

ASSESSING THE EFFECTS OF SEBORRHEIC DERMATITIS AMONG UNIVERSITY STUDENTS IN SIALKOT, PAKISTAN

M. Farhan Saleem¹, M. Anas Shahzad^{*2}, Salwa Razzaq³, Mahanoor Sagheer⁴, Qasim Javed⁵, Rida Akram⁶, Rabia Haseeb⁷, Samia Mureed⁸

^{1,2*,3,4,5,6,7,8}Imran Idrees College of Pharmacy, Sialkot
anasshahzad1258@gmail.com*

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Corresponding Author: *

M. Anas Shahzad

Abstract

Background: Seborrheic dermatitis (SD) is a chronic, relapsing inflammatory skin condition affecting sebaceous gland-rich areas primarily the scalp, face, eyebrows, and ears and is characterized by persistent scaling, erythema, and pruritus. Although there is no substantial medical risk, its recurrent and obvious character can progressively damage a person's emotional health, social comfort, and sense of self-worth. Despite this, the majority of current research tends to concentrate only on clinical presentations and disease severity, leaving the lived experience of patients especially young students juggling a chronic skin illness with high academic pressures largely unexplored. It is challenging to comprehend the actual burden of the illness and create really patient-centered care because of this gap.

Objective: The purpose of this study was to evaluate the effect of seborrheic dermatitis on quality of life (QoL) among university students in Sialkot, Pakistan, and to investigate the ways in which clinical and demographic factors, such as gender, age, field of study, affected anatomical site, and duration of the disease, affect both the severity of the disease and quality of life outcomes specific to dermatology.

Methodology: A cross-sectional observational study was conducted between February and April 2026 among 250 university students in Sialkot, Pakistan, with a clinically confirmed diagnosis of SD. Participants were gathered from associated dermatological outpatient clinics and university campuses. Validated instruments evaluating disease severity and dermatology-specific quality of life (DLQI) were used to gather data. One-way ANOVA and independent-samples t-tests were used in the statistical analyses, with a significance level of $p < 0.05$.

Results: Pharm-D students made up the majority of the sample (52.4%), which was predominately female (54.4%). The most commonly afflicted area (49.6%) was the scalp. While women felt a greater burden on their quality of life, especially in the emotional and everyday functioning categories, men reported far higher illness severity ratings. Compared to those in their early twenties, younger participants (less than 20 years old) had less severe illness. Higher symptom and daily interference ratings were strongly associated with scalp involvement. Interestingly, patients with four to five years of illness had the most severe symptoms, whereas those with one to two years of illness had the most impaired quality of life. This suggests that early-stage patients may have greater difficulty adjusting and managing.

Conclusion: University students who suffer from seborrheic dermatitis have a quantifiable and substantial psychological cost that varies significantly by

gender, age, illness location, and duration. These results stress the necessity for comprehensive, patient-centered therapy that incorporates mental health awareness, patient education, and individualized treatment approaches. They also show the limits of solely clinical evaluations.

1. Introduction

Seborrheic Dermatitis (SD) is a chronic recurrent inflammatory skin condition that mostly affects areas rich in sebaceous (oil) glands and is marked by erythema (redness), greasy scaling, and itching. It is not communicable and has periods of remission and exacerbation throughout time. It is regarded as a component of a range of seborrheic conditions, from minor dandruff to more severe inflammatory illness (Clinical Professor of Pediatrics, University of Calgary, Pediatric Consultant, Alberta Children's Hospital, Canada. et al., 2015). Although the precise cause is unknown, seborrheic dermatitis is believed to be caused by a complex interplay between: elevated activity of the sebaceous glands, an unusual immunological reaction, *Malassezia* species overgrowth (lipophilic yeasts typically seen on the skin), and environmental and genetic influences (Etiology and Management of Seborrheic Dermatitis | Dermatology | Karger Publishers, n.d.).

Frequency: About 1-5% of adults worldwide suffer from seborrheic dermatitis, one of the most prevalent dermatological disorders. In some groups, its occurrence rises noticeably: during the first three months of life, up to 70% of infants (as cradle cap); adults between the ages of 30 and 60, especially men; and immunocompromised people, such as those suffering from neurological conditions, Parkinson's disease, or HIV/AIDS. Due to increased androgen-driven sebaceous activity, males are more likely than females to be afflicted (SEBORRHEIC DERMATITIS, SCOPING REVIEW by Ana Belén Valero Martillo, Valeria Marilú González Ortiz, Ronald Bolívar Fariás Requielme, Johanna Maribel Astudillo Romero, José Eduardo Cango Chamba, Bryam Esteban Coello García, n.d.). All ethnic groups and climates are affected, however symptoms may get worse in dry, cold weather and get better in the summer.

Chronic Character: As a chronic and recurrent disorder, seborrheic dermatitis lasts for extended periods of time and alternates between

flare-ups and remissions (Seborrheic Dermatitis: Current Issues of Etiopathogenesis and Current Therapeutic Options | Sanikidze | Medical Alphabet, n.d.). There isn't a cure yet, but there are effective therapies that can manage symptoms. Exacerbations could be brought on by stress, weariness or sickness, changes in hormones, seasonal fluctuations (particularly in the winter), and inadequate skin care habits. Seborrheic dermatitis frequently necessitates long-term management rather than short-term treatment due to its apparent form and propensity for return. To keep symptoms under control and stop recurrence, therapy must usually be either continuous or intermittent (Seborrheic Dermatitis: Exploring the Pathogenesis, Clinical Features, And Treatment Strategies | Iris Publishers, n.d.) (Bukvić Mokos et al., 2012).

Frequently Affected Regions: Sebaceous gland-rich areas are primarily affected by seborrheic dermatitis, including: the scalp – the most commonly impacted area – which manifests as thick, oily scales or dandruff; the face, especially the forehead, behind the ears, eyebrows, eyelids, and nasolabial folds; the ears, including post-auricular areas and the external auditory canal; the upper back and chest, particularly the presternal region; and intertriginous regions – less frequently, the groin and axillae. Seborrheic dermatitis typically affects the face, diaper area, and scalp (cradle cap) in infants (Seborrheic Dermatitis in Skin of Color: Clinical Considerations | Semantic Scholar, n.d.).

Etiology and Pathophysiology of Seborrheic Dermatitis: Seborrheic dermatitis (SD) is a multifactorial inflammatory skin condition that is characterized by a combination of environmental factors, immune dysregulation, microbial factors, sebaceous gland activity, and genetic predisposition. There is strong evidence that *Malassezia* yeasts, sebum production, and aberrant cutaneous immune responses interact intricately, even if the exact mechanism is still unclear (Turchin et al., 2025a).

Malassezia's Function: Lipophilic yeasts called *Malassezia* species are a natural component of the skin microbiota, especially in sebum-rich areas. The pathophysiology of seborrheic dermatitis is thought to be primarily driven by an aberrant host response to these organisms rather than just overgrowth (Frontiers | Cutaneous *Malassezia*: Commensal, Pathogen, or Protector? n.d.). Mechanisms involved include: *Malassezia* species using lipase enzymes to break down the triglycerides in sebum, resulting in the production of free fatty acids and lipid byproducts; these metabolites increasing trans-epidermal water loss and making it easier for irritants to penetrate the skin barrier; and free fatty acids acting as pro-inflammatory mediators, causing cytokine release and keratinocyte activation (Galizia et al., 2024). Antifungal treatments lessen symptoms, demonstrating *Malassezia*'s critical role in disease activity. Crucially, people with SD show increased inflammatory sensitivity to the yeast, but *Malassezia* density may not necessarily be noticeably higher in afflicted skin.

Sebum Production and Sebaceous Gland Activity: Seborrheic dermatitis primarily affects areas rich in sebaceous glands, emphasizing the role of sebum in the development of the disease (Перламутров & Новикова, 2025). Sebum fosters the growth of *Malassezia* by offering a nutrient-rich lipid environment. Androgens have an impact on increased sebaceous activity, which explains why it is more common in men and starts after puberty. Sebum composition changes may favor inflammatory lipid metabolites more than just quantity (Seborrheic Dermatitis—Looking beyond *Malassezia* - Wikramanayake - 2019 - Experimental Dermatology - Wiley Online Library, n.d.). Higher SD prevalence is seen in neurological conditions like Parkinson's disease that are linked to greater seborrhea, supporting the connection between sebaceous activity and illness manifestation. Thus, sebum contributes to local inflammation and acts as a substrate for microbial metabolism (Bhujbal et al., 2024).

Inflammatory and Immune Dysregulation: Abnormal innate and adaptive immune responses to skin microbiota and barrier disruption cause inflammation in seborrheic dermatitis (Seborrheic Dermatitis: Exploring the

Complex Interplay with *Malassezia*, n.d.). Immunopathological characteristics include increased production of pro-inflammatory cytokines (e.g., IL-1, IL-6, TNF- α) resulting from keratinocyte activation; more frequent infiltration of T lymphocytes, dendritic cells, and macrophages in the afflicted skin; dysregulated T-helper cell responses, specifically Th1 and Th17 pathways; and decreased tolerance to the local immune system, particularly in those with impaired immune systems. The crucial role of immune modulation in disease pathogenesis is shown by the correlation between severe seborrheic dermatitis and HIV infection, where immunological dysfunction is prevalent.

1.1 Aims and Objectives

1. To ascertain the frequency and distribution of seborrheic dermatitis among college students based on factors such as gender, age group, field of study, afflicted anatomical location, and length of illness.
2. To compare disease severity across demographic categories and evaluate participant disease severity using standardized clinical rating instruments.
3. To use the DLQI to quantify quality of life impairment specific to dermatology and investigate how it varies by gender, age, educational background, place of involvement, and length of the condition.
4. To determine which sub-groups bear the most burden and investigate the connection between illness severity and quality-of-life outcomes.
5. To offer evidence-based suggestions for incorporating patient-centered therapies and psychological evaluation into the therapeutic treatment of seborrheic dermatitis in student populations.

2. Methodology

2.1 Study Population

Participants were recruited from university campuses and affiliated dermatology outpatient clinics in Sialkot. Eligible participants were students aged 16 years or older with a clinically confirmed diagnosis of seborrheic dermatitis established through dermatological examination by qualified clinicians. Participants were required to be able to read and independently

complete the study questionnaire and provide written informed consent.

Individuals younger than 16 years, those with concurrent dermatological conditions other than seborrheic dermatitis, those with systemic diseases that could substantially affect quality-of-life assessments, and those who submitted incomplete questionnaires were excluded. A total of 250 participants met the eligibility criteria and were included in the final analysis.

2.2 Data Collection

Data collection was performed by trained student researchers who received standardized instruction regarding study procedures and eligibility criteria. Participants were identified with the assistance of dermatologists and completed the study questionnaire independently to minimize interviewer and response bias. Questionnaires were reviewed for completeness prior to inclusion in the final dataset.

2.3 Statistical Analysis

Statistical analyses were performed using statistical software. Continuous variables were summarized as mean $\pm$ standard deviation (SD), while categorical variables were presented as frequencies and percentages. Comparisons

between two groups were conducted using independent-samples *t*-tests, whereas comparisons among three or more groups were performed using one-way analysis of variance (ANOVA). A two-sided *p*-value <0.05 was considered statistically significant. Subgroup analyses were performed according to gender, age group, field of study, affected anatomical site, and disease duration to evaluate associations with disease severity and quality-of-life outcomes.

3. Results

3.1 Socio-demographic Characteristics

A total of 250 participants were included, comprising 114 males (45.6%) and 136 females (54.4%). The largest age group was <20 years ($n=90$, 36.0%), followed by 30–35 years ($n=54$, 21.6%). Most participants were Pharm-D students ($n=131$, 52.4%), followed by MBBS students ($n=90$, 36.0%) and Allied Health Sciences students ($n=29$, 11.6%). The scalp was the most commonly affected site ($n=124$, 49.6%), followed by the face ($n=86$, 34.4%). Disease duration was relatively evenly distributed, with the largest proportion reporting a duration of 3–4 years ($n=58$, 23.2%) (Table 3.1).

Table 3.1 Socio-demographic Characteristics of Participants

Variable	Category	Frequency	Percentage
Age	less than 20	90	36.0%
	30-35	54	21.6%
	20-24	47	18.8%
	25-29	41	16.4%
	36 or greater	18	7.2%
Gender	Female	136	54.4%
	Male	114	45.6%
Field	Pharm-D	131	52.4%
	MBBS	90	36.0%
	Allied Health Sciences	29	11.6%
Affected Areas	Scalp	124	49.6%
	Face	86	34.4%

Variable	Category	Frequency	Percentage
	Eyebrows	23	9.2%
	Ears	12	4.8%
	Chest	5	2.0%
Duration	3-4 years	58	23.2%
	Less than 1 year	56	22.4%
	1-2 years	50	20.0%
	2-3 years	50	20.0%
	4-5 years	36	14.4%

3.2 Gender Comparison

Gender-based comparisons showed significant differences for SD5, disease severity, and DQL10. Males reported higher SD5 scores (3.53 ± 0.69 vs. 3.29 ± 0.79 , $p=.015$) and disease

severity scores (2.47 ± 0.23 vs. 2.39 ± 0.29 , $p=.026$), whereas females had higher DQL10 scores (3.82 ± 0.77 vs. 3.46 ± 0.89 , $p=.001$). No significant differences were observed for the remaining variables (Table 3.2).

Table 3.2 Gender Comparison of Study Variables

Variable	Male (n=114) Mean $\pm$ SD	Female (n=136) Mean $\pm$ SD	p-value
Age	2.51 $\pm$ 1.33	2.40 $\pm$ 1.38	.546
Field of Study	1.56 $\pm$ 0.65	1.62 $\pm$ 0.72	.522
Affected Areas	1.81 $\pm$ 0.96	1.71 $\pm$ 0.94	.403
Duration of SD	2.96 $\pm$ 1.38	2.79 $\pm$ 1.38	.330
SD1	1.95 $\pm$ 0.22	1.98 $\pm$ 0.15	.198
SD2	3.47 $\pm$ 1.12	3.65 $\pm$ 0.99	.195
SD3	3.57 $\pm$ 1.00	3.70 $\pm$ 0.94	.298
SD4	3.57 $\pm$ 1.06	3.60 $\pm$ 1.06	.850
SD5	3.53 $\pm$ 0.69	3.29 $\pm$ 0.79	.015*
DI1	3.47 $\pm$ 0.67	3.49 $\pm$ 0.68	.825
DI2	3.39 $\pm$ 0.75	3.43 $\pm$ 0.70	.729
DI3	3.41 $\pm$ 0.98	3.35 $\pm$ 0.90	.619
DI4	3.47 $\pm$ 0.99	3.60 $\pm$ 0.95	.321
DI5	3.28 $\pm$ 0.76	3.13 $\pm$ 0.83	.145
DQL1	3.36 $\pm$ 1.32	3.49 $\pm$ 1.25	.415
DQL2	3.56 $\pm$ 1.19	3.65 $\pm$ 1.13	.560
DQL3	3.27 $\pm$ 1.21	3.29 $\pm$ 1.18	.884
DQL4	3.00 $\pm$ 1.12	3.14 $\pm$ 1.13	.329

Variable	Male (n=114) Mean $\pm$ SD	Female (n=136) Mean $\pm$ SD	p-value
DQL5	3.35 $\pm$ 1.14	3.44 $\pm$ 1.19	.543
DQL6	3.20 $\pm$ 1.36	3.19 $\pm$ 1.38	.952
DQL7	3.54 $\pm$ 1.34	3.51 $\pm$ 1.31	.903
DQL10	3.46 $\pm$ 0.89	3.82 $\pm$ 0.77	.001**
Clinical Signs	3.36 $\pm$ 0.46	3.34 $\pm$ 0.46	.782
Disease Severity	2.47 $\pm$ 0.23	2.39 $\pm$ 0.29	.026*
DLQI	3.52 $\pm$ 0.42	3.45 $\pm$ 0.43	.163

Significant p-values: * $p < .05$ ** $p < .01$

3.3 Age Group Comparison

Across age groups, disease severity was the only variable that differed significantly ($p=.013$). Participants aged <20 years had the lowest mean disease severity score (2.38 ± 0.27), whereas those

aged 20–24 years had the highest score (2.53 ± 0.36). No significant differences were observed for SD, DI, DQL, or other clinical measures (Table 3.3).

Table 3.3 Age Group Comparison of Study Variables

Variable	<20 (n=90)	20–24 (n=47)	25–29 (n=41)	30–35 (n=54)	≥ 36 (n=18)	Total (n=250)	p
Gender	1.60 $\pm$ 0.49	1.47 $\pm$ 0.50	1.51 $\pm$ 0.51	1.54 $\pm$ 0.50	1.56 $\pm$ 0.51	1.54 $\pm$ 0.50	.664
Field of Study	1.58 $\pm$ 0.72	1.72 $\pm$ 0.65	1.61 $\pm$ 0.74	1.48 $\pm$ 0.69	1.61 $\pm$ 0.50	1.59 $\pm$ 0.69	.532
Affected Areas	1.72 $\pm$ 0.87	1.77 $\pm$ 1.07	1.76 $\pm$ 0.97	1.74 $\pm$ 0.96	1.89 $\pm$ 1.02	1.75 $\pm$ 0.95	.976
Duration of SD	2.89 $\pm$ 1.30	2.98 $\pm$ 1.26	2.80 $\pm$ 1.49	2.98 $\pm$ 1.43	2.33 $\pm$ 1.61	2.87 $\pm$ 1.38	.482
SD1	1.98 $\pm$ 0.15	1.98 $\pm$ 0.15	1.93 $\pm$ 0.26	1.94 $\pm$ 0.23	2.00 $\pm$ 0.00	1.96 $\pm$ 0.19	.455
SD2	3.56 $\pm$ 1.04	3.72 $\pm$ 1.12	3.46 $\pm$ 1.05	3.50 $\pm$ 1.08	3.67 $\pm$ 0.91	3.57 $\pm$ 1.05	.770
SD3	3.69 $\pm$ 0.92	3.66 $\pm$ 0.94	3.61 $\pm$ 0.92	3.56 $\pm$ 1.06	3.83 $\pm$ 0.79	3.64 $\pm$ 0.96	.799
SD4	3.53 $\pm$ 1.14	3.53 $\pm$ 0.80	3.39 $\pm$ 0.74	3.31 $\pm$ 0.80	3.39 $\pm$ 0.85	3.40 $\pm$ 0.88	.868
SD5	3.39 $\pm$ 0.69	3.55 $\pm$ 0.65	3.39 $\pm$ 0.67	3.57 $\pm$ 0.60	3.39 $\pm$ 0.85	3.43 $\pm$ 0.67	.711
DI1	3.46 $\pm$ 0.69	3.55 $\pm$ 0.65	3.41 $\pm$ 0.74	3.46 $\pm$ 0.72	3.28 $\pm$ 0.67	3.45 $\pm$ 0.70	.597
DI2	3.33 $\pm$ 0.75	3.19 $\pm$ 0.82	3.54 $\pm$ 1.07	3.33 $\pm$ 0.93	3.17 $\pm$ 0.86	3.31 $\pm$ 0.88	.437
DI3	3.48 $\pm$ 0.96	3.45 $\pm$ 0.90	3.59 $\pm$ 1.14	3.56 $\pm$ 0.95	3.44 $\pm$ 0.86	3.51 $\pm$ 0.97	.279
DI4	3.58 $\pm$ 0.96	3.30 $\pm$ 0.86	3.17 $\pm$ 0.83	3.22 $\pm$ 0.88	3.22 $\pm$ 0.81	3.32 $\pm$ 0.90	.932
DI5	3.14 $\pm$ 0.71	3.30 $\pm$ 0.86	3.17 $\pm$ 0.76	3.56 $\pm$ 0.95	3.33 $\pm$ 1.53	3.31 $\pm$ 0.88	.873
DQL1	3.43 $\pm$ 1.28	3.40 $\pm$ 1.22	3.34 $\pm$ 1.12	3.65 $\pm$ 1.10	3.89 $\pm$ 1.32	3.46 $\pm$ 1.19	.935
DQL2	3.56 $\pm$ 1.11	3.55 $\pm$ 1.28	3.61 $\pm$ 1.04	3.65 $\pm$ 1.09	3.17 $\pm$ 1.42	3.56 $\pm$ 1.16	.842

Variable	<20 (n=90)	20-24 (n=47)	25-29 (n=41)	30-35 (n=54)	≥36 (n=18)	Total (n=250)	p
DQL3	3.31±1.28	3.34±1.11	3.17±1.21	3.15±1.09	2.89±1.32	3.21±1.20	.964
DQL4	3.08±1.09	2.98±1.11	3.46±1.19	3.15±1.17	3.17±1.29	3.10±1.14	.853
DQL5	3.51±1.20	3.23±1.15	3.46±1.19	3.39±1.07	3.28±1.49	3.40±1.19	.626
DQL6	3.23±1.44	3.11±1.31	3.32±1.21	3.09±1.40	3.28±1.49	3.20±1.38	.917
DQL7	3.50±1.29	3.51±1.38	3.46±1.34	3.59±1.25	3.61±1.54	3.52±1.31	.987
DQL10	3.66±0.85	3.77±0.73	3.59±0.92	3.50±0.90	4.00±0.69	3.67±0.85	.208
Clinical Signs	3.27±0.47	3.36±0.49	3.43±0.38	3.38±0.46	3.35±0.43	3.35±0.46	.263
Disease Severity	2.38±0.27	2.53±0.36	2.47±0.12	2.41±0.21	2.35±0.27	2.43±0.26	.013*
DLQI	3.43±0.45	3.58±0.52	3.53±0.26	3.50±0.39	3.37±0.36	3.48±0.42	.223

Significant p-values: * $p < .05$

3.4 Field of Study Comparison

Comparisons by field of study demonstrated a significant difference only for disease severity ($p=.019$). Allied Health Sciences students reported the highest mean disease severity score

(2.49 ± 0.23), followed by MBBS (2.47 ± 0.28) and Pharm-D students (2.38 ± 0.25). All other variables were comparable across groups (Table 3.4).

Table 3.4 Field of Study Comparison of Study Variables

Variable	Pharm-D (n=131)	MBBS (n=90)	Allied Health (n=29)	Total (n=250)	p
Gender	1.54±0.50	1.51±0.50	1.66±0.48	1.54±0.50	.402
Affected Areas	1.73±0.87	1.86±1.09	1.52±0.83	1.75±0.95	.236
Duration of SD	2.90±1.40	2.86±1.31	2.79±1.50	2.87±1.38	.921
Age	2.47±1.37	2.51±1.39	2.21±1.21	2.45±1.36	.570
SD1	1.98±0.15	1.96±0.21	1.93±0.26	1.96±0.19	.422
SD2	3.60±1.12	3.49±0.99	3.66±0.94	3.57±1.05	.654
SD3	3.76±1.00	3.50±0.96	3.55±1.05	3.64±1.06	.136
SD4	3.35±0.76	3.49±0.72	3.34±0.81	3.40±0.76	.643
SD5	3.47±0.62	3.48±0.74	3.59±0.68	3.43±0.67	.379
DI1	3.38±0.73	3.42±0.69	3.52±0.78	3.41±0.72	.680
DI2	3.34±0.97	3.43±0.90	3.41±0.91	3.38±0.94	.648
DI3	3.43±1.03	3.66±0.89	3.69±0.85	3.54±0.97	.735
DI4	3.16±0.80	3.22±0.82	3.31±0.76	3.20±0.80	.152
DI5	3.44±0.80	3.50±0.81	3.17±0.76	3.43±0.80	.627

Variable	Pharm-D (n=131)	MBBS (n=90)	Allied Health (n=29)	Total (n=250)	p
DQL1	3.44±1.25	3.50±1.33	3.17±1.28	3.43±1.28	.486
DQL2	3.67±1.08	3.56±1.25	3.45±1.15	3.60±1.16	.587
DQL3	3.43±1.16	3.08±1.10	3.28±1.16	3.28±1.13	.101
DQL4	3.15±1.14	2.99±1.24	3.38±0.94	3.11±1.14	.529
DQL5	3.54±1.15	3.20±1.24	3.14±0.94	3.40±1.16	.100
DQL6	3.24±1.41	3.16±1.35	3.14±1.27	3.20±1.37	.885
DQL7	3.43±1.33	3.66±1.31	3.55±1.30	3.52±1.32	.448
DQL10	3.61±0.85	3.67±0.86	3.83±0.80	3.66±0.85	.455
Clinical Signs	3.33±0.47	3.35±0.44	3.41±0.45	3.35±0.46	.695
Disease Severity	2.38±0.25	2.47±0.28	2.49±0.23	2.43±0.26	.019*
DLQI	3.47±0.44	3.49±0.43	3.49±0.37	3.48±0.42	.952

Significant *p*-values: * *p* < .05

3.5 Affected Areas Comparison

Affected area was associated with significant differences in SD5, DI1, DI2, DI5 (all *p*<.001), and clinical signs (*p*=.041). Participants with

scalp involvement reported higher mean scores for SD5 (3.94±0.38) and DI1 (3.70±0.57) than participants with involvement of other sites (Table 3.5).

Table 3.5 Affected Areas Comparison of Study Variables

Variable	Scalp (n=124)	Face (n=86)	Eyebrows (n=23)	Ears (n=12)	Chest (n=5)	Total (n=250)	p
Gender	1.58±0.50	1.50±0.50	1.57±0.51	1.42±0.51	1.60±0.55	1.54±0.50	.698
Duration of SD	2.98±1.34	2.73±1.47	2.65±1.50	3.00±1.04	3.20±0.84	2.87±1.38	.617
Age	2.39±1.32	2.59±1.42	2.30±1.43	1.92±1.00	3.60±1.14	2.45±1.36	.138
Field of Study	1.66±0.73	1.47±0.63	1.61±0.72	1.75±0.62	1.60±0.55	1.59±0.69	.309
SD1	1.97±0.18	1.95±0.21	1.96±0.21	2.00±0.00	2.00±0.00	1.96±0.19	.913
SD2	3.67±1.04	3.53±1.08	3.39±1.08	3.17±0.94	3.40±0.89	3.57±1.05	.442
SD3	3.65±0.96	3.70±1.00	3.43±0.98	3.08±0.90	3.40±0.89	3.64±0.97	.645
SD4	3.63±0.66	3.17±0.75	2.91±0.90	3.50±0.52	3.60±0.89	3.40±0.76	.515
SD5	3.94±0.38	3.07±0.30	2.70±0.93	3.08±1.00	4.00±0.00	3.43±0.67	.000**
DI1	3.70±0.57	3.15±0.64	2.78±0.95	3.25±0.75	4.00±0.00	3.41±0.72	.000**
DI2	3.40±0.93	3.24±0.98	3.74±0.86	3.42±0.90	3.60±0.55	3.38±0.94	.000**
DI3	3.62±1.00	3.37±0.93	3.61±1.04	3.75±0.75	3.60±0.55	3.54±0.97	.240
DI4	3.48±0.73	2.91±0.71	2.74±1.01	3.17±0.58	3.60±0.89	3.20±0.80	.385

Variable	Scalp (n=124)	Face (n=86)	Eyebrows (n=23)	Ears (n=12)	Chest (n=5)	Total (n=250)	p
DI5	3.45±0.77	3.47±0.84	2.87±0.97	3.17±0.83	3.60±0.89	3.43±0.80	.000**
DQL1	3.64±1.17	3.74±1.08	3.26±1.32	3.58±1.38	3.20±1.64	3.43±1.28	.943
DQL2	3.34±1.15	3.36±1.19	2.91±1.31	3.08±1.16	2.80±1.48	3.28±1.20	.115
DQL3	3.02±1.10	3.20±1.08	2.83±1.15	3.08±1.38	3.40±1.30	3.08±1.13	.409
DQL4	3.36±1.11	3.59±1.16	2.87±1.29	3.42±1.24	3.40±1.52	3.40±1.17	.592
DQL5	3.23±1.39	3.26±1.37	2.91±1.24	3.00±1.48	3.00±1.41	3.20±1.37	.812
DQL6	3.47±1.35	3.66±1.25	3.22±1.24	3.75±1.60	3.40±1.52	3.52±1.32	.591
DQL7	3.70±0.78	3.64±0.89	3.52±1.04	3.67±0.89	3.40±0.89	3.66±0.85	.841
DQL10	3.32±1.39	3.66±1.26	2.83±0.98	3.75±1.60	3.40±1.34	3.52±1.32	.122
Clinical Signs	3.31±0.50	3.36±0.41	3.35±0.36	3.72±0.25	3.12±0.45	3.35±0.46	.041*
Disease Severity	2.40±0.32	2.45±0.22	2.46±0.15	2.53±0.05	2.37±0.17	2.43±0.26	.397
DLQI	3.46±0.44	3.50±0.41	3.54±0.36	3.50±0.45	3.48±0.51	3.48±0.42	.874

Significant *p*-values: * *p* < .05 ** *p* < .001

3.6 Duration Comparison

Disease duration was significantly associated with gender distribution (*p*=.017), SD1 (*p*=.001), SD2 (*p*=.045), SD3 (*p*=.037), SD4 (*p*<.001), SD5 (*p*=.040), DQL10 (*p*=.024), and total DLQI score (*p*=.031). Participants with

disease duration of 4–5 years reported the highest scores for SD3 (4.50±0.94) and SD4 (4.50±0.94), whereas the 1–2-year group reported the highest DQL10 (3.88±0.96) and DLQI (3.54±0.41) scores (Table 3.6).

Table 3.6 Duration Comparison of Study Variables

Variable	<1 Year (n=56)	1–2 Years (n=50)	2–3 Years (n=50)	3–4 Years (n=58)	4–5 Years (n=36)	Total (n=250)	p
Gender	1.52±0.50	1.74±0.44	1.48±0.50	1.43±0.50	1.58±0.50	1.54±0.50	.017*
Age	2.80±1.49	2.28±1.26	2.22±1.23	2.31±1.37	2.69±1.33	2.45±1.36	.097
Field of Study	1.80±0.71	1.70±0.74	1.72±0.64	1.93±1.09	1.50±0.65	1.59±0.69	.577
Affected Areas	1.80±0.75	1.70±0.97	1.72±1.11	1.93±1.09	1.50±0.65	1.75±0.95	.292
SD1	1.88±0.33	1.98±0.14	2.00±0.00	2.00±0.00	1.97±0.17	1.96±0.19	.001**
SD2	3.38±1.21	3.46±1.05	3.50±0.91	3.62±0.91	4.03±1.08	3.57±1.05	.045*
SD3	3.46±1.17	3.16±1.17	3.22±0.65	3.69±0.75	4.50±0.94	3.64±0.97	.037*
SD4	3.27±0.82	3.28±0.76	3.68±0.59	3.41±0.80	3.36±0.72	3.40±0.76	.000**
SD5	3.36±0.72	3.56±0.64	3.62±0.60	3.40±0.72	3.53±0.61	3.43±0.67	.040*

Variable	<1 Year (n=56)	1-2 Years (n=50)	2-3 Years (n=50)	3-4 Years (n=58)	4-5 Years (n=36)	Total (n=250)	p
DI1	3.39±0.73	3.38±0.70	3.54±0.65	3.31±0.78	3.47±0.61	3.41±0.72	.213
DI2	3.30±0.93	3.66±0.96	3.26±0.99	3.33±0.96	3.34±0.76	3.38±0.94	.538
DI3	3.43±0.95	3.72±0.76	3.68±1.04	3.28±0.87	3.47±0.93	3.54±0.97	.211
DI4	3.23±0.81	3.22±0.75	2.92±0.68	3.07±0.77	3.69±1.06	3.20±0.80	.065
DI5	3.32±0.81	3.44±0.79	3.34±0.86	3.31±0.77	3.17±0.77	3.43±0.80	.586
DQL1	3.68±1.29	3.62±1.19	3.34±1.22	3.21±1.40	3.28±1.23	3.43±1.28	.222
DQL2	3.71±1.19	3.92±0.88	3.54±1.16	3.41±1.28	3.42±1.16	3.60±1.16	.139
DQL3	3.23±1.21	3.60±1.09	3.04±1.21	3.31±1.33	3.22±1.02	3.28±1.20	.213
DQL4	3.16±1.12	3.36±1.06	2.92±1.21	2.88±1.14	3.08±1.02	3.11±1.13	.182
DQL5	3.48±1.16	3.64±1.01	3.14±1.23	3.33±1.34	3.42±0.94	3.40±1.16	.276
DQL6	3.20±1.43	3.22±1.30	3.58±1.20	3.02±1.40	2.92±1.46	3.20±1.37	.167
DQL7	3.66±1.25	3.54±1.30	3.68±1.34	3.43±1.38	3.22±1.33	3.52±1.32	.482
DQL10	3.59±0.91	3.88±0.96	3.36±0.78	3.78±0.56	3.67±0.96	3.66±0.85	.024*
Clinical Signs	3.36±0.44	3.44±0.42	3.33±0.47	3.29±0.48	3.32±0.48	3.35±0.46	.514
Disease Severity	2.40±0.22	2.46±0.19	2.46±0.19	2.42±0.38	2.39±0.29	2.43±0.26	.578
DLQI	3.45±0.37	3.54±0.41	3.60±0.38	3.43±0.44	3.33±0.51	3.48±0.42	.031*

Significant p-values: * $p < .05$ ** $p < .001$

4. Discussion

This cross-sectional study investigated the effects of seborrheic dermatitis (SD) on the daily lives of 250 university students in Sialkot, Pakistan, as well as the ways in which clinical severity and quality of life are influenced by factors such as gender, age, field of study, afflicted location, and duration of the disease. What emerged is a picture many physicians will understand but that regular practice often overlooks: the way a skin illness looks on an examination sheet and the way it feels to the person living with it are not the same thing. Severity and quality-of-life burden followed different trajectories in almost all comparisons. The discussion that follows first examines the areas in which our findings are consistent with those of previous studies before focusing on how they connect to the fundamental causes and processes that those earlier writers suggested.

In terms of patient demographics and the gendered load distribution, this study's findings are consistent with previous studies. The bulk of our sample was young, with a small female majority (54.4%) and the largest cohort (36.0%) being under-20. The same youthful, mixed-gender distribution was reported by Araya et al. (2015), who studied students in a tropical setting and discovered that SD most frequently manifested during adolescence and early adulthood. They explained this by pointing out that the disease onset coincides with the post-pubertal rise in sebaceous gland activity, arriving at precisely the life stage when appearance-related anxieties are already elevated. In a similar vein, Szepietowski et al. (2009) discovered that DLQI scores varied significantly with age, gender, and education level in their Polish cohort. They concluded that these factors were active determinants of how a patient views and

manages a visible condition rather than incidental background information.

The gender trend in our data is also well-known: despite somewhat lower clinical severity, women reported a higher quality-of-life burden than men (DQL10: 3.82 versus 3.46, $p = 0.001$). In a controlled scalp treatment trial, Bacon et al. (2014) discovered that female patients had a higher psychosocial burden than male patients. They ascribed this difference to the stronger cultural and psychological relationship between women's self-esteem, hair, and scalp attractiveness. Using a case-control design, Tumturk et al. (2025) discovered that social appearance anxiety was measurably higher in women with SD and, importantly, that it did not scale with lesion severity. Their explanation was that distress is caused by the lesions' visibility and perceived social unacceptability rather than their clinical magnitude.

Additionally, our anatomical site research yielded results that were consistent with those published in the broader literature. Participants with scalp involvement reported the highest daily interference scores (DI1: 3.70, $p < 0.001$) and the highest symptom intensity (SD5: 3.94), with the scalp being the most frequently afflicted location (49.6%). In their thorough analysis, Gupta and Bluhm (2004) discovered that of all SD presentations, scalp SD accounted for the largest percentage of functional impairment. They made two arguments: first, flaking is apparent to the public, especially when wearing dark clothing, and is sometimes mistakenly seen by onlookers as an indication of poor cleanliness; second, chronic scalp pruritus interferes with concentration in a manner that lesions on covered locations do not. According to De Avelar Breunig et al. (2012), scalp involvement was the single best predictor of avoidance behavior and social humiliation in male teenagers. They explained this finding by pointing out that it was impossible to cover the location during typical social engagement. Our findings closely align with this line: even among students living on the same campus, involvement of a visible site, like the scalp, consistently caused more disruption than involvement of hidden areas, like the chest or ears, indicating that functional impairment is driven by visibility rather than lesion count.

This study supports the accepted biological theory of why males frequently exhibit more severe illness. Clinical severity was significantly higher in male participants than in female participants (disease severity: 2.47 versus 2.39, $p = 0.026$; SD5: 3.53 versus 3.29, $p = 0.015$). Turchin et al. (2025) found the same male predominance in disease expression across their reviewed cohorts, and the reason they identified was androgen-mediated sebaceous hyperactivity: circulating androgens, which are substantially higher in males, stimulate sebum secretion and thereby enlarge the lipid substrate on which *Malassezia* depends, amplifying the inflammatory response. Our evidence correlates with this process directly. More importantly, when it is read alongside our quality-of-life results, the correlation yields a coherent explanation for the central paradox of our study: the hormonal activity that gives men more clinically active disease does not produce more suffering, because emotional burden is mediated not by sebum output but by the meaning a person attaches to their own appearance. Our findings therefore correlate with the literature in confirming that men tend to have the worse skin, while women tend to feel the worse effects of it.

The disease-duration contradiction, the most illuminating aspect of our findings, also strongly aligns with earlier research and the arguments put out by those writers. The one-to-two-year group reported the highest deterioration in quality of life (DQL10: 3.88; DLQI: 3.54, $p = 0.024$ and $p = 0.031$), despite the fact that our longest-duration individuals experienced the most severe symptoms. Sarac and Kocaturk (2022) discovered that patients' perceived stress and depressive symptoms peaked earlier rather than later in the course of their illness. Their explanation was psychological rather than dermatological: newly diagnosed patients do not yet have the coping mechanisms, disease acceptance, and habituation that longer-term patients develop, so the same physical symptoms carry a higher subjective weight. Berk and Scheinfeld (2010) discovered a similar pattern of disproportionate early distress, which they linked to a lack of information: early-stage patients often do not receive adequate counseling regarding the chronic but

manageable nature of SD, and as a result, they interpret each relapse as proof that their treatment is failing. Our results perfectly align with both narratives, showing that the early years of the illness are the most emotionally difficult time, even when the skin has not yet reached its worst. This window is crucial for psychological support, education, and assurance.

The broader evidence that the clinical and emotional peaks of SD do not coincide is consistent with our age and field-of-study findings. Participants between the ages of 20 and 24 had the highest severity (2.53, $p = 0.013$), while those under the age of 20 had the lowest severity (2.38). This gradient is consistent with Palanisamy et al.'s (2025) observation that peak clinical activity coincides with maximal androgen-driven sebum production in early adulthood. However, our cohort's quality-of-life degradation was essentially consistent across all age groups. While quality-of-life scores were similar across the three, severity also varied considerably by academic program (Allied Health Sciences 2.49, MBBS 2.47, Pharm-D 2.38, $p = 0.019$). This is consistent with the stress-mediated pathway described by Sarac and Kocaturk (2022), where academic and occupational pressure exacerbates SD through cortisol-mediated effects on sebaceous activity and immune regulation. Additionally, Peyvé and Lleónart (2007) found that occupational stress contributed to disease severity even after adjusting for age and gender, but did not by itself predict the lived impact of the condition. This is because psychosocial burden is shaped by students' shared social environment rather than the particular discipline they study.

When taken as a whole, the connections and similarities mentioned above lead to a single, coherent conclusion. The trends seen in Sialkot, such as the predominance of scalp involvement, the emotional turbulence of the early illness years, the constant gap between clinical severity and lived experience, and the greater psychosocial load in women, are not oddities that require particular explanation. They are consistent with previous research, and the explanations put out by those authors—whether androgenic, inflammatory, or psychological—explain our results just as well as they did their own. Our contribution is to validate these

patterns in a cohort of Pakistani university students that has not been extensively documented in the literature, bolstering the argument that seborrheic dermatitis should be evaluated based on the patient's experiences as well as how it manifests on their skin.

5. Conclusion

This study reveals that Seborrheic dermatitis places a significant and complex burden on university students in Sialkot, Pakistan, extending beyond just visible skin symptoms. Key findings show that males suffer from more severe clinical symptoms, while females face greater psychosocial challenges. Scalp involvement is the strongest predictor of functional impairment, disease severity peaks between ages 20 and 24, and quality-of-life impact is surprisingly highest in the early stages of the condition. These results highlight that clinical assessments alone do not fully capture the patient's experience. In students, Seborrheic dermatitis intersects with academic stress, social image concerns, and emotional wellbeing in ways traditional severity scales miss. Therefore, using validated quality-of-life measures like the DLQI in routine evaluations is essential—especially for female students, those with scalp symptoms, and newly diagnosed individuals who are more prone to psychological distress. Effective treatment should combine antifungal and anti-inflammatory medications with patient education, stress management support, and timely mental health referrals when DLQI scores show significant impact. This study adds important evidence from Pakistan to the global understanding of Seborrheic dermatitis burden and underscores the need to treat the whole student, not just the skin.

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