

## Anxiety, depression and quality of life in dermatology patients at a tertiary care hospital

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### Abstract

**Objective:** To compare the anxiety, depression and health-related quality of life of dermatology patients with healthy individuals in a tertiary care setting.

**Method:** The case-control study was conducted at the Pak-Emirates Military Hospital, Rawalpindi, Pakistan, from April to September 2022, and comprised adult outpatients and inpatients with diagnosed skin diseases. They were designated as group A, while healthy adults who did not suffer from any dermatological condition formed control group B. Data was collected using a questionnaire which in addition to demographic characteristics, comprised the Dermatology Life Quality Index and the Hospital Anxiety and Depression Scale. Data was analysed using SPSS 21.

**Results:** Of the 200 subjects with mean age  $30.21 \pm 12.09$  years, 100(50%) were in group A; 75(75%) males and 25(25%) females with mean age  $32.56 \pm 13.49$  years. The remaining 100(50%) subjects were in group B; 75(75%) males and 25(25%) females with mean age  $27.86 \pm 10.02$ . In group A, 71(71%) were outpatients and 29(29%) were inpatients. Quality of life and depression scores were significantly different between inpatients in group A and group B ( $p < 0.05$ ). The difference was significant between outpatients in group A and group B in all categories ( $p < 0.05$ ).

**Conclusion:** Dermatological diseases had a significant impact on the daily life and psychological health of patients.

**Key Words:** Anxiety, Depression, Dermatology, Health-related quality of life, Skin disease.

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### Introduction

Dermatological conditions are the diseases that affect the integumentary system. Although rarely life-threatening, they do affect a broad population in different capacities and have chronic implications that adversely affect quality of life (QOL)<sup>1,2</sup>. Dermatological conditions affect a large section of the population in Pakistan; the diseases with the highest case-specific incidence being eczema, infections and acne. In a recent study at a tertiary care centre in Lahore, eczema was the most common skin disease seen, affecting 31.07% patients. Among these patients, contact dermatitis (mainly hand eczema) accounted for the majority of cases (72.4%). Skin infections were seen in 28.16% patients<sup>3</sup>.

Depression is a disorder marked by chronic suffering and poor overall health with negative impact on psychosocial, academic, vocational and family functioning<sup>4</sup>. Anxiety is a common and often debilitating mental health condition

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that can manifest in a variety of ways, including physical symptoms, such as sweating, racing heart and shortness of breath, as well as cognitive symptoms, such as worry, rumination and fear. These symptoms may or may not coexist with depression<sup>5</sup>. Both depression and anxiety have significant adverse effects on QOL<sup>6</sup>, which is defined as an individual's perception of their position in life in the context of culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns<sup>7</sup>.

The current study was planned to compare the mental health and health-related QOL (HR-QOL) of dermatology patients with healthy controls, and to investigate factors that could influence the two parameters.

### Subjects and Methods

The case-control study was conducted at the Pak-Emirates Military Hospital (PEMH), Rawalpindi, Pakistan, from April to September 2022. After approval from the ethics review committee of Army Medical College (AMC), Rawalpindi, the sample was raised using non-probability convenience sampling technique. Those included were adult outpatients and inpatients with diagnosed skin diseases who were designated as group A, while healthy adults matched for age and gender who did not suffer from any dermatological condition or significant comorbidity formed control group B. Patients aged <18

years, those with congenital abnormalities and severe psychosis, and those who did not volunteer to participate were excluded. The sample size was calculated using the Epitools calculator<sup>8</sup> with expected proportion in controls 0.1, assumed odds ratio 2.7<sup>9</sup>, confidence level 0.9, power 0.8 level and study type case-control. Approximately 11 percent of the population in Islamabad suffers from dermatological conditions which gives us the expected proportion of disease in the controls to be 0.1<sup>10</sup>.

After taking informed consent from the participants, data was collected using a questionnaire. Both English and Urdu versions of the questionnaire were handed out to the subjects who filled it out according to personal preference of language. Illiterate subjects were interviewed in order to accurately fill out the forms on their behalf.

The first part of the questionnaire recorded sociodemographic and disease-related characteristics of the subjects, including age, gender, education, marital status, weight, height, body mass index (BMI), occupational status, residence, self-reported socioeconomic status (SES), religious beliefs, stressful events during the preceding 6 months, physical comorbidities, medications being taken, the diagnosed skin diseases, and the duration of the diseases.

Mental health of the participants was assessed using the Hospital Anxiety and Depression Scale (HADS)<sup>11</sup>, which is a validated questionnaire that uses 7 statements each to assess depression (HADS-D) and anxiety (HADS-A) levels of the patients. Each statement is scored on a scale of 0-3. For each dimension of depression and anxiety, a score 0-7 is considered normal, 8-10 borderline, and 11-21 indicates a need for further examination or treatment.

QOL was measured using the Dermatology Life Quality Index (DLQI)<sup>12</sup>, which contains 10 questions related to the dermatological condition related to QOL experienced during the preceding week. Each question is scored on a 4-point Likert scale, ranging from 0 = very much to 3 = not at all. The scores are added, and range 0-30. A higher score depicts a greater QOL impairment. A score of 0-1 depicts no effect at all on patient's life, score 2-5 means there is a small effect, score 6-10 shows a moderate effect, score 11-20 illustrates a very large effect, and score 21-30 shows an extremely large effect on patient's life.<sup>12</sup>

Data was analysed using SPSS 21. Categorical variables were analysed for significance using chi-square test. DLQI and HADS outcomes were compared using chi-square test and odds ratios (ORs), with cut-off scores for clinically significant cases being 6 for DLQI<sup>13</sup>, and 8 for HADS<sup>14</sup>.

For two categorical variables, chi-square test was used, while for continuous variables, student's t-test was used. Analysis of variance (ANOVA) was used for variables with more than two outcome categories.  $P < 0.05$  was considered significant.

## Results

Of the 200 subjects with mean age  $30.21 \pm 12.09$  years, 100(50%) were in group A; 75(75%) males and 25(25%) females with mean age  $32.56 \pm 13.49$  years. The remaining 100(50%) subjects were in group B; 75(75%) males and 25(25%) females with mean age  $27.86 \pm 10.02$ . In group A, 71(71%) were outpatients and 29(29%) were inpatients. Among the inpatients, the most common indication for

**Table-1:** Sociodemographic characteristics (N=200).

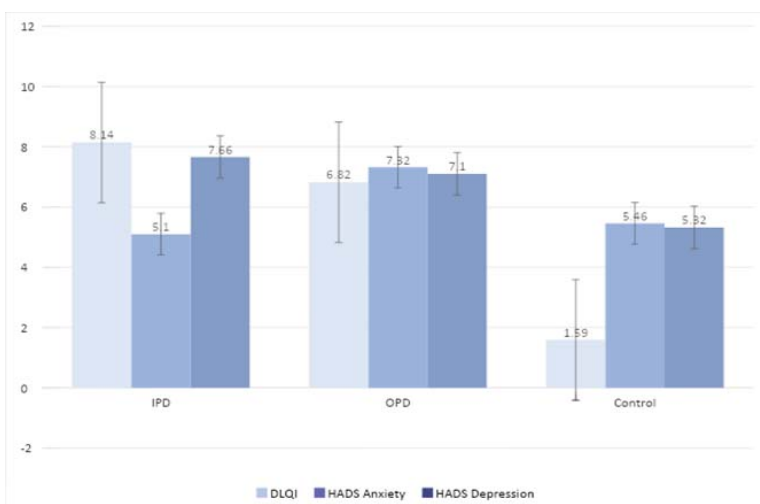
Variables	Cases N=100	Controls N=100	P-value
<b>Gender [MD=0]</b>			
Male	75	75	1.000
Female	25	25	
Mean age (years)	$32.56 \pm 13.49$	$27.86 \pm 10.02$	
Male	33.87 (14.41 %)	28.53 (10.16%)	0.006*
Female	28.64 (9.43%)	25.84 (9.52%)	
<b>Marital status [MD=0]</b>			
Not married	37	61	
Married	62	37	0.004*
Divorced	1	1	
Widowed	0	1	
<b>Occupation [MD=0]</b>			
Business/property ownership	0	3	
Government service	14	11	
Military service	40	34	
Private practice	5	2	0.009*
Labourer	5	0	
Retired	5	1	
Unemployed	4	8	
Student	17	34	
Housewife	10	7	
<b>Residence [MD=10]</b>			
Rural	35	22	0.171
Suburban	3	4	
Urban	59	67	
<b>Socioeconomic status [MD=66]</b>			
Low	28	21	0.039*
Middle	37	23	
High	8	17	
<b>Stressful life events [MD=0]</b>			
Yes	72	63	0.174
No	28	37	
<b>Comorbidity presence [MD=0]</b>			
Yes	39	19	0.002*
No	61	81	
Body Mass Index (SD)	23.24 (3.83)	23.10 (3.76)	0.8

MD: Missing data; SD: Standard deviation; \* = Significant.

**Table-2:** Distribution of subjects by DLQI, HADS outcome categories.

Outcome	Cases N=100	Controls N=100	p-value	Odds ratio
Affected	48	8	<0.001*	10.615
Non-affected	52	92		
HADS Anxiety				
Affected	32	26	0.35	1.339
Non-affected	68	74		
HADS Depression				
Affected	41	25	0.016*	2.085
Non-affected	59	75		
DLQI	Case N=100	Control N=100	Total	P-value (alpha=0.005)
No effect at all on patient's life (0-1)	18	62	80	<0.001*
Small effect on patient's life (2-5)	34	30	64	0.548
Moderate effect on patient's life (6-10)	25	8	33	0.014*
Very large effect on patient's life (11-20)	15	0	15	<0.001*
Extremely large effect on patient's life (21-30)	8	0	8	0.003*
HADS	Case N=100	Control N=100	Total	P-value (alpha=0.008)
<b>Anxiety</b>				
Normal (0-7)	68	74	142	0.368
Borderline abnormal (8-10)	11	11	22	1
Abnormal (11-21)	21	15	36	0.271
<b>Depression</b>				
Normal (0-7)	59	75	134	0.016
Borderline abnormal (8-10)	16	16	32	1
Abnormal (11-21)	25	9	34	0.002*

DLQI: Dermatology life quality index, HADS: Hospital anxiety and depression scale;  
DLQI cut-off: 6, HADS cut-off: 8 \* = significant.



**Figure:** Comparison of mean Dermatology Life Quality Index (DLQI) and Hospital Anxiety and Depression Scale (HADS) scores of inpatients (N=29), outpatients (N=71) and controls (N=100). IPD: Inpatient department, OPD: Outpatient department.

admission was cutaneous leishmaniasis 16(55.2%). Among the outpatients, 12(17%) had acne and 10(14%) had eczema, followed by dermatitis, miliaria, fungal infection, psoriasis, skin allergy, bacterial infection, pruritus, vitiligo and miscellaneous disorders (Table 1).

Mean DLQI score of male patients was  $6.95 \pm 6.46$ , while that of the female patients was  $7.96 \pm 7.53$  ( $p=0.516$ ). Male patients scored a mean of  $5.85 \pm 4.30$  on the HADS-A, while female patients scored  $9.16 \pm 5.97$  ( $p=0.015$ ). Mean HADS-D scores of male and female patients were  $6.88 \pm 4.30$  and  $8.40 \pm 6.08$ , respectively ( $p=0.255$ ). Age had no significant correlation with DLQI ( $p=0.693$ ), HADS-A ( $p=0.424$ ) or HADS-D ( $p=0.543$ ) scores.

The mean DLQI, HADS-A and HADS-D scores of group A patients were  $7.20 \pm 6.72$ ,  $6.68 \pm 4.96$  and  $7.26 \pm 4.82$ , respectively. Inpatients scored the highest on both DLQI and HADS-D scales, while outpatients scored the highest on HADS-A. The difference was significant ( $p<0.05$ ) between inpatients and controls with respect to DLQI and HADS-D, and between outpatients and controls in all categories, while the difference was not significant between inpatients and outpatients within group A (Figure).

The subjects were divided into affected and non-affected groups along with different subcategories for DLQI, HADS-A and HADS-D scores, showing, among other things, that 25(25%) patients in group A needed treatment for depression compared to 9(9%) controls in group B ( $p<0.05$ ) (Table 2).

## Discussion

The results showed that patients with skin diseases presenting at a tertiary care hospital were significantly more likely to have depression (OR: 2.09) and low dermatology related QOL (OR: 10.62) compared to healthy controls. The presence of skin disease was not significantly associated with the occurrence of anxiety. The worsening of QOL may be two-fold, with somatic effects directly caused by the skin disease contributing towards psychological symptomatology, which in turn could cause further worsening of QOL<sup>15</sup>.

These results represented part of an important problem in Rawalpindi and neighbouring areas where the dermatological disease burden has

been highly underestimated<sup>16</sup>. A study investigating the pattern of skin diseases in Pakistan found that there was a similar occurrence of skin diseases in all parts of the country, with the most common diagnosis being infections<sup>17</sup>. The unusually high occurrence of cutaneous leishmaniasis in the current study was due to the tertiary care hospital receiving military personnel serving in regions with a large number of Afghan refugees near the border with Afghanistan, where the disease is common<sup>18</sup>.

Related studies in Pakistan have shown similarly poor outcomes on DLQI assessment. A cross-sectional study in Quetta showed patients of skin disease had a mean DLQI score of  $16.76 \pm 2.54$ <sup>19</sup>. The difference is likely attributed to the difference in SES of subjects in both the studies. This study as well as others<sup>20</sup> have proven that low SES is associated with poorer HR-QOL. In a study<sup>19</sup>, >70% of the sample had income <PKR20,000, which was below the lower bracket of monthly income for low SES in the current study. The lower variance in the mean was attributed to a larger sample size. Another study conducted in southern Pakistan found the DLQI scores among patients of skin disease was  $10.02 \pm 4.09$ <sup>20</sup>. This study found that increased disease duration was correlated with a higher DLQI score.

Despite the abundance of data regarding dermatological and psychiatric disease burden in Pakistan<sup>16,17</sup>, no study has investigated the relation between the two. Moreover, in our part of the world, the investigations of the relationship between skin disease and QOL have been limited to cross-sectional studies, from which it is difficult to ascertain cause-effect relationships. The current case-control study gives a more precise assessment of the effect of skin disease on the QOL and mental health of dermatological outpatients and inpatients compared to the healthy individuals.

The current results showed a 21% prevalence of anxiety and a 25% prevalence of depression in dermatological patients, as measured by HADS. A similar case-control study in European countries found anxiety and depression prevalence among patients of skin disease to be 17% and 10%, respectively<sup>21</sup>. This difference may be attributed to factors that influence psychiatric comorbidity other than those related to skin, such as SES, human development index, accessibility of primary care and literacy<sup>22-24</sup>.

In the current study, inpatients were found to suffer a greater impairment of QOL compared to outpatients. This may be because of the difference in diseases and their severity, as most of the inpatients had cutaneous leishmaniasis, a much more debilitating disease than

acne, which was the most common diagnosis in outpatients. The difference also arose because only the most high-risk patients were admitted in the dermatology ward due to the limited number of beds.

One rather unusual finding of the current study was that anxiety levels were lower among inpatients than outpatients. This is in contrast to a similar study which found anxiety to be much higher in inpatients than in outpatients<sup>25</sup>. It is difficult to explain the difference in current and previous results. It was observed at the time of interviewing, however, that the environment of the dermatology ward was quite healthily social, with patients having amicable interaction with each other and the staff. This would have had an improvement on patient satisfaction<sup>26</sup> and alleviation of symptoms of anxiety. More research is needed to ascertain this relationship. Most of the inpatients were serving military personnel, and this could also explain the lower anxiety levels, as hospitalisation would have presented a comparatively less stressful environment than the regular area of deployment of such patients.

A study in a tertiary care hospital in Saudi Arabia showed high QOL impairment among patients, with varying DLQI scores depending on the type of skin disease<sup>27</sup>. The mean DLQI score was  $8.32 \pm 7.1$ . The mean score with high standard deviation in the current study was in concordance with this finding. However, not all studies have found significant impairment in QOL among patients, with a study in Saudi Arabia, which used the Skindex-16 tool, reporting a good QOL in 69% of the subjects<sup>27</sup>.

Females had a higher mean DLQI score than males in the current study, but the difference was not significant. This was in contrast to a study in Denmark, which found females to experience substantially greater impairment in skin-related QOL than males<sup>25</sup>. The difference could be due to the cultural variations. In Pakistan, the dominant religious beliefs and social norms require women to wear less skin-revealing attire, so visible skin lesions are less impactful in their daily lives. This is reflected by various cross-sectional studies in the region that showed non-significant differences in disease-related QOL between males and females<sup>19,20</sup>. However, this trend is highly variable in other parts of the world with the same religious values, with studies in the Middle East describing strong associations of gender and QOL impairment<sup>27,28</sup>.

There were also no significant gender differences in mean HADS-D scores in the current study. However, female patients scored significantly higher on HADS-A than males. This was in line with a study which found



significant gender differences in anxiety in the general population<sup>29</sup>.

Age was not found to be a significant determinant of dermatological or psychological symptomatology in the current study. This was in contrast to earlier findings<sup>25</sup>, which reported an inverse relation between age and the parameters measured. However, some cross-sectional studies have found no relation of age with severity of symptoms<sup>19,27</sup>, indicating that the variations could be due to differences in demographics, subject recruitment, study settings, methodologies being employed, and the endemicity of diseases.

The current study had its limitations, including a low sample size, which underrepresented inpatients and females. Also, the findings were not generalisable, as most participants were of military background at a single centre. The duration of the disease, which could have had an impact on disease knowledge and management, was not measured. Additionally, the study did not measure afflicted areas of skin, which could have assessed disease severity. Age, SES and comorbidities could not be appropriately controlled. Some of the patients, especially females, were reluctant to share intimate details about their personal and social lives. Their answers to some questions may not have been a true reflection of their feelings and experiences at the time.

In the light of the findings, factors that contribute to worsening symptoms and require consideration in management included the female gender and hospitalisation, but special attention should also be given to other factors, like age, SES and the presence of somatic comorbidity. Clinical intervention should also focus on improving the mental health of the patients.

## Conclusion

Dermatological conditions were found to have far-reaching clinical implications beyond cosmetic appearances that affected the psychosocial health of the patients, like other debilitating illnesses. Skin diseases had a direct as well as an indirect adverse effect on the QOL of the patients, which may influence their perception and approach to treatment.

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#### Authors' Contribution:

**AH:** Concept, devising methodology, result write-up and final approval.

**HZ, AA:** Reframing objective with operational definitions, literature

review, writing, data collection, entry, analysis and referencing.

**RSSB, MRH:** Writing, literature review and referencing.