38 years could be inferred in a way, particularly in Pakistani surroundings that the majority of the patients visiting dermatology clinics are in the middle age group who are reproductive men power and economically more stable to afford the expensive and long-run treatment of dermatological disease. However, to verify the average age of skin disease patients in Pakistan, a larger multi-center study should be conducted to analyze the true burden of dermatological diseases among different age groups.

The present study analyzed that there was female predominance making nearly two-thirds of the presentation of the total studied patients (66.5%). This finding is not surprising as the previously existing literature from Pakistan as well as countries other than Pakistan consistently reported that the proportion of female patients is higher in dermatology outpatient clinics than in male patients [9, 20, 22]. The reason is understandable as females are more concerned about

any skin-related disease which bring a negative impact on their physical appearance.

In the present study, the most frequent reason for visiting clinics was acne (20%) whereas other top visiting reasons were skin infection (19.2%), scabies (14%), dermatitis (12.7%), hair fall (10.9%) and less frequent reasons were urticaria (7.8%), folliculitis (4.4%), psoriasis (3.9%), pemphigus (3.9%) and burns (3.1%). Contrary to our findings, other Pakistani studies did not find acne as the top reason for visiting dermatology outpatient clinics [20, 22, 23]. The most likely reason for this conflicting finding is that the current study was conducted in a clinic situated in a local area of Karachi which is also at a short distance from nearby underprivileged areas. Thus, patients with minor problems like acne or hair fall in nearby areas might have preferred to visit this small clinic which is more affordable and easily accessible to them instead of visiting a tertiary care hospital and bearing the high cost and long waiting queues. Our finding of other top reasons including skin infection and scabies was in agreement with other Pakistani studies [20, 22, 23]. Aman *et al.* reported skin infection as the second most presenting complaint in their settings [23]. Suleri and coworkers from Sialkot also reported skin infection as the most frequent reason for visiting derma-clinics (42%) [20]. Siddiqui *et al.* reported in their study that non-infectious skin diseases were more prevalent (61%) in a dermatology clinic. Since this study presented the data of one-day free camp consultation so findings could be different [22]. The most frequent skin disease reported in a Mexican study was parasitic, viral, and fungal infection (34.5%). Dermatitis and eczema (24.6%) were the next top frequent skin diseases whereas scabies and acne were seen among 8.7% and 7.4% of patients respectively. Less frequently seen complaints were urticaria (1.5%) and bacterial infections (1.2%) [24]. A Brazilian study reported acne (8%) as the top dermatological consultation cause followed by skin aging (7.7%), non-melanoma skin cancer (6.6%), Actinic cheilitis (4.7%), superficial mycosis (4.5%), psoriasis (4.4%) and melasma (3.7%) [25]. The difference in skin diseases pattern among different countries is obvious because of different ecological factors, genetics, hygienic standards, and social customs [26, 27].

This study found depression in nearly half of the total patients presenting in outpatient clinics (48.8%). To the best of our findings, the last study that was conducted in Pakistan ascertaining the depression burden in adult dermatology clinics was conducted in 2010 reporting a depression prevalence of 34.1% which is a close finding to our study [14]. A higher burden of depression in adult dermatology clinics has been reported in Vietnam (71.8%) [28], Iran (70%) [29], and India (57.3%) [30], whereas a lower burden of depression was reported from United States (15.74%) [31], Saudi Arabia (15.8%) [9]. This is noticeable that the depression burden is higher in middle-income countries whereas higher-

income countries showed lower depression rates in their dermatology patients. This could be taken as countries with middle income have weaker healthcare systems with limited access to quality healthcare providers whereas high-income countries cover the healthcare burden through insurance policies. However, this explanation does not fit when a Nigerian study reported a lower prevalence of 15.6% [32] and a UK-based study reported that 42.9% exceeded the clinical cut-off for depression [33]. It could simply understand that variance in depression rates could be due to different social, cultural, and environmental triggers including the process of healthcare delivery, tools used for depression detection, and the number of patients studied.

The existing literature consistently reports that older persons have a higher prevalence of depressive symptoms. With increased age, elderly persons' physical function declines, and vulnerability to chronic diseases and negative emotions increases, leading to depressive symptoms. However, when the discussion comes to the domain of dermatology, the factors of age could have no impact as the consequences of skin diseases are equally important and troublesome for an individual of any age group. In the univariate model, increasing age was found to be associated with a lower risk of depression but it was no longer significant when the model was adjusted with other clinical and statistical covariates. This finding of a non-significant association of age with depression among skin disease patients is in agreement with a study from India [30], and Nigeria [32]. However, another similar Chinese study established a negative association of age with depression in skin disease patients [7]. The difference in sample size and overall depression rate could cause variance in findings.

In this study, the prevalence rate of depression among females (51%) is higher than males (44%) but not different with a larger magnitude and there was no association between gender and depression. The finding is consistent with other similar studies [9]. Some other studies reported gender association with depression [7, 30].

The current study found a significant association between depression and education with significantly higher depression odds among less educated people than educated patients which is a self-explanatory fact. Many other researchers reported levels of education as a significant trigger of depression in skin disease patients [7, 28, 30].

Another demographic factor that we found significant is the occupation with lesser risk among patients of different occupations than students. The higher risk in students is plausible because of bullying at their college/university and non-acceptance by their peers because of fear of catching diseases and making the patients uncomfortable due to deformed body images, particularly in Pakistani culture. An Indian study reported

higher depression odds among students as compared to a businessman [30]. However, a Nigerian study demonstrated a lower likelihood of depression among students (4.1%) than patients who were doing clerical and office jobs (14.6%) [32].

Many studies reported alcohol consumption was linked with higher depression in derma patients [28, 34]. In our study, none of the patients reported addiction to alcohol. However, some of the patients were smokers and former smokers and the depression risk was significantly higher in current smokers than in those who never smoked.

This is interesting to point out that none of the patients who visited our clinic had a mild degree of disease. All of the patients presented with moderate to severe disease. This is the foremost problem in healthcare-seeking behavior in the Pakistani population that they first attempt to cure the problems with home remedies with the suggestion of their family or friends for any of the health problems instead of seeking help from a medical professional and hence present with exacerbating sickness only when the disease is uncontrollable for them [35, 36].

It is not a surprising finding of our study that having the comorbid was associated with higher odds of depression and impaired emotions [37]. This is to be noticed that the cohort of patients studied had comorbid of either hypertension or diabetes. The presence of any of these two comorbid adversely affects the disease course like in the case of diabetes the curative cycle is at a slower rate than in patients without diabetes whereas in the case of hypertension, it may be difficult for patients to adhere to the treatment regimen as psychologically patient may have a feeling of experiencing hypertension as a side effect of medication prescribed for treatment of skin problems. This explanation is particularly valid in Pakistani settings based on our daily routine practice in outpatient clinics.

In this study, it was observed that in univariate analysis, diagnosis of urticaria, hair fall, psoriasis, and pemphigus were significantly associated with a higher likelihood of depression. However, in the multivariable model after adjusting the covariates effects, urticaria and folliculitis were found to be associated with higher odds of depression. The higher likelihood of urticaria, hair fall psoriasis, and pemphigus is reported in different studies. Conversely conflicting with the available literature, it is interesting to see that psoriasis was not associated with greater depression odds on the final multivariable model [38, 39]. Since this study enrolled 385 patients consecutively visiting our clinic and the proportion of psoriasis patients was only 4% approximately due to which this association was distorted in the final regression model.

This study found a higher depression burden in our clinic which emphasizes the need for a proper referral system in Pakistani settings for psychiatric evaluation and evaluation of the fact that depression is causing physiological changes and leading to skin diseases or skin diseases causing depression. The present study is one of the rare studies from Pakistan but it suffers from some serious limitations due to which it is suggested not to generalize the results of this study to the entire Pakistani skin diseases population. First, this study shared an experience of a clinic in Karachi enrolling only patients presenting with a single dermatological complaint. The sample size was not equally distributed for all of the diseases as the sample size was achieved with consecutive enrolment of the patients due to which depression among different diagnoses might not be the true picture of our population. To overcome all these limitations, we suggest replicating this study in multi-center for studying a larger sample and verifying the findings of the current study.

CONCLUSION

The depression burden is higher in our dermatology clinic with significantly higher depression among patients of lower education, students, current smokers, patients with comorbid, severe diseases, and diagnoses with urticaria and folliculitis.

ETHICS APPROVAL

The study was conducted according to the guidelines of the Declaration of Helsinki, and an approval letter was issued by the Ethics Committee of Noor-e-Zia Consultant Clinics bearing letter number # IRB-D-008-03-22.

CONSENT FOR PUBLICATION

Written informed consent was taken from study participants before their enrolment into the study.

AVAILABILITY OF DATA

The data set may be acquired from the corresponding author upon a reasonable request.

FUNDING

None.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

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None.

AUTHORS' CONTRIBUTIONS

SZ and SK: study conceptualization, DH and MIA: methodology and proposal writing, FS, FZ & SZ: data collection, data analysis, and interpretation, SR and REZ: Original draft preparation, AAK, BK, and SK: writing review and editing. All authors read and approved the final draft of the manuscript for publication.

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