

Using Skindex-29 Scale to Assess The Impact of Androgenetic/Patterned Hair Loss on Quality of Life of Patients in Pakistan

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ABSTRACT

Objective: to assess the impact of androgenetic alopecia (AGA)/female patterned hair loss (FPHL) on the quality of life of Pakistani patients using Skindex-29 scale.

Study Design: Cross-sectional study.

Place and Duration of Study: Outpatient Department of Dermatology, Combined Military Hospital, Lahore Pakistan, from Oct 2020 to Mar 2021.

Methodology: Three hundred patients (150 males and 150 females) having androgenetic alopecia (AGA)/female patterned hair loss (FPHL) were selected by consecutive sampling. Skindex-19 questionnaire was used to assess the impact of alopecia on their quality of life.

Results: Mean age of study participants was 41.6 ± 12.4 years (range: 18-72 years). Maximum patients (40.7%) had grade-1 severity of alopecia. Most of the patients (37.3%) had disease duration of 1-5 years. Mean global score, symptoms scale score, emotion scale score and function scale score were 31.3 ± 14.8 , 22 ± 22.56 , 41.67 ± 28.1 and 30 ± 26.5 respectively. Gender and disease duration were statistically significant ($p=0.001$ and $p=0.013$ respectively).

Conclusion: Skindex-29 can be successfully used in our setup for quality of life studies in AGA/FPHL patients. Females were more severely affected than males as per global scores on Skindex-29.

Keywords: Androgenetic alopecia, Hair specific skindex-29, Quality of life.

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INTRODUCTION

World Health Organization defines the quality of life (QOL) as “the individuals’ perception of their position in life, in the context of the cultural and value system in which they live and concerning their goals, expectations, standards and concerns.” Health-related QOL (HRQOL) includes physical, psychological, and social health factors.¹ A QOL scale used in dermatology is Skindex-29 scale, which was initially developed by Chren *et al.*² This questionnaire covered three dimensions. That includes symptoms (7 items), functional impact (12 items) and effect on emotions (10 items). This scale was modified for the patients with alopecia by replacing the words ‘skin’ and ‘skin condition’ in the original Skindex-29 with ‘scalp’ or ‘alopecia,’ respectively and was renamed as the Hair Specific Skindex-29.³

Androgenetic alopecia (AGA) is considered the most common type of baldness that affects roughly 50% of men and perhaps as many women older than

40 years of age.⁴ Prevalence is highest in the Caucasians. In a Chinese study, the overall prevalence of androgenetic alopecia was 21.3%, while the overall prevalence was 14.1% in a Korean study.⁵ An epidemiological study on AGA women showed the prevalence of around 19% in 1006 Caucasian patients. According to one study, 13% of premenopausal women reportedly have some evidence of androgenetic alopecia and the incidence increases in women following menopause.⁶

AGA significantly affects the affected individuals’ quality of life in both genders. Longer duration and increasing age of patients are related to more psychosocial distress.^{7,8}

This study aimed to use hair-specific Skindex-29 in our cultural context to determine the impact on QOL of AGA/FPHL. No local studies have been done using this instrument in alopecia before. This research will help our dermatologist effectively use this instrument to monitor and address the QOL in such patients.

METHODOLOGY

It was a cross-sectional study, conducted at the Outpatient Department of Dermatology in Combined

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Military Hospital Lahore, from October 2020 to March 2021. Institutional Ethics Review Board permission was taken from CMH Lahore (Ref. no.238/2020 of IRC/ERB certificate dated 9/9/20).

Inclusion Criteria: Patients of both genders having androgenetic alopecia (AGA)/ female patterned hair loss (FPHL) were include in the study.

Exclusion Criteria: Patients who were already under treatment for psychiatric disorders or suffering from other skin diseases effecting the scalp like psoriasis were excluded from the study. Patients taking treatment for their alopecia in the past 3 months were also excluded from the study.

Hair-specific Skindex-29 was used, which was modified from the original Skindex-29 devised by Dr. Marry Margaret Chren.^{2,3} Dr. Chren was e-mailed for permission to re-use this tool in our settings. She referred us to MAPI Research trust for approval, where we submitted our request for the English version of questionnaires with ID No. 30081 and received the required permission.

Since we were validating a questionnaire, rules-of-thumb vary from 4-10 subjects per variable, with the minimum number of 100 subjects to ensure stability of the variance-covariance matrix.⁹

We gave this questionnaire to 150 male and 150 female patients suffering from androgenetic alopecia and female patterned hair loss, respectively. Patients were selected by consecutive sampling technique based on the diagnosis confirmed by a dermatologist in our Out-Patient Department. Patients were included in the study after the informed consent.

The psychometric validation of the “hair specific” Skindex-29 (English version) questionnaire was carried out based on face validity, reliability (Cronbach α), and test-retest validity. Word “skin” was replaced with “scalp” and “skin condition” by “alopecia”, following the disease we were studying, previously done by Han *et al.*³ This Questionnaire had 29 questions related to symptoms, emotions and functional impact of alopecia. A panel of 5 dermatologists from different Pakistani hospitals were included for establishing face validity. Test-retest validity was carried out to ensure the reproducibility and reliability of the questionnaire by making 10 patients refill it one week after filling it in the first instance. Those 10 responses were used to calculate the initial Cronbach alpha, which came out 0.92, showing good internal consistency.

A dermatology resident briefed the patients about the questionnaire. Patients answered each question with a number ranging from 0-5. Answer to each item was transferred to a linear scale ranging from never=0, rarely=25, sometimes=50, often=75 and all the time=100. A score of ≥ 44 points was considered the severe impact on QOL as interpreted by Prinsen *et al*, in a study.⁷ Disease duration was categorized as less than 1 year, 1-5 years, 5-10 years and more than 10 years. Trainee dermatology checked disease severity and graded based on the Sinclair scale for FPHL and Hamilton-Norwood’s ranking for AGA. Hamilton-Norwood scale includes grades 1-7.⁸

Statistical Package for Social Sciences (SPSS) version 21 was used for the data analysis. Reliability was be checked by Cronbach alpha. Exploratory factor analysis was done to re-check the domains covered by the questionnaire. Descriptive analysis was used for socio-demographics. The relationship of independent variables like gender, marital status, disease duration, and disease severity was analyzed and compared with the Global scores, emotion scale, function scale, and symptom scale score. Independent t-test, one way and two-way ANOVA and Spearman and Pearson correlation coefficient were used for this purpose, respectively.

RESULTS

Total 300 patients completed the questionnaire. There were 150 (50%) males and 150 (50%) females in the study. Minimum age of participants was 18 years and the maximum age was 72 years, with the mean age 41.6 ± 12.4 years. Mean global score was 31.31 ± 14.9 (Range: 0.69-72.42). Mean scores in symptoms, emotions and function scales were 22 ± 22.6 , 41.6 ± 28.12 and 30.19 ± 26.569 , respectively.

About 184 patients were married, 90 (30%) were unmarried, 10 (3.3%) were divorced and 16 (5.3%) patients were widowed. Regarding severity, 122 (40.7%) patients had grade-1, 80 (26.7%) had grade-2, 46 (15.3%) had grade-3, 35 (11.7%) had grade-4, 9 (3%) patients had grade-5, 6 (2%) patients had grade-6 and 2 (0.7%) patients had grade-7 alopecia. 84 (28%) patients had disease duration of less than 1 year, 112 (37.3%) had 1-5 years, 68 (22.7%) had disease duration of 5-10 years, 36 (12%) had the disease duration more than 10 years.

Reliability analysis of the questionnaire showed Cronbach alpha of 0.914. Cronbach alpha for questions related to three separate domains i.e., symptoms,

emotions and functions, were 0.98, 0.99 and 0.97, respectively.

Exploratory factor analysis was done by principal component analysis. The scree plot showed Eigen values of more than 1 for three components (Figure).

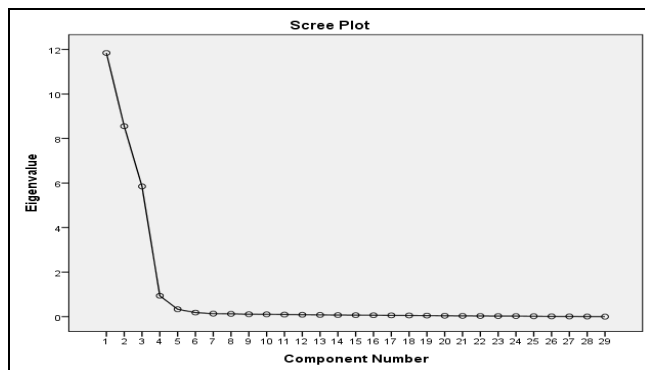


Figure: Scree plot for principal component analysis of exploratory factor analysis.

Varimax rotation with Keiser Normalization converged after 4 iterations yielded three domains consistent with the original domains of emotions, symptoms and functions. Independent sample t-test for gender with score of Skidex-29 showed significant relation of global score, scores in symptom and function scale with gender (Table-I).

Table-I: Comparison of scores of skindex-29 in both genders.

Score	Study Groups (Mean ± SD)		p-value
	Male (n=150)	Female (n=150)	
Symptoms	14.6 ± 17.8	29.5 ± 24.3	0.0001
Emotions	38.5 ± 2.6	44.8 ± 1.91	0.05
Functions	26.95 ± 26	33.4 ± 26.8	0.035
Global	26.69 ± 14.2	35.93 ± 14.1	0.0001

One-way ANOVA for disease duration and global scores showed variance between groups with the p-value of 0.013 (Welch test 0.022 and Brown-Forsythe

test 0.013). For symptom scale and emotion, the variance between groups showed the significance of 0.007 and 0.031, respectively. However, for the function scale, there was a non-significant group variance of 0.885. This showed that QOL was affected with prolonged disease duration and more so in emotions and symptoms domains.

ANOVA for marital status with global Skindex score showed the significance of 0.324 between groups (Welch 0.311 and Brown-Forsythe 0.275). Mean global scores were maximum for married. Significance between groups was 0.027 for symptom scale, 0.021 for emotion scale and 0.393 for function scale, respectively. This showed a significant relationship between marital status and symptom and emotion scale but not for Global and Function scale. For the emotion scale, more score was observed for unmarried and for the symptom scale, more score was observed for widowed.

Two-way ANOVA was used to estimate how the global score changed with the gender and disease severity. As the results were not statistically significant, a post hoc test was not applied. Significance of 0.120 showed equal error variance across groups. The p-value for gender was 0.001 and for severity 0.393. The p-value for the interaction between gender and severity was 0.006. There were significant p-values for the interaction between gender and severity in the case of global scores, symptom and emotion scale as shown in Table-II & III.

Pearson correlation for age with the global skindex-29 score was 0.051 with an insignificant p-value of 0.375. While Pearson correlation of age with symptom scale was 0.170 with the significant p-value of 0.003. Pearson correlation of age with emotion scale was -0.225 (p-value of 0.001). Pearson correlation of age with function scale was 0.18 (p-value 0.002) as shown in the Table-IV.

Table-II: Results of 2-way ANOVA comparing disease severity in both genders with scores.

Parameters	Severity	Global Score	Symptom Scale	Emotion Scale	Function Scale
Group 1 Male (n=150)	1 (n=19)	34.27 ± 12.4	16.5 ± 20	50.5 ± 32.6	35.7 ± 27
	2 (n=45)	31.7 ± 14.2	16.5 ± 19.7	45.3 ± 30.7	33.3 ± 25
	3 (n=38)	20.9 ± 12.6	12.3 ± 11	33 ± 32.4	17.3 ± 22
	4 (n=31)	25.06 ± 14.5	11.6 ± 16	42.5 ± 30.8	20.9 ± 27
	5 (n=9)	22.17 ± 8.7	9.5 ± 18	11 ± 19.8	45.6 ± 21.6
	6 (n=6)	17.9 ± 15.8	28.6 ± 27	10 ± 13.4	14.9 ± 2.6
	7 (n=2)	22.4 ± 14.2	25 ± 35	16 ± 15.9	26 ± 27.9
Group 2 Female (n=150)	1 (n=103)	34.6 ± 13.0	28.7 ± 24	43.8 ± 24	31 ± 26.9
	2 (n=35)	38 ± 15.2	27.8 ± 22.5	47.5 ± 21	38.7 ± 27.3
	3 (n=8)	43.6 ± 20.8	50 ± 30	48.4 ± 22	32.5 ± 28.8
	4 (n=4)	35.5 ± 14	25 ± 20	38 ± 31.9	44 ± 5.2
	5 (n=0)	-	-	-	-

Table-III: Linearly independent pairwise comparison among the estimated marginal means.

Group Comparison	Disease Severity <i>p</i> -value	Gender <i>p</i> -value
Function-Scale	0.187	0.101
Emotion-Scale	0.000	0.012
Symptom-Scale	0.188	0.000
Global Scale	0.012	0.000

Table VI: Pearson correlation significance of age with scores of skindex-29.

	Pearson Correlation	<i>p</i> -value
Function-Scale	0.180	0.002
Emotion-Scale	-0.225	0.000
Symptom-Scale	0.170	0.003
Global-Score	0.051	0.375

DISCUSSION

Previous studies carried out in different settings have used various instruments to assess the impact of AGA on QOL.^{9,10} Gonul *et al*, used 9 the Hairdex scale and QTL in their study. Hairdex scale has QOL questions pertaining to 5 domains, i.e., symptoms, function, emotions, stigmatization and self-confidence. QTL also contains 11 questions related to these domains as well as social and sexual effects and cognition. A study in Australia utilized WAA-QOL (Women’s AGA Quality of Life Questionnaire) to assess the psychosocial impact of disease in female patients.^{11,12} We have used the Skindex-29 scale in our study for this purpose. It is a 29-item generic scale covering 3 domains of emotions, functions and symptoms developed by Chren *et al*,² It has been used worldwide to assess the QOL issues related to various skin diseases like skin ulcers, eczema, psoriasis, mycosis fungoides, etc.¹³⁻¹⁵ It has been translated into different languages.¹⁶⁻¹⁹ We used hair-specific form, which was developed by Han *et al*.³

Our mean global score of skindex-29 was 31.31 ± 14.8, which was more than a study carried out in Korea (27.3 ± 19.1).³ Our study showed that AGA severely affects the QOL of affected patients, especially in the emotional domain. 19% of our patients had a global Skindex-29 score of ≥44, which is the cut-off score for severely affected individuals. Prinsen *et al*, in their study, have established cut-off scores for severely impaired health-related quality of life, ≥52 for symptoms, ≥39 for emotions and ≥37 for functioning.⁷ In our study, 57% patients had the scores of ≥39 for emotions, 44% had scores of ≥37 for functioning and 7% had scores of ≥52 for symptoms.

In our study, disease duration was less than one year was in 84 (28%) patients, 1-5 years in 112 (37.3%) patients, 5-10 years in 68 (22.7%), >10 years in 36 (12%) patients. Results were comparable to a Korean study which showed 26.5% had a disease duration of less than 1 year, 43.3% had 1-5 years and 30.2% patients had the disease duration of >5 years.²⁰

We categorized the severity of AGA in our male patients by using Norwood’s classification and Sinclair’s classification for females. In other studies, patients were classified as suffering from mild or severe disease based on the BSAP scale.^{21,22} About 60.1% had mild disease and 39.9% had severe diseases. Ludwig’s classification was used for females and Hamilton’s classification for male patients in a Turkish study.²³

EFA done in our study yielded three principal components of the questionnaire i.e., emotion, symptom and function. This was consistent with the findings of Chren *et al*, who initially made and then checked the psychometric properties of Skindex-29.²

Our study showed a significant effect of gender (*p*=0.0001) on global scores, symptom scale (*p*=0.0001), emotion scale (*p*=0.05), function scale (*p*=0.035), which were more in females than in males. Another study in Riyadh showed comparable results i.e., more scores in females using DLQI (Dermatology life quality index) and more willing to pay for the treatment.²⁴ Similarly, in a Spanish study, for women with alopecia highest scores were observed in the emotional domain.²⁵ This showed that women are more affected emotionally and have impaired quality of life because of FPHL as compared to men.

In a study by Guerra Tapia *et al*, scores increased with the grade of alopecia, especially in the emotion domain and were maximum in Sinclair grade II.²⁵ Our results showed no significant effect of the grade of AGA on Skindex scores. Similarly, age with global scores had a positive correlation with symptom and function scale and negative correlation with emotion scale (*p*>0.05).

Skindex-29 (Hair-specific) in English is a reliable tool to assess the impact of AGA/FPHL on QOL in our population. AGA/FPHL significantly effects the QOL in females more than males and people with longer disease duration.

CONCLUSION

Skindex-29 can be successfully used in our setup for quality of life studies in AGA/FPHL patients. Females were more severely affected than males as per global scores on Skindex-29

Conflict of Interest: None.

Authors' Contribution

SSM: Overall drict contribution, TN: Data collection, SN: Collection of Data, IJM: Collection of Data, BMK: Collection of Data, SS: Helped in analysis of data.

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