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ORIGINAL ARTICLE

Prevalence of Hair Loss among Men and its Association with Smoking and Stress: A Case Study in the City of Lahore, Pakistan

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ABSTRACT

Aim: To explore the prevalence of hair loss and its relation to men's stress and smoking,
Methodology: A cross sectional study attempts to explore the prevalence of baldness among the male residents of Lahore. For this purpose, a randomized sample of the male population was taken into consideration. The socio-demographic details, along with the smoking status of the sample were determined. Moreover, the body mass index (BMI) was also determined by referring to a prefixed formula. Baldness and stress levels were also quantified by taking into account the Norwood Hamilton categorical scale, and the perceived stress scale, respectively. A total of 250 male members were invited to participate in the research.
Results: The study results showed that 51.2%, 41.2% and 7.6%of male experienced moderate, high and low level of stress respectively. When taking the Norwood Hamilton categorical scale into account, the results revealed that most prevalent type of baldness was Type II, which is the fronto-temporal hairline recession, with 19.2% of the individuals experiencing it. Age was significantly associated with baldness. Similarly a higher frequency of baldness was recorded in those men who lived in a nuclear family arrangement.
Conclusion: No association was found between the type of baldness, stress level and smoking status.
Keyword: Alopecia, Baldness, Norwood Hamilton categorical scale, Perceived stress scale, smoking

INTRODUCTION

On average, humans lose 50 to 100 hairs per day.[1] This usually doesn't cause noticeable hair loss because new hairs start growing at the same time, as it is well proven that the fastest growing tissue in the human body is the hair follicle.[2] However, a daily hair fall that exceeds the said limit, is then labelled as "balding".[3] The incidence of hair loss is increasing globally and both men and women are equally affected by a hair loss,[4] that is related to several factors such as family trajectories, aging, hormonal changes, telogen effluvium (hair shedding due to illness), etc.[5] The psychological disequilibrium has been on the rise amongst the young male members of the society, who directly associate their physical appearance with feelings of low self esteem or insecurity, due to the hair loss that they have experienced.[6] Interestingly, stress or psychological distress is also considered to be one of the most significant factors that lead to baldness in both males and females, which eventually causes loss of sleep and appetite, previous empirical literature found this association.[7, 8]

Along with psychological disequilibrium, tobacco consumption or smoking is a considerable determinant of baldness in males.[5, 9, 10] Some studies have found a significant relationship between smoking and baldness.[11] This relationship stretches from the microvasculature of the dermal hair papilla to a smoking induced imbalance in the follicular protease/antiprotease systems, which controls the tissue remodeling during the hair growth cycle.[12]

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According to the data of the World Health Organization,[13] Pakistan is among top 15 countries in tobacco consumption. In 2013, World Health Organization estimated the prevalence of smoking in the population of Pakistan: 31.8% of men, 5.8% of women, and 19.1% of Pakistan's adult population were habitual of smoking. Males were predominant in both urban and rural areas.[14]

Globally, researches have been conducted to show the significant relationship between smoking and baldness, however, there is a dearth of research based on primary data to unleash the relationship between baldness and smoking in the context of Pakistan. Therefore, a nuanced investigation was needed to identify the prevalence of baldness, and its association with stress and smoking, among the male population in Pakistan.

SUBJECTS AND METHODS

Study Design and Setting: A cross-sectional survey was designed. The data were collected by physically going into the field. Lahore, capital of Punjab, which is the second largest and diverse city of Pakistan, was selected as the unit of analysis for the current research
Sample Selection: Lahore, the capital of Punjab, Pakistan was selected as unit of analysis. Male of different ages were randomly selected. Using 7% margin of error, 0.52 male baldness frequency[3] and 95% C.I. a sample size of 196 was calculated. However 250 participants were recruited in the study for maintaining result accuracy.
Study Tool: For the measurement of the prevalence and severity of baldness, the Norwood-Hamilton' Categorical scale[15] was used which consists of the grades or types of baldness, including "Type I, Type II, Type IIA, Type III,

Type IIIA, Type III Vertex, Type IV, Type IVA, Type V, Type VA, Type VI and Type VII" (Figure 1).

Data Collection: After ensuring the confidentiality and anonymity of the respondents, visual mapping technique was used and respondents were asked to tick the most appropriate option (prevalence of baldness). The body mass index (BMI) of the participants was measured by using the standard calculator, weight in centimeters (cm) and the weight in kilogram (kg). The information pertaining to the status of smoking was collected by asking close ended questions in the survey. Moreover, the stress level was measured by using the Perceived Stress Scale (PSS). The PSS scores for low stress range from 0-18, and the scores for moderate stress range from 19-36, while the scores for high stress range from 37-56.[16]

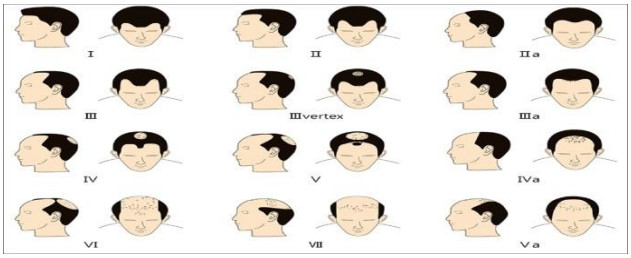

Figure 1: Norwood–Hamilton classification (adopted from Norwood OT. Male pattern baldness; classification and incidence. Southern Med J 1975;68 (11):1359-65)

Statistical Analysis: SPSS version 22.0 was used for the data analysis. For descriptive analysis, frequency, percentage and were applied. Inferential analysis was done to analyze the association between the variables. For this purpose, chi-square test was used to analyze the association between the variables with a significance of P-value ≤ 0.05.

RESULTS

A total of 250 participants was screened. Table 1 shows the socio-demographic profile of the study participants.

Most of the study participants were married (78.4%), living in a nuclear family arrangement (67.6%) having normal BMI (32.8%). Only 69 (27.6%) of the study participants were smokers.

Additionally, the Frequency and percentage of the Stress Levels (Perceived Stress Scale) and the Norwood Hamilton Stage of the sampled males is shown in Table 2. The frequency of low, moderate and high stress levels was 7.6%, 51.2% and 41.2% respectively. According to the Norwood Hamilton stage individuals, who experienced a little baldness (less than the Type-III) constituted 35.6% of the individuals, Type III-V of baldness was present among 51.2% of the sampled population, and Type VI and VII were identified in 13.2% of these individuals. It is noteworthy that the most prevalent type of baldness was Type II, which is the fronto-temporal hairline recession, with 19.2% of the individuals experiencing it. Whereas, the least prevalent type of baldness among the bald people was Type IIA, in which the hairline is anterior to the coronal plane, at a 2 cm anterior to the external auditory meatus, and Type IV, in which the vertex is free of hair, or sparse hair is present, both types showing the same percentage of only 4.4%.

The Chi-square association test was run in order to determine the relationship between the social-demographic variable, with the Norwood Hamilton category (Table 3). In this regard, the age and family type were the significant factors in determining the baldness in males. Type VI & VII of baldness were more prevalent in this category, with 39.1% of the sampled population to be the men aged more than 50 years, followed by 33.1% of them being between the age of 31 to 50 years. Whereas, men whose age ranged between 18-30 years, constituted the highest percentage of the individuals 13.3%. This difference was statistically significant (p=<0.001), where the Types VI & VII, with a total percentage of 34.3% of the sample population, were common among the males who were living in a nuclear family type, and Types VI & VII were common among 13.6% of those men who were living in an extended family arrangement. On the contrary, the relationship between the educational status, body mass index, smoking status and the type of baldness in males was statistically insignificant, with the values p=0.297, p=0.218, p=0.618, respectively.

Table 1: Socio-demographic Profile

		Frequency n (%)
Education	Illiterate	07 (2.8%)
	Up till Matric	106 (42.2%)
	Intermediate	57 (22.8%)
	Graduation	80 (32.2%)
Marital Status	Single	53 (21.2%)
	Married	196 (78.4%)
	Divorced	01 (0.4%)
Family Type	Nuclear	169 (67.6%)
	Extended	81 (32.4%)
Body Mass Index (BMI)	Under Weight	27 (10.8%)
	Normal	82 (32.8%)
	Overweight	70 (28%)
	Obese	71 (28.4%)
Smoking Status	Yes	69 (27.6%)
	No	181 (72.4%)

Table 2: Stress Levels (Perceived Stress Scale) and Norwood Hamilton Stage of the Individuals

		Frequency n (%)
Stress Levels (Perceived Stress Scale)	Low Stress	19 (7.6%)
	Moderate Stress	128 (51.2%)
	High Stress	103 (41.2%)
Norwood Stage	Type I	30 (12%)
	Type II	48 (19.2%)
	Type IIA	11 (4.4%)
	Type III	29 (11.6%)
	Type IIIA	18 (7.2%)
	Type III Vertex	21 (8.4%)
	Type IV	11 (4.4%)
	Type IVA	13 (5.2%)
	Type V	20 (8.0%)
	Type VA	16 (6.4%)
	Type VI	14 (5.6%)
	Type VII	19 (7.6%)

Similarly, in order to determine the association between the socio-demographic variables, and the stress

levels, the chi-square was referred to (Table 4). The findings showed that the age factor and the body mass index were statistically insignificant with the p-values of 0.514 and 0.329, respectively, whereas, the educational level, family type and smoking were found to be statistically significant, with a p-value of 0.011, 0.006 and 0.023, respectively.

Table 3: Association of Socio-demographic Profile with Norwood Hamilton Stages

		Norwood Hamilton Category						p-value
		Type I & II		Type III - V		Type VI & VII		
		Freq.	%age	Freq.	%age	Freq.	%age	
Age (Years)	18-30	42	50.6	30	36.1	11	13.3	<0.001
	31-50	37	30.6	44	36.4	40	33.1	
	> 50	10	21.8	18	39.1	18	39.1	
Education	Up till Matric	66	38.8	59	34.7	45	26.5	0.297
	Above Matric	23	28.8	33	41.2	24	30	
Family Type	Nuclear	45	26.6	66	39.1	58	34.3	<0.001
	Extended	44	54.3	26	32.1	11	13.6	
Body Mass Index	Under Weight	10	37	13	48.1	04	14.8	0.218
	Normal	32	39	33	40.2	17	20.7	
	Overweight	21	30	25	35.7	24	34.3	
	Obese	26	36.6	21	29.6	24	33.8	
Smoking	Yes	24	34.8	23	33.3	22	31.9	0.618
	No	65	35.9	69	38.1	47	26.0	
Total		89	35.6	92	36.8	69	27.6	

Table 4: Association of Socio-demographic Profile with Stress Levels

		Stress Levels (PSS)						p-value
		Low Stress		Moderate Stress		High Stress		
		Freq.	%age	Freq.	%age	Freq.	%age	
Age (Years)	18-30	04	4.8	44	53	35	42.2	0.514
	31-50	11	9.1	57	47.1	53	43.8	
	> 50	04	8.7	27	58.7	15	32.6	
Education	Up till Matric	08	4.7	84	49.4	78	45.9	0.011
	Above Matric	11	13.8	44	55	25	31.2	
Family Type	Nuclear	18	10.8	81	47.9	70	50.2	0.006*
	Extended	01	0.4	47	58.0	33	41.6	
Body Mass Index	Under Weight	03	11.1	11	40.7	13	48.1	0.329
	Normal	08	9.8	36	43.9	38	46.3	
	Overweight	05	7.1	37	52.9	28	40	
	Obese	03	4.2	44	62	24	33.8	
Smoking	Yes	04	5.8	27	39.1	38	55.1	0.023
	No	15	8.3	101	55.8	65	35.9	

DISCUSSION

After empirical literature review, very limited studies came into our knowledge explaining the prevalence of hair loss with its types and its relationship to stress and tobacco use in male gender specifically in Pakistan Context. In this study age was statistically significant variable, according to the Norwood Hamilton scale, with a p-value <0.001. The findings of our study also advocated the findings of a previously conducted research in Australia that suggested that age is significantly associated with baldness.[17] Also, on the Norwood Hamilton Scale, the family type appears to be significant with the p-value < 0.001. A higher incidence of baldness was recorded in those men who lived in a nuclear family arrangement, which is also in consistent with the extant studies' findings.[18, 19] Moving in the same stride, Soorihet al[3] found an association between hair loss and stress. A perceived stress scale was used to determine the stress level among 236 males. The results were quite similar in a context that the majority of the male respondents were going through moderate levels of stress.

In this study, the percentage of obesity (33.8%) was highest among the highest category of the Norwood grades i.e., Type VI and VII, followed by the overweight individuals (34.3%). Moreover, the stress levels were observed to be higher among the underweight respondents (48.1%), followed by the normal weight individuals. These specific findings in our study were statistically insignificant, contradicting the previous study findings of Yang et al[20] who determined an association between the severity of the grade and BMI. They concluded that the risk of developing alopecia was higher among the obese males (OR=4.97). This difference might be justified because of huge socio-cultural and diet preference differences between the study participants.

This study was the first of its kind to be conducted in Lahore and based on the various stages of baldness and their association with smoking and stress. This study will be helpful for stakeholders to develop a constructive problem

solving technique that will help to create awareness among the male members for the wellbeing of society.

CONCLUSION

Only 50 (20%) males were found smoker. Study concluded that there is no association between the levels of stress, smoking and the various stages of baldness.

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