

## ASSESSMENT OF DEPRESSION IN RELATION TO PRURITIS AND ITS SEVERITY

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## ABSTRACT

**Background:** Pruritis and depression are both very common symptoms in dermatology patients affecting the lives of many patients. Not many studies have studied their prevalence and possible association.

**Objective:** This study will evaluate the prevalence of pruritis and depression and their severities in dermatology patients and study their possible association.

**Methods:** This is a questionnaire based cross sectional study that was held at the Jordanian royal medical services – King Hussein Medical Center, from Nov 2023 to Feb 2024. Our target population was dermatology clinic patients of which we had a total of 134 participants. Forms were distributed to dermatology patients and consent taken for participation. The forms did not include any patient identifiers other than the age and gender. We conducted a survey including questionnaires regarding age, gender, presence of pruritis and its severity, and presence of depression and its severity using the 12-item pruritis severity scale for pruritis severity and PHQ-9 score for depression, respectively.

**Results:** Depression was present in 67% of dermatology clinic patients as assessed by the PHQ-9. Among those 45% had mild depression, 34% had moderate depression, 14% had moderately severe depression and 5.5% had severe depression.

51.4% of dermatology patients suffered from pruritis as assessed by the 12-PSS; among those 14.4% had mild pruritis, 37.6% had moderate pruritis, and 47.83% had severe pruritis.

Patients with pruritis had a significantly higher age compared to those without pruritis (median: 37.0 vs. 26.0, p-value=0.008). When comparing pruritis severity, patients with severe pruritis (n=33) showed a significantly higher depression score compared to those with mild and moderate pruritis (median: 10.0 vs. 5.0 vs. 5.0, p-value=0.037). In addition, 94% of patients with severe pruritis had depression (p-value<0.001). There was a significant relation between the presence of depression and pruritis severity  $X^2 (2, N=69) = 16.149$ , p-value = 0.0003.

**Conclusion:** Patients with severe pruritis were more likely to have depression. But generally, there was no significant relationship between depression and the presence of pruritis.

**Key words:** Pruritis, Depression, 12 item pruritis severity scale, PHQ-9 score

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## INTRODUCTION

Both pruritis and depression are common disorders affecting the general population. The prevalence of acute itch in the general

population is 8.4% and for chronic itch it is 13.5%. As for depression; ; an estimated 3.8% of the population experience depression at

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some point. Pruritis is an uncomfortable sensation that causes itchiness and is a very common symptom in many skin diseases including atopic dermatitis, lichen planus, psoriasis, urticaria and others. There are various methods to assess the severity of pruritis including the 12 item Pruritis Severity Scale (12-PSS), the 5-point Verbal Rating Scale (VRS), Numeric Rating Scale (NRS), The 4 Item Itch Questionnaire (4IIQ), and others.

Depression is a mood disorder that causes a persistent feeling of sadness and loss of interest. There are multiple scores available for the assessment of depression and its severity. Including the Patient Health Questionnaire-9 (PHQ-9), Beck Depression Inventory (BDI), Hamilton Depression Rating Scale (HDRS), and others.

The prevalence of both pruritis and depression is expected to be higher in dermatology patients as compared to the general population. As many skin diseases present with pruritis. And having chronic skin disorders have a big impact on the mental well being of patients.

## **METHODS**

### ***Patient population***

This study included responses from dermatology clinic patients within the King Hussein Medical Center in Amman, Jordan over a 3 month period between November of 2023 and February of 2024. There was a total of 134 responses registered (89 Females and 45 Males). With an age range of 15-76 (Mean age of 34 years).

### ***Data collection***

Consenting Dermatology clinic patients were asked to complete a questionnaire containing information about age, gender,

presence of pruritis and its severity, and presence of depression and its severity.

This study was approved by the institutional review board at the King Hussein Medical Center and was performed in accordance with the relevant regulations.

### ***Assessing presence and severity of pruritis***

All patients were asked to answer whether pruritis was present or not. In patients with pruritis they were then asked to complete the 12-Item Pruritis Severity Scale (12-PSS) which contains 12 items to assess the severity of pruritis, with scores ranging from 3 to 22. According to the 12-PSS score, pruritis can be classified into 3 severities (Mild, Moderate, Severe).

A score range of (3-6) constituted mild pruritis, A score range of (7-11) constituted Moderate pruritis, and a score range of (12-22) constituted severe pruritis. The figure below shows the 12-Item Pruritis Severity Scale. Fig (1)

### ***Assessing presence and severity of pruritis***

All patients were asked to complete the Patient Health Questionnaire-9 (PHQ-9) which is a 9 item score used to assess for the presence of depression and its severity asking questions about symptoms over the last 2 weeks. It has a score range of 0-27 and according to the PHQ-9 score there can be 5 categories of patients.

Patients with a score range of (0-4) are considered to have "No Depression", Those with a score range of (5-9) are considered to have "Mild Depression", Those with a score range of (10-14) are considered to have "Moderate

Depression”. Those with a score range between (15-19) are considered to have “Moderately Severe Depression”,

And those with score ranges between (20-27) are considered to have “Severe Depression”.

Question		Possible answers	Scoring
(1)	How often did you feel pruritus within the last 3 days?	(i) All time	3 points
		(ii) All morning/afternoon/evening/night long itch episodes	2 points
		(iii) Occasionally, short itch episodes	1 point
(2)	Did pruritus hinder your ability to do simply things, like watching TV, hearing music, etc.?	(i) Yes	1 point
		(ii) No	0 points
(3)	Did you feel irritated or nervous because of your itching?	(i) Yes	1 point
		(ii) No	0 points
(4)	Did your pruritus cause you depressed?	(i) Yes	1 point
		(ii) No	0 points
(5)	Did your pruritus impede your work or learning abilities?	(i) Yes	1 point
		(ii) No	0 points
(6)	Did you scratch your skin because of itching?	(i) Yes	1 point
		(ii) No	0 points
(7)	Did scratching bring you relief?	(i) Yes	0 points
		(ii) No	1 point
(8)	Were you able to refrain from scratching?	(i) Yes	0 points
		(ii) No	1 point
(9)	Did you wake up during last night because of pruritus?	(i) No	0 points
		(ii) Yes, 1-2 times	1 point
		(iii) Yes, 3-4 times	2 points
		(iv) Yes, 5 and more times	3 points
(10)	Could you assess the severity of your pruritus within last 3 days?	(i) Very mild	1 point
		(ii) Mild	2 points
		(iii) Moderate	3 points
		(iv) Severe	4 points
		(v) Very severe	5 points
(11)	Could you indicate pruritus location?	(i) Single locations of pruritus	1 point
		(ii) Large body areas	2 points
		(iii) Generalized pruritus	3 points
(12)	Are excoriations or other scratch lesions present?	(i) Yes	1 point
		(ii) No	0 points

**Figure 1.** 12 Item Pruritis Severity Scale for assessing the severity of pruritis.

Over the last 2 weeks, how often have you been bothered by any of the following problems?	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself – or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

**Figure 2.** Patient Health Questionnaire –9 (PHQ-9) for assessing presence and severity of depression

## RESULTS

Statistical analysis was performed using SPSS. Groups were compared with t-test or with ANOVA or chi square test. We considered a p-value less than <0.05 to be significant.

### **Baseline characteristics**

A total of 134 patients were included in the study, with a median age of 32.0 (15-76). The majority of patients were females (n=89, 66%), while 45 (34%) were males. Pruritis was seen in 69 (51%) of samples, and 65 (49%) did not have pruritis.

The median pruritis score was 11.0 (3.0, 21.0), with 10 (14.5%) of patients having mild pruritis, 26 (37.7%) having moderate pruritis, and 33 (47.8%) having severe pruritis. Median depression score was 7.0 (0.0, 24.0), with 90 (67%) of patients experiencing depression, and 44 (33%) with no depression. Severity of depression was mild in 41 (31%) of patients, moderate in 31 (23%) of patients, moderately severe in 13 (9.7%) of patients, and severe in 5 (3.7%) of patients. **Table 1** shows demographic and clinical characteristics of included sample.

**Table 1:** Demographic and clinical characteristics of included sample.

Characteristic	N= 134 <sup>1</sup>
<b>Age (Years)</b>	32(15.76)
<b>Gender</b>	
Female	89(66%)
Male	45 (34%)
<b>Pruritis</b>	69 (51%)
<b>Depression score</b>	7.0 (0.0,24.0)
<b>Presence of depression</b>	
Depression	90 (67%)
No depression	44 (33%)
<b>Depression severity</b>	
No depression	44 (33%)
Mild	41 (31%)
Moderate	31 (23%)
Moderately severe	13 (9.7%)
Severe	5 (3.7%)
<b>Pruritis Score*</b>	
<b>Pruritis severity*</b>	
Mild	10 (14.5%)
Moderate	26 (37.7%)
Severe	33 (47.8%)

<sup>1</sup>Median (Minimum, Maximum); n (%)

\*Only in patients with pruritis

### **Association between pruritus and depression**

When comparing patients with and without pruritis, there was a significant

difference in age showing that patients with pruritis had a significantly higher age compared to those without pruritis

(median: 37.0 vs. 26.0, p-value=0.008) as shown in **Table 2**. In addition, 40 (58%) of patients with pruritis were females (p-value=0.033). There was no significant difference between the presence of pruritis and depression. We have found no statistically significant difference in depression scores between patients with pruritis and others without pruritis (median depression score: 7.0 vs 7.0, p = 0.2).

#### ***Association between pruritis severity and depression***

When comparing pruritis severity, patients with severe pruritis (n=33) showed a significantly higher depression score compared to those with mild and moderate

pruritis (median: 10.0 vs. 5.0 vs. 5.0, p-value=0.037) as shown in Figure 1. In addition, 94% of patients with severe pruritis had depression (p-value<0.001), of which 14 (42%) had mild depression, 11 (33%) had moderate depression, 4 (12%) had moderately severe depression, and 2 (6.2%) had severe depression (p-value=0.002), while 13 (50%) of patients with moderate pruritis, and 5 (50%) of patients with mild pruritis had depression as shown in Table 3. There was a significant relation between the presence of depression and pruritis severity on chi-square test  $X^2 (2, N=69) = 16.149$ , p-value = 0.0003. Patients with severe pruritis were more likely to have depression.

**Table 2:** Comparison in demographic and depression score between pruritis groups.

Characteristic	Pruritis (N= 69 <sup>1</sup> )	No Pruritis (N = 65 <sup>1</sup> )	P-value <sup>2</sup>
<b>Age (Years)</b>	37 (15, 76)	26 (15, 62)	<b>0.008</b>
<b>Gender</b>			<b>0.033</b>
Female	40 (58%)	49 (75%)	
Male	29 (42%)	16 (25%)	
<b>Depression score</b>	7.0 (0.0,24.0)	7.0 (0.0, 18.0)	0.2
<b>Presence of depression</b>			0.3
Depression	49 (71%)	41 (63%)	
No depression	20 (29%)	24 (37%)	
<b>Depression severity</b>			0.2
No depression	20 (29%)	24 (37%)	
Mild	20 (29%)	21 (32%)	
Moderate	16 (23%)	15 (23%)	
Moderately severe	8 (12%)	5 (7.7%)	
Severe	5 (7.2%)	0 (0%)	

<sup>1</sup>Median (Minimum, Maximum); n (%)

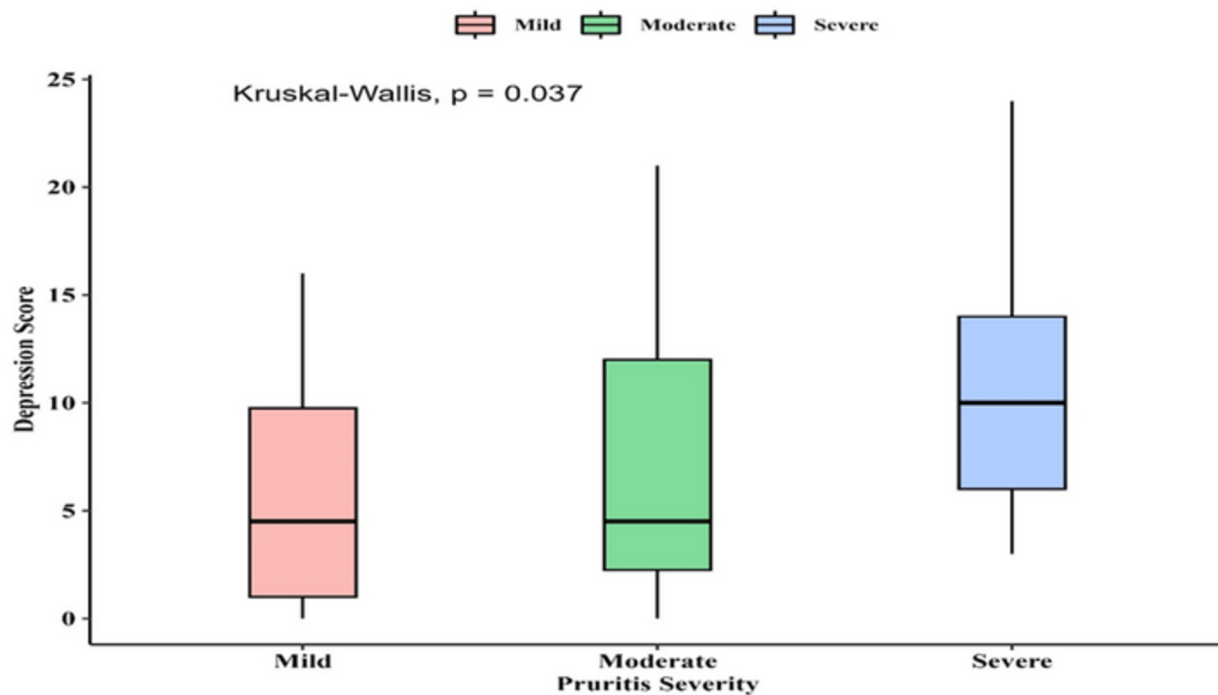
<sup>2</sup>Wilcoxon rank sum test; Pearson's Chi-squared test; Fisher's exact test

**Table 3: Comparison between depression and pruritis severity.**

Characteristic	Mild N= 10 <sup>1</sup>	Moderate N= 26 <sup>1</sup>	Severe N = 33 <sup>1</sup>	P-value <sup>2</sup>
Age (Years)	31 (15, 64)	41 (15, 65)	36 (16,76)	0.9
Gender				0.9
Female	6 (60%)	16 (62%)	18 (55%)	
Male	4 (40%)	10 (38%)	15 (45%)	
Depression score	5 (0,16)	5 (0, 21)	10 (3,24)	<b>0.037</b>
Presence of depression				<b>&lt;0.001</b>
Depression	5 (50%)	13 (50%)	31 (94%)	
No depression	5 (50%)	13 (50%)	2 (6.1%)	
Depression severity				<b>0.002</b>
No depression	5 (50%)	13 (50%)	2 (6.1%)	
Mild	2 (20%)	4 (15%)	14 (42%)	
Moderate	1 (10%)	4 (15%)	11 (33%)	
Moderately severe	2 (20%)	2 (7.7%)	4 (12%)	
Severe	0 (0%)	3 (12%)	2 (6.1%)	

<sup>1</sup>Median (Minimum, Maximum); n (%)

<sup>22</sup>Kruskal-Wallis rank sum test; Fisher's exact test



**Figure 3.** Boxplots showing comparison between pruritis severity and depression score, with severe pruritis showing significantly higher depression score

## DISCUSSION

Pruritis is an uncomfortable sensation that causes itchiness, it is a common symptom in many dermatological diseases and even in the general public with the prevalence of acute pruritis (<6 weeks) among the general public reported at 8.4% and chronic pruritis (>6 weeks) at 13.5% [1]. A large survey in dermatological outpatient clinics was conducted in 13 European countries assessing the distribution of skin conditions among dermatological patients. In this sample of 4,994 adult participants, the prevalence of itch among dermatological patients was 54.4%, and among controls it was 8% [2]. This is close to the results we got in our study among dermatology patients in Jordan. Where 51.4% of our patients suffered from pruritis. Interestingly while pruritis is generally more common in females, in our study pruritis was more common in males with an OR of 2.2 (95% CI 1.05-4.6). The majority of patients with pruritis had Severe pruritis with 47.82% of patients having severe pruritis according to 12-PSS. The majority of patients had severe pruritis (47.82% according to 12-PSS). This reflects the effect of severe disease on the mental health and the psychological aspect of patients. However, these results need to be interpreted carefully, as our data comes from a single-center tertiary hospital. As for depression, the results we had with the PHQ-9 screening were more than that reported in other studies with 67.2% of our dermatology patients suffering from depression according to PHQ-9 screening. Studies on depression prevalence estimated it to be 3.8% among the general public [3]. A meta-analysis of 83 cross-sectional studies assessing the presence of depression among outpatient

clinics of different specialties showed a prevalence of 27% of depression among outpatient clinic patients. The highest depression/depressive symptom prevalence estimates occurred in studies of outpatients from otolaryngology clinics (53.0%), followed by dermatology clinics (39.0%) and neurology clinics (35.0%) [4]. The higher prevalence of depression among dermatology clinic patients in Jordan as compared to other countries remains unexplained, and it could be due to differences in screening tests used, differences in standards of life, and possible higher prevalence of depression among the Jordanian public [5]. Further data collection is needed to reinforce this finding and to find possible explanations.

While there was no link in our study between the presence of pruritis as reported by patients with the presence of depression according to PHQ-9 screening, our limited sample size might have played a role in that finding. Patients with more severe pruritis were more likely to have moderately severe and severe depression, and this might explain the burden of severe pruritis on dermatology patients and possibly contributing to the development of depression in these patients. Additionally, both pruritis and depression are disorders of the nervous system. With many cases of pruritis being psychogenic and presenting with psychiatric symptoms, there might be a molecular explanation of their possible association [6]. It has been shown that the persistence of chronic stress in atopic dermatitis, with pruritus as a significant contributing factor, can perpetuate neuroendocrine dysfunction triggered by allergic inflammation. This, in turn, exacerbates the condition, creating a detrimental cycle of disease aggravation [7].



The cycle of itching and scratching eventually leads to a vicious circle, which can be interpreted as a loss of control and feelings of helplessness. Often, this is accompanied by a sense of despair and guilt [8].

Many studies have reported on a possible association between pruritus and depression, anxiety, insomnia, and quality of life [9]. But this is the first study done using the 12-PSS score to assess severity of pruritus and linking it to PHQ-9 screening for depression. It's also the first study to report on pruritis and depression among Jordanian dermatology patients. Such high rates of pruritis and depression among dermatology patients' population is very alarming, and it raises the importance of tackling these problems as dermatologists. Screening for psychological impacts including depression among all dermatology patients is of vital importance, as a lot of the time it can go unnoticed [10]. And so is screening for pruritis, while actively trying to relieve the sensation of itch, especially in those with severe pruritis who are more likely to have severe depression [11]. A previous study conducted on dermatology inpatients with itch as the primary symptom unveiled that among 109 patients, 70% were diagnosed with up to 6 psychiatric or psychosomatic conditions. Additionally, psychiatric or psychotherapeutic intervention was deemed necessary for 62% of all patients [12]. While in another investigation involving dermatology, outpatients found that one-third of those experiencing pruritus had concurrent psychiatric disorders. This elevated prevalence of comorbid psychiatric conditions is similarly observed in pruritic skin diseases like urticaria [13].

Moreover, the high prevalence rates of both conditions might intersect and contribute to the overall burden on dermatology patients. These factors among dermatology patients can have a large impact on the quality of life of patients and further research exploring potential causal relationships between pruritis and depression is needed.

## LIMITATIONS

This study provides several strengths. The study utilized well-established assessment tools such as the 12-Item Pruritus Severity Scale (12-PSS) and the Patient Health Questionnaire-9 (PHQ-9) to evaluate the severity of pruritus and depression, respectively. This enhances the validity and reliability of the findings. However, the findings should be interpreted carefully due to several limitations. First, the study was conducted at a single dermatology clinic within the King Hussein Medical Center in Amman, Jordan. This limits the generalizability of the findings to a broader population, as the results may not be representative of other geographical locations or healthcare settings. The study utilized a cross-sectional design, which provides a snapshot of data at a single point in time. Longitudinal studies may offer insights into the temporal relationship between pruritus and depression and provide a better understanding of causality. The data collected relied on self-reported measures from patients, including the presence and severity of pruritus and depression. This introduces the possibility of response bias or misreporting, which could affect the accuracy of the results. Another major limitation of this study is the small size of patients which can produce false-positive results, or they over-estimate the magnitude of an association.



## CONCLUSION

Depression and pruritis were very common symptoms in our dermatology patient population, with over two thirds of patients suffering from depression and over half suffering from pruritis. Psychodermatology field is trending, and dermatologists are the sentinel for early detection of symptoms and should have a low threshold for psychiatric referral. Screening of Both conditions in dermatology patients is a must and further Improvements in therapeutics and patient care is required in order to improve patient's quality of life. Future studies should focus on investigating the association between depression and other skin diseases.

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