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Relationship of Hair Loss and Anxiety among Male and Female in Polyclinic at King Faisal University

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Abstract— Introduction: Telogen effluvium is a temporary form of excessive hair shedding, and it can occur due to a variety of physical or mental stressors. Data on the epidemiology of telogen effluvium are limited, and its true incidence is mostly unknown. This study aimed to observe the relationship between hair loss and anxiety among male and female in Poly Clinic at King Faisal University, Saudi Arabia. **Methods and Material:** This is a cross-sectional study conducted in Polyclinic at King Faisal University.A well-structured questionnaire was distributed among males and females. **Results**: The prevalence of hair loss associated with anxiety was 21.7% (n=82). The most frequently mentioned reason for hair loss was lack of vitamins (26.2%), followed by psychosocial disorder (18%). In univariate analysis, nationality, history of the stressful event, having recurrent, irresistible urges to pull out hair from the scalp and taking medication were all significantly influenced hair loss associated with anxiety. In the multivariate regression model, history of the stressful event, used of Minoxidil hair spray and those who seek treatment for anxiety were the significant independent factors associated with anxiety. **Conclusions**: Hair loss associated with anxiety were minimal. Stress used Minoxidil spray and seeking treatment for anxiety likely to be the reason for hair loss associated with anxiety. Meanwhile, lack of vitamins, psychosocial factors and hereditary influence branded as the reason for hair loss.

Keywords: Hair loss, Anxiety, stress, psychological disorder, polyclinic.

Key Messages: The lack of vitamins, psychosocial variables and genetic consequences are branded as the cause of hair loss

Introduction:

Shedding of hair is termed effluvium, and the resulting condition is called alopecia (baldness). Telogen effluvium (nonscarring alopecia) is the transiently increased shedding of normal club (telogen) hairs from resting scalp follicles. It is a pattern of hair loss due to a variety of physical or mental stressors, such as systemic diseases, medications, nutritional deficiencies, rapid weight loss, intoxication, major surgery and psychological stress including anxiety, depression and bipolar disorder. Telogen effluvium usually occurs after an inciting event occurred by 3 to 4 months. Hair loss occurs diffusely throughout the scalp without scarring or inflammation signs [1]. It is common in dermatology clinics to have patients complaining about hair loss [2]. In telogen effluvium (TE) patient complains of unexpected onset of hair loss, which is fast, widespread, generalized shedding of hair. Around one hundred to one thousand hairs per day might be lost [3].

There are two types of telogen effluvium (TE), acute and chronic. We can call it chronic if it is excessed six-month duration. An ideal example of the acute type is post-partum (TE). However, in autoimmune (TE), it is a chronic type with a sporadic event of improvement [4]. In Acute (TE) it can consider the case self-limited case

if the triggering factor known and solved. According to the patient scenario, management options includes patient education, correcting deficiencies, minoxidil and Finasteride available FDA-approved, topical corticosteroids, systemic corticosteroids [5]. Alopecia areata is the most prevalent autoimmune disorder and the second most prevalent hair loss disorder after androgenetic alopecia. It is associated with psychiatric and medical comorbidities, including depression, anxiety, and several autoimmune disorders, and an increased global burden of disease. There is a high prevalence of anxiety and depressive symptoms in AA patients. Dermatologists should know the psychological impact of AA because the treatments have limited effectiveness. AA prevalence in Saudi Arabia is higher than in Western countries. It affected males more than females. Also, there was worse prognosis in male gender and young age. Oxidative stress, anxiety, and depression scores were higher in patients with AA compared to normal controls. Also, anxiety and depression scores were not associated with oxidative stress in alopecia areata patients [6]. A recent study by Alexandra C Villasante Fricke et al. found that the Alopecia areata is the most prevalent autoimmune disorder and the second most prevalent hair loss disorder after androgenetic alopecia. It is associated with psychiatric and medical comorbidities, including depression, anxiety, and several autoimmune disorders, and an increased global burden of disease [7]. Another study by Rim Sellami et al. found that there is a high prevalence of anxiety and depressive symptoms in AA patients. Dermatologists should know the psychological impact of AA because the treatments have limited effectiveness [8].

In contrast, another study of Abdulmajed Al-ajlan et al. found that the AA prevalence in Saudi Arabia is higher than in Western countries. It affected males more than females. Also, there was worse prognosis in the male gender and young age [9]. On the other hand, the study of Gokhan Cakirca et al., the Oxidative stress, anxiety, and depression scores were higher in patients with AA compared to normal controls. Also, anxiety and depression scores were not associated with oxidative stress in alopecia aerate patients [10].

Subjects and Methods:

Descriptive statistics were performed using counts and proportion (%). Between comparison, Chi-square had been applied. Multivariate regression analysis had also been conducted to determine the significant independent predictor associated with anxiety. P-value <0.05 was considered statistically significant. Data were collected in an excel sheet before being interpreted on a Likert scale for statistical analysis. All data analyses were carried out using Statistical Packages for Software Sciences (SPSS) version 21 Armonk, New York, IBM Corporation. The sample size will be statistically calculated with a confidence level of 95% and a margin of error of 5%. Therefore, the evaluated sample size is 378 participants. The ethical issues were approved by the College of Medicine committee; King Faisal University before the start of the study. Participants were assured about the confidentiality and the purpose of using the obtained data.

Questionnaire:

The questionnaire was distributed among males and females at the King Faisal University polyclinic using online platform consisting of ages groups were divided to within intervals of 5 years, starting from the age of 18

and older than 40 years to demonstrate the relationship between different age groups. Also, the questionnaire included gender, nationality, place of residence, smoking, educational level and marital status. Moreover, it included hair characteristics (type and duration of hair loss) if there is a family history of hair loss and if any of these conditions before or during hair loss (pregnancy, childbirth, menopause, thyroid disease, Androgenic alopecia, Alopecia areata, DM, Iron deficiency anaemia, Mineral deficiency, Renal disease, Liver disease, Infection, Hormonal imbalance, Malignant disease) and if taking drugs for (cancer, arthritis, gout, hypertension, depression, heart condition) before hair loss. It also included questions regarding psychological view such as the history of stressful events, anxiety and if treated or not, loss of weight during anxiety and if the loss of hair has occurred during weight loss additionally if there is irresistible urge to pull out hair from the scalp, and doing excessive hairstyling or hair treatment at salon and usage of Minoxidil hair spray.

Results:

We recruited 378 participants in Polyclinic at King Faisal University, Saudi Arabia, to evaluate the relationship of hair loss with anxiety. As described in table *1*, the most common age group was more than 40 years old (36.5%) with nearly all were Saudis (98.7%). Concerning their educational attainment, the majority of them were bachelor degree (67.2%) with nearly two-thirds (65.3%) were married. Additionally, the prevalence of smoker was 3.4%. When comparing the socio-demographic characteristics of participants by gender, it was found that age group, marital status and smoking showed a significant relationship with gender (All $p<0.001$).

Table *2* presented the characteristics of hair, mental disorder and its relationship to gender. Following the results, it was found that more than half (54.2%) of the study subjects had normal hair. About a quarter of them (24.9%) were suffering from hair loss in less than six months. We also observed 31.2% who had a history of a stressful event. Of those who had a previous history of stress, 34.7% of them happened from the last year.

Similarly, there were 52.4% who had been suffering from anxiety for the last five years. Of those who had a previous history of anxiety, only 5.6% had undergone anxiety treatment. Likewise, one fourth (25.1%) of the respondents suffered hair loss due to weight loss. The proportion of respondents who had recurrent, irresistible urges to pull out hair, those who were using Minoxidil hair spray, those with a family history of hair loss, those with excessive hairstyling or hair treatment at the salon, those with the associated condition that might cause hair loss and those who were taking medication before hair loss were; 14%, 9.8%, 73.3%, 23.8%, 45.5% and 10.6%, respectively. In comparison to gender, type of hair ($p=0.019$), hair loss due to weight loss ($p=0.018$) and associated condition that might cause hair loss ($p<0.001$) were all statistically significant when compared to gender.

Figure *1* depicted the reason for hair loss; it was revealed that the most commonly known reason was lack of vitamins (26.2%), followed by psychosocial disorder (18%) and hereditary (10.3%). In comparison, the least of them was pregnancy and breastfeeding (3.2%). In table *2*, it showed the relationship between anxiety and the socio-demographic characteristics of the respondents. Based on the results, it was found that nationality significantly influenced anxiety ($X2=4.377$; $p=0.036$) while age group, gender, educational level, marital status and smoking did not show a significant relationship with anxiety (All $p>0.05$).

In table *4*, it presented the relationship between anxiety and hair loss. It was observed that hair loss associated with anxiety has a significant relationship with the history of a stressful event (X2=27.303; p<0.001), undergone anxiety treatment (X2=70.799; p<0.001), used of Minoxidil hair spray (X2=21.238; p<0.001) and taking medication (X2=14.305; p<0.001). On the other hand, type of hair, duration of suffering from hair loss, hair loss due to weight loss, having recurrent, irresistible urges to pull out hair from the scalp, family history of hair loss, excessive hairstyling and associated condition that might cause hair loss were not statistically significant when compared to anxiety (All p>0.05).

In table *5* when conducting multivariate regression model to determine the significant independent predictor associated with anxiety, it was found that participants with a history of the stressful event were 3.287 times more likely to be more associated with anxiety (AOR=3.287; 95% CI=1.836 - 5.885; p<0.001). Participants who were using Minoxidil hair spray were 4.276 times higher to be more associated with anxiety (AOR=1.954 - 9.357; p<0.001) while those patients who seek treatment for anxiety were 104.2 times more likely to be more associated with anxiety (AOR=104.2; 95% CI=10.54 - 1030.2; p<0.001). In contrast, nationality (AOR=1.735; CI=0.109 - 27.678; p=0.696) and taking medication for cancer, arthritis, gout, HTN, depression or heart condition (AOR=1.714; 95% CI=0.683 - 4.301; p=0.251) were not statistically significant to anxiety after adjusting to regression model.

Discussion:

The purpose of the present study is to examine the relationship between anxiety and hair loss among males and females. Hair loss such as Alopecia areata (AA) believed to b0e the cause in some psychosocial disorders including anxiety, depression and stress, and have been the subject of many discussions among literature [11-16]. The findings of this study showed that the prevalence of anxiety associated with hair loss was 21.7%. Psychosocial diagnoses, including anxiety among patients with (AA), had been reported in many cases varying from 13.7% to 63% [17-22]. The prevalence of anxiety associated with hair loss in our paper was consistent from the paper of AlShahwan, [17] Based on his findings, the prevalence of anxiety associated with hair loss was 29%.

Compared to the general population, patients with hair loss exhibited more of suffering from a psychological disorder, including anxiety. Up to this date, the etiological role of mental disorder to hair loss have not been well validated. However, it has been suggested that anxiety was one of the comorbid mental disorders [18]. This scenario was confirmed by Sadock et al. [23] They reported that, while the role of stressful events in the beginning and exacerbation of AA is vague, still comorbid mental disorders may have still existed. In our study, 31.2% of the patients reported with the previous history of stressful events and had been one of the significant independent predictors of anxiety, suggesting that patients who had the previous history of stressful events were positively influenced hair loss associated with anxiety. This report is in accordance than that of Shaikh et al. [24] They indicated that nearly two-thirds (65.8%) of the respondents exhibited moderate stress due to hair loss, 18.3% had high stress, and 15.8% had low stress. They further concluded that stress showed a strong relationship with hair loss.

In a study by Baghestani et al. [18], females exhibited a higher prevalence of having anxiety than males. This finding is not valid in our study, as the difference in anxiety between males and females were not statistically significant. Baghestani et al. [18] also pointed out that there was a significant difference between the

educational level and anxiety which was confirmed Firooz et al. [25]. However, this has not been the case in our study, as we found that the difference between the level of education and anxiety were not significantly different across the groups.

Moreover, in our study, multivariate estimates indicated that the history of a stressful event, used of Minoxidil hair spray, and seek treatment for anxiety were the factors independently associated with anxiety. There were limited papers in Saudi Arabia that examine the different factors associated with anxiety among patients with hair loss. Besides, in our study, age was not a factor of anxiety. This matched the report of Baghestani et al. [18] where they found that there was no significant difference with respect to patients' age. However, Chu et al. [26] documented that age was a significant factor of anxiety among AA patients which contradicted our results.

In a study reported in the United Kingdom [22], wearing a wig decreased the level of anxiety and social anxiety among patients with AA. They argued that AA patients who worry about not wearing a wig indicated significantly higher levels of anxiety and social anxiety. In our study, excessive hair styling did not show significant difference with anxiety which was not consistent from the previous reports.

Data in this study further revealed that the relationship between the duration of the disease and anxiety were not statistically significant. This finding is similarly reported in the study published in Iran [18], where they documented that there was no significant relationship observed between psychological disorders and the duration of the disease. On the other hand, Firooz et al. [25] noted opposing view, showing that the increased in patient's concerns was associated with the increased of the duration of the disease.

The study reported in Pakistan [24], noted that males demonstrated more hair loss than females because of steroid hormones. They were explaining that the discharge of higher amounts of steroid hormones in stress had the potential role of excessive hair loss in a stressed population. In our study, we found that males had significantly more of having hair loss in the following groups including; younger age group (18 - 25 years), single, smokers, those with normal hair while females showed more hair loss on the following occasions such as; weight loss, and those with associated conditions. Furthermore, it can be noted that lack of vitamins, psychosocial disorders and hereditary factor were the most commonly known reason for hair loss.

Conclusion:

Hair loss associated with anxiety were minimal. Stressful events, used of Minoxidil spray and seeking treatment for anxiety likely be the reason for hair loss associated anxiety. Meanwhile, lack of vitamins, psychosocial factors and hereditary influence branded as the reason for hair loss. It is essential to examine anxiety associated with hair loss among patients. Early diagnosis of anxiety drastically decreases further complications. More researches are needed in order to validate the relationship between hair loss and anxiety.

Our study was restricted to the population of King Faisal University polyclinic patients in AlAhsa region; thus, our conclusion cannot be extended to other healthcare centres or other regions of Saudi Arabia or other countries. Certain obstacles were encountered, such as the difficulty in obtaining information from the patients in the polyclinic. Also, few participants contributed because of the limitation of patients at the King Faisal University polyclinic.

There are not enough studies that aim to explore the relationship between hair loss and the psychological condition; anxiety disorder in the eastern region of Saudi Arabia. Finding links of hair loss in psychological or organic disorders is a step forward to manage it and provide a solution. To have a more particular view for this study, it should involve other trials with more numbers of participants, as well-conducted it in a bigger region, such as the eastern region of Saudi Arabia.

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Table 1: Socio Demographic Characteristics according to gender

Study Variables	**Overall** **N (%)** **(n=378)**	**Male** **N (%)** **(n=51)**	**Female** **N (%)** **(n=327)**	**P-value** [§]
Age group				
• 18 – 25 years	103 (27.2%)	27 (52.9%)	76 (23.2%)	
• 26 – 30 years	56 (14.8%)	11 (21.6%)	45 (13.8%)	
• 31 – 35 years	36 (09.5%)	04 (07.8%)	32 (09.8%)	**<0.001 ****
• 36 – 40 years	45 (11.9%)	0	45 (13.8%)	
• >40 years	138 (36.5%)	09 (17.6%)	129 (39.4%)	
Nationality				
• Saudi	373 (98.7%)	50 (98.0%)	323 (98.8%)	0.668
• Non-Saudi	05 (01.3%)	01 (02.0%)	04 (01.2%)	
Educational level				
• Primary	07 (01.9%)	0	07 (02.1%)	
• Secondary	13 (03.4%)	0	13 (04.0%)	0.101
• High school	80 (21.2%)	08 (15.7%)	72 (22.0%)	

• Bachelor	254 (67.2%)	42 (82.4%)	212 (64.8%)	
• Postgraduate	24 (06.3%)	01 (02.0%)	23 (07.0%)	
Marital status				
• Single	131 (34.7%)	37 (72.5%)	94 (28.7%)	**<0.001 ****
• Married	247 (65.3%)	14 (27.5%)	233 (71.3%)	
Smoking				
• Yes	13 (03.4%)	13 (25.5%)	0	**<0.001 ****
• No	365 (96.6%)	38 (74.5%)	327 (100%)	

§ P-value has been calculated using Chi-square test.

** Significant at p<0.05 level.

Table 2: Mental disorder and hair characteristics of participants according to gender

Study Variables	**Overall N (%) (n=378)**	**Male N (%) (n=51)**	**Female N (%) (n=327)**	**P-value §**
Type of hair				
• Dry	102 (27.0%)	06 (11.8%)	96 (29.4%)	
• Oily	71 (18.8%)	14 (27.5%)	57 (17.4%)	**0.019 ****
• Normal	205 (54.2%)	31 (60.8%)	174 (53.2%)	
Duration of suffering from hair loss				
• <6 months	94 (24.9%)	17 (33.3%)	77 (23.5%)	0.133
• >6 months	284 (75.1%)	34 (66.7%)	250 (76.5%)	
History of stressful event				
• Yes	118 (31.2%)	12 (23.5%)	106 (32.4%)	0.203
• No	260 (68.8%)	39 (76.5%)	221 (67.6%)	
Time of stressful event (n=118)				

• <1 years	17 (14.4%)	01 (08.3%)	16 (15.1%)	
• >1 year	41 (34.7%)	05 (41.7%)	36 (34.0%)	0.768
• Uncertain	60 (50.8%)	06 (50.0%)	54 (50.9%)	
Time of anxiety event (n=82)				
• ≤5 years	19 (23.2%)	04 (36.4%)	21 (29.6%)	
• >5 years	43 (52.4%)	05 (45.5%)	38 (53.5%)	0.873
• Uncertain	14 (17.1%)	02 (18.2%)	12 (16.9%)	
Undergone anxiety treatment				
• Yes	21 (05.6%)	04 (07.8%)	17 (05.2%)	0.443
• No	357 (94.4%)	47 (92.2%)	310 (94.8%)	
Hair loss due to weight loss				
• Yes	95 (25.1%)	06 (11.8%)	89 (27.2%)	**0.018 ** **
• No	283 (74.9%)	45 (88.2%)	238 (72.8%)	
Losing weight due to anxiety				
• Yes	42 (11.1%)	08 (15.7%)	34 (10.4%)	0.264
• No/I don’t know	167 (44.2%)	43 (84.3%)	293 (89.6%)	
Recurrent irresistible urges to pull out hair				
• Yes	53 (14.0%)	09 (17.6%)	44 (13.5%)	0.423
• No	325 (86.0%)	42 (82.4%)	283 (86.5%)	
Used of Minoxidil hair spray (hair grow)				
• Yes	37 (09.8%)	08 (15.7%)	29 (08.9%)	0.128
• No	341 (90.2%)	43 (84.3%)	298 (91.1%)	
Family history of hair loss				
• Yes	277 (73.3%)	36 (70.6%)	241 (73.7%)	0.640
• No	101 (26.7%)	15 (29.4%)	86 (26.3%)	
Excessive hair styling or hair treatment at salon				
• Yes	90 (23.8%)	09 (17.6%)	81 (24.8%)	0.267

• No	288 (76.2%)	42 (82.4%)	246 (75.2%)	
Associated condition that might cause hair loss***				
• Yes	172 (45.5%)	08 (15.7%)	164 (50.2%)	**<0.001 ** **
• No	206 (54.5%)	43 (84.3%)	163 (49.8%)	
Taking medication for cancer, arthritis, gout, HTN depression or heart problems before hair loss before hair loss				
• Yes	40 (10.6%)	03 (05.9%)	37 (11.3%)	0.241
• No	338 (89.4%)	48 (94.1%)	290 (88.7%)	

§ P-value has been calculated using Chi-square test.

** Significant at p<0.05 level.

*** pregnancy, childbirth, menopause, thyroid disease, Androgenic Alopecia, Alopecia Areata, DM, Iron deficiency anemia, Mineral deficiency, Renal disease, Liver disease, Infection, Hormonal imbalance, Malignant disease

Figure 1: Reason for hair loss

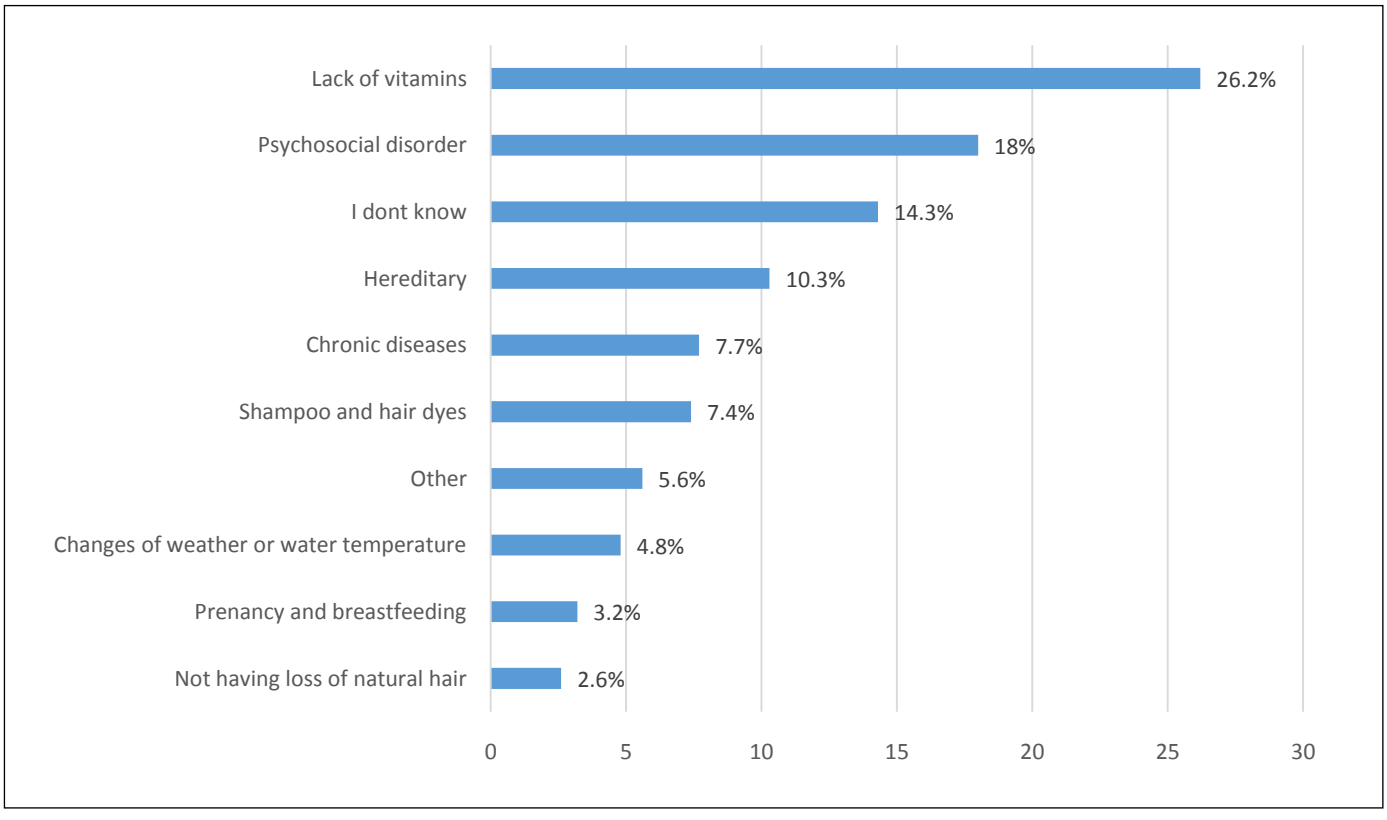

Table 3: Relationship between anxiety and the socio demographic characteristics of patients with hair loss (n=378)

Factor	Anxiety		X2	P-value §
	Yes N (%) (n=82)	No N (%) (n=296)		
Age group				
• ≤35 years	42 (51.2%)	153 (51.7%)	0.006	0.940
• >35 years	40 (48.8%)	143 (48.3%)		
Gender				
• Male	11 (13.4%)	40 (13.5%)	0.001	0.981
• Female	71 (86.6%)	256 (86.5%)		
Nationality				
• Saudi	79 (96.3%)	294 (99.3%)	4.377	**0.036 ** **
• Non-Saudi	03 (03.7%)	02 (0.70%)		
Educational level				
• High school or below	25 (30.5%)	75 (25.3%)	0.875	0.349
• Bachelor or higher	57 (69.5%)	221 (74.7%)		
Marital status				
• Single	31 (37.8%)	100 (33.8%)	0.458	0.498
• Married	51 (62.2%)	196 (66.2%)		
Smoking				
• Yes	04 (04.9%)	09 (03.0%)	0.653	0.419
• No	78 (95.1%)	287 (97.0%)		

§ P-value has been calculated using Chi-square test.

** Significant at p<0.05 level.

Table 4: Relationship between anxiety toward hair loss (n=378)

Factor	Anxiety		X2	P-value §
	Yes N (%) (n=82)	**No** N (%) (n=296)		
Type of hair				
• Dry	15 (18.3%)	87 (29.4%)		
• Oily	16 (19.5%)	55 (18.6%)	4.185	0.123
• Normal	51 (62.2%)	154 (52.0%)		
Duration of suffering from hair loss				
• <6 months	14 (17.1%)	80 (27.0%)	3.405	0.065
• >6 months	68 (82.9%)	216 (73.0%)		
History of stressful event				
• Yes	45 (54.9%)	73 (24.7%)	27.303	**<0.001 ****
• No	37 (45.1%)	223 (75.3%)		
Hair loss due to weight loss				
• Yes	26 (31.7%)	69 (23.3%)	2.406	0.121
• No	56 (68.3%)	227 (76.7%)		
Undergone anxiety treatment				
• Yes	20 (24.4%)	01 (0.30%)	70.799	**<0.001 ****
• No	62 (75.6%)	295 (99.7%)		
Having recurrent irresistible urges to pull out hair from scalp				
• Yes	12 (14.6%)	41 (13.9%)	0.033	0.857
• No	70 (85.4%)	255 (86.1%)		
Used of Minoxidil hair spray				
• Yes	19 (23.2%)	18 (06.1%)	21.238	**<0.001 ****

• No	63 (76.8%)	278 (93.9%)		
Family history of hair loss				
• Yes	59 (72.0%)	218 (73.6%)	0.094	0.759
• No	23 (28.0%)	78 (26.4%)		
Excessive hair styling				
• Yes	17 (20.7%)	73 (24.7%)	0.547	0.460
• No	65 (79.3%)	223 (75.3%)		
Associated condition that might cause hair loss***				
• Yes	43 (52.4%)	129 (43.6%)	2.032	0.154
• No	39 (47.6%)	167 (56.4%)		
Taking medicine for cancer, arthritis, gout, HTN depression or heart problems before hair loss				
• Yes	18 (22.0%)	22 (07.4%)	14.305	**<0.001 ** **
• No	64 (78.0%)	274 (92.6%)		

§ P-value has been calculated using Chi-square test.

** Significant at p<0.05 level.

*** pregnancy, childbirth, menopause, thyroid disease, Androgenic Alopecia, Alopecia Areata, DM, Iron deficiency anemia, Mineral deficiency, Renal disease, Liver disease, Infection, Hormonal imbalance, Malignant disease

Table 5: Multivariate regression analysis to determine the independent significant factor associated with anxiety on patient with hair loss (n=378)

Factor	AOR	95% CI	P-value
Nationality			
• Saudi	1.735	0.109 – 27.678	0.696
• Non-Saudi	Ref		
History of stressful event			

• Yes	3.287	1.836 – 5.885	**<0.001 ****
• No	Ref		
Used of Minoxidil hair spray			
• Yes	4.276	1.954 – 9.357	**<0.001 ****
• No	Ref		
Taking Medication for cancer, arthritis, gout, HTN depression or heart problems before hair loss			
• Yes	1.714	0.683 – 4.301	0.251
• No	Ref		
Seek treatment for anxiety			
• Yes	104.2	10.54 – 1030.2	**<0.001 ****
• No	Ref		

AOR-Adjusted Odds Ratio; CI – Confidence Interval; Ref-Reference

** Significant at p<0.05 level.