Psychological Impact, Self-perception and the Contributing Factors in Patients with Androgenetic Alopecia

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Abstract

Background: Androgenetic alopecia (AGA) is a common hair disorder which affects the patients' psychology and social activities. Despite being the most prevalent alopecia in Malaysia, there are limited studies examining its psychological impact and patient's perception on AGA. This study assessed these effects and determined their contributing factors in AGA patients.

Methods: A prospective observational study was conducted involving all AGA patients attending dermatology clinics at two tertiary centers. Psychological impact was assessed using Hospital Anxiety and Depression Scale (HADS). Patient's perception was assessed using Visual Analog Scale (VAS).

Results: Sixty male patients and 41 female patients were recruited. The median age of patients was 29 years. The ethnic composition was Malay (30.7%), Chinese (34.7%) and Indian (34.6%). More females experienced mild AGA-related anxiety and depression compared to males (P<0.001). Young (age<40 years) and single individuals experienced more anxiety and depression than older, married patients (P<0.001). Patients who adopted coping strategies reported more anxiety (P=0.002) and depression (P<0.001) compared to those who were not using any coping strategy. Women were more dissatisfied with their hair condition (VAS score=4 [3])) compared to men (VAS score=5 [3]; P=0.002).

Conclusion: AGA impairs patients' psychology and affects their self-perception. Age less than 40 years old, female, unmarried, disease duration less than 4 years and adopting coping strategies were significant factors influencing the psychological impact and perception in AGA patients. Hence, early integration of psychological support to treatment of AGA is recommended.

Keywords: Androgenetic alopecia; Anxiety; Hair transplantation

Introduction

Androgenetic alopecia (AGA) is a common hair disorder [1] which usually begins between the ages of 12 to 40 years old [2]. In Asian countries, the prevalence of AGA is higher in males than females. In Korea, the reported prevalence is 14.1% in men and 5.6% in women [3]. In China, it was 21.3% in men and 6% in women [4]. A much higher prevalence of 63% was reported in Singaporean men [5]. In Malaysia, AGA is the most prevalent type of alopecia reported [6,7]. The most common ethnics affected by this condition here were Malays (42.1%), followed by Indians (26.3%), Chinese (26.3%) and others (5.3%) [1].

Hair plays an important role in determining self-image, identity, social perception and psychosocial functioning [8]. {J. Passchier Ph.D., July 1988 #59}Due to this reason, even a clinically imperceptible hair loss had been reported to be associated with reduced quality of life (QoL) [9]. Studies had highlighted several AGA-related negative psychological impacts such as anxiety, depression, low self-esteem and feeling unattractive [10,11]. These negative feelings may also lead to marital or sexual problems [12].

AGA not only causes psychological disturbances due to the nature of the disease, but also by its limited pharmacological therapies to prevent further progression of hair loss or in a minority to stimulate partial regrowth [13]. Some patients are managing their condition with camouflage techniques [14,15] and studies have shown that poor coping strategies for AGA may contribute to more negative perception of hair loss and self-image [16], thus adding onto the overall damaging psychological impact. Consequently, understanding the psychosocial aspect and perception of patients with AGA has become a matter of great concern. In Malaysia particularly, there is paucity in research exploring the patient's belief on AGA and how it relates to their mental health. Hence, the aims of this study were to investigate the psychological impact of AGA to the patients and their perception of their hair condition. Factors which could influence these effects were also investigated.

Materials and Methods

Patients and study design

We conducted a cross-sectional, observational study at the Dermatology Outpatient Clinics in The National University of Malaysia Medical Centre and Kuala Lumpur General Hospital over 1 year starting June 2015. The study was approved by The National University of Malaysia Research Ethic Committee (UKM 1.5.3.5/244/FF-2014-358) and the Medical Research Ethics Committee, Ministry of Health (NMRR-16-358-29565). All participants provided their written informed consent. We included patients aged 16 years and above with clinical diagnosis of AGA of all severities, who could understand and complete the questionnaires in English or Malay version. We excluded patients who were on medications that could cause alopecia, those with other types of alopecia and those with medical conditions which could lead to alopecia. Patients were asked to answer the Hospital Anxiety and Depression Scale (HADS) questionnaire and to rate subjectively the severity of their hair condition using the Visual Analog Scale (VAS).

Assessment

Hospital anxiety and depression scale (HADS): This is a validated questionnaire consisted of 14 items specifically designed for screening anxiety and depressive symptoms. It has two subscales: seven items reflecting anxiety (HADS-A) and seven items reflecting depression (HADS-D). The anxiety and depression subscales are scored from 0 to 3 (four-point Likert scales), giving maximum scores of 21 for anxiety and depression respectively. Score 7 or below is considered "normal/no problem". Scores 8-10 indicates "mild"; 11-14 indicates "moderate" and 15-21 indicates "severe". A score of 11 or higher indicates probable presence of the mood disorder namely anxiety or depression [17].

Visual analogue scale (VAS): A score ranging from 0 (completely dissatisfied) to 10 (completely satisfied) was used to gauge the patient's perception on the severity of their hair condition. A validated Malay version of the questionnaire was utilized [16,17].

Statistical analyses

Data were analyzed using Statistical Package for the Social Sciences (SPSS) software (version 22 for Windows; IBM–SPSS, Chicago, IL, USA). The qualitative data were presented in the forms of frequencies and percentages. Median (interquartile range [IQR]) were used for quantitative data. Kruskal Wallis test was used to compare HADS-A, HADS-D and VAS scores in different age groups, ethnicities, education levels, income and disease severity. Mann-Whitney U test was used to compare HADS-A, HADS-D, and VAS in gender, marital status and disease duration. Spearman rank correlation test (non-parametric) was used to establish the correlation between VAS and HADS scores. P values were considered significant when less than 0.05.

Results

Demographic characteristics

A total of 101 patients were recruited; 59.4 % were males and 40.6% females. The median (IQR) age was 29 (16) years. The ethnic compositions of these patients were Malay (30.7%), Chinese (34.7%), and Indian (34.6%). More than half of patients were single and received tertiary education and 30.7% were professionals. There were

36.6% of female patients had mild disease, 48.8% had moderate disease and 14.6% patients had severe disease. Among male patients, 18.3% had mild AGA, 36.7% had moderate disease and 45% with severe AGA. The median (IQR) duration of disease was 3 years. There were 57.4% patients had family history of AGA. The demographic characteristics of the patients were presented in Table 1.

Variables	Number (%)
Age	
<20	8 (7.9)
20-39	56 (55.5)
40-59	27 (26.7)
>60	10 (9.9)
Ethnicity	
Malay	31 (30.7)
Chinese	35 (34.7)
Indian	35 (34.6)
Disease Duration	
<4 years	55 (54.5)
>4 years	46 (45.5)
Education level	
Primary	5 (5)
Secondary	33 (32.6)
Tertiary	63 (62.4)
Marital Status	
Single	53 (52.5)
Married	47 (46.5)
Widowed	1 (1)
Income per month	
RM0	18 (17.8)
<RM1000	4 (4)
RM1000-3000	33 (32.7)
>RM3000	46 (45.5)
Occupation	
Manager	8 (7.9)
Professional	31 (30.7)
Technical	10 (9.9)
Administrative	17 (16.8)
Sales and Customer service	10 (9.9)
Unemployed, pensioner	11 (10.9)
Student	14 (13.9)

Disease Severity	
Ludwig scale	
Mild	15 (36.6)
Moderate	20 (48.8)
Severe	6 (14.6)
Variables	**Number (%)**
Disease Severity	
Norwood-Hamilton scale	
Mild	11 (18.3)
Moderate	22 (36.7)
Severe	27 (45)
Coping Strategies	
Male	
With coping strategies	24 (40)
Without coping strategies	36 (60)
Female	
With coping strategies	31 (75.6)
Without coping strategies	10 (24.4)
No coping strategies	46 (45.5)
Non-invasive coping strategies	52 (51.5)
Invasive coping strategies (hair transplant)	3 (3)
Mode of coping strategies used	
Change hairstyle	25 (45.5)

Wear head scarf	17 (30.9)
Wear wigs	6 (10.9)
Wear cap	4 (7.3)
Hair transplantation	3 (5.4)

Table 1: Patient demographic characteristics.

Most patients adopted coping strategies; majority being females. There were 45.5% patients changed their hairstyles, 30.9% wore head scarves, 10.9% wore wigs, 7.3% patients wore caps to conceal localized patches of alopecia and 5.5% patients had hair transplantation (Table 1).

The median (IQR) HADS-A score for total sample size was 7(5). This reflects no anxiety amongst AGA patients. Nevertheless, when comparing the median HADS-A according to gender, females had a significantly higher score (median [IQR] 8 (6) than males (median (IQR) 5 (5.75)) (P<0.001). The overall median (IQR) HADS-D score was 6 (7) but again, females experienced depression significantly with HADS-D score (median (IQR) 8 (8.5)) compared to males with AGA (median (IQR) 5 (7)). The median HADS scores were significantly higher in patients who had AGA for less than 4 years compared to those where the disease was presented for 4 years and above. There was no significant difference in HADS-A and HADS-D among male patients throughout the disease severity spectrum. However, anxiety and depressive symptoms were reported in females from all disease severity. Patients who use coping strategies for AGA reported more anxiety (P=0.002) and depression (P<0.001) with their hair condition compared to those who did not adopt any coping strategy. There were no significant differences in median HADS-A and HADS-D scores among different education levels, occupations, ethnicities and monthly income. Individuals less than 40 years (P<0.001) and single (P<0.001) had significantly more anxiety and depression than older, married patients (Table 2 and Table 3).

Variables	HADS-A Median (p25-p75)	Comparison of patient groups for HADS-A scores	P value (b)	HADS-D Median (p25-p75)	Comparison of patient groups For HADS-D scores	P value (b)
Age						
1. <20	8 (5.75-14)	1 vs. 2	0.759	8 (6.5-17)	1 vs. 2	0.386
2. 20-39	8 (6-10)	1 vs. 3	0.007	7.5 (5-10.75)	1 vs. 3	0.011
3. 40-59	5 (2-6)	1 vs. 4	0.005	2 (1-5)	1 vs. 4	0.017
4. >60	1 (0-6)	2 vs. 3	<0.001	1.5(0-6)	2 vs. 3	<0.001
		2 vs. 4	<0.001		2 vs. 4	0.001
		3 vs. 4	0.115		3 vs. 4	0.488
Disease Severity						
Ludwig scale						
Mild	7 (5-8)	Mild-moderate	0.068	4 (3-6)	Mild-moderate	0.001
Moderate	9 (6-19.75)	Mild-severe	0.002	9 (6.25-12)	Mild-severe	0.001

Severe	15.5 (9.5-17.5)	Moderate-severe	.021	18 (13.5-19)	Moderate-severe	0.006
P value (a)	0.018			0.001		
Norwood-Hamilton scale						
Mild	4 (2-8)			3 (1-8)		
Moderate	5 (3.5-8.25)			5.5 (1.75-7.25)		
Severe	5 (2-9)			3 (1-9)		
P value [a]	0.802			0.455		

Table 2: HADS-A and HADS-D scores according to age and disease severity (Abbreviations: HADS-A, Hospital anxiety and depression scale-anxiety subscale; HADS-D, Hospital anxiety and depression scale-depression subscale; *vs*: versus; (1): <20; (2): 20-39; (3): 40-59; (4):>60 (a) overall P value calculated using Kruskal Wallis test, (b) data compared using Mann-Whitney U test.

The median (IQR) VAS score for total sample size was 4 (3). Females had lower VAS score (4 [3]) than males (5 [3]) (P=0.002). The median VAS score was significantly lower in patients with AGA for less than 4 years compared to those with disease duration of 4 years or more (P<0.001). With regards to disease severity, there was no significant difference in patients' perception regarding their hair loss for both males (P=0.057) and females (P=0.555). Consistently, patients who used invasive or non-invasive coping strategy for AGA were found to be more dissatisfied with their hair condition compared to those who did not adopt any coping strategy (P=0.021). There was significant difference in median VAS score among different education levels whereby patients who only received primary education had higher VAS score (7 (3.5)) compared to those with secondary (5 (2.5)) and tertiary education levels (4 (3)) (P=0.004). Significant differences in median (IQR) VAS scores were also observed across various occupations where managers (7(7)), pensioners and unemployed individuals (7 (3)) had the highest VAS scores, followed by technical (5 (4)), professionals (4 (3)), administrative (4 (3)), sales and customer service (4 (4.5)) and students (3.5 (1.5)). P=0.009, No significant difference in VAS score was reported across different ethnicities, P=0.089, and monthly income P=0.061. Previous studies observed, age less than 40 years (P<0.001) and single (P<0.001). AGA patients were more dissatisfied with their hair condition compared to older, married patients (Table 3 and Table 4).

Variables	HADS-A Median (p25-p75)a	HADS-D Median (p25-p75)a	VAS Median (p25-p75)a
Disease Duration			
<4 years	8 (5-10)	8 (5-12)	4 (2-5)
≥ 4 years	5 (2-8)	3 (1-7.25)	6 (4-7.25)
P value	<0.001	<0.001	<0.001
Ethnicity			
Malay	7 (5-9)	6 (3-8)	5 (4-7)
Chinese	8 (4-10)	6 (3-10)	4 (3-5)
Indian	6 (2.75-10)	6.5 (1-11.25)	5 (3-7)
P value	0.755	0.610	0.089
Education level			
Primary	0 (0-5)	1 (0-4.5)	7 (5-8.5)
Secondary	7 (4-9)	5 (2-8)	5 (3.5-6)
Tertiary	8 (5-10)	7 (3-10)	4 (3-6)
P value	0.05	0.082	0.004
Marital status			

Single	8 (6.5-10)	8 (5-11.5)	3 (2-4)
Married	5 (2-7)	3 (1-6)	6 (5-8)
P value	<0.001	<0.001	<0.001
Income per month			
RM0	8 (4-11.5)	6.5 (4-10.5)	4 (2.75-5)
<RM1000	5.5 (5-8.25)	4.5 (2.25-8.25)	6.5 (5.25-7)
RM1000-3000	6 (3-9)	6 (2-8.5)	4 (2.5-6)
>RM3000	7 (4-9.25)	5 (2-10)	4.5 (3-7)
P value	0.227	0.843	0.061
Occupation			
Manager	4 (2-7.75)	2 (1-6.5)	7 (4.5-8.75)
Professional	8 (5-10)	6 (3-9)	4 (3-6)
Technical	5 (2.25-8.25)	4 (2.75-9)	5 (2.75-6.75)
Administrative	6 (3.5-8)	8 (2-9.5)	4 (3-6)
Sales and Customer service	9 (6.5-10)	9 (3.75-12)	4 (1.5-6)
Unemployed, pensioner	5 (0-8)	2 (0-6)	7 (5-8)
Student	8 (6.25-12)	7 (4.75-11.5)	3.5 (2.75-4.25)
P value	0.178	0.123	0.009
Coping strategies			
None	5 (2-8)	3 (1-6.25)	5.5 (4-8)
Non-invasive	8 (6-10)	8 (5-11)	4 (3-5)
Invasive (hair transplantation)	10 (2-19)	19 (1-19)	0 (0-2)
P value	0.002	<0.001	0.021

Table 3: Correlation between single variable to HADS-A, HADS-D and VAS (Abbreviations: HAD-A: Hospital Anxiety and Depression Scale-Anxiety subscale; HADS-D: Hospital Anxiety and Depression Scale-Depression subscale; VAS: Visual Analog Scale (a) Data presented are the median and 25th-75th percentile.

Variables	VAS Median (p25-p75)	P value [a]	Comparison of patient groups	P value [b]	Disease Severity				
					Ludwig scale				
Age					Mild	5 (3-7)			
1. <20	3 (1.25-4)		1 vs. 2	0.227	Moderate	4 (3-5)	0.057		
2. 20-39	4 (2.25-5)	<0.001	1 vs. 3	<0.001	Severe	0.5 (0-1.25)			
3. 40-59	6 (5-7)		1 vs. 4	0.001	**Norwood-Hamilton scale**				
4. >60	7.5 (5.75-9.25)		2 vs. 3	<0.001	Mild	5 (4-7)			
			2 vs. 4	<0.001	Moderate	4 (3-7.25)	0.555		
			3 vs. 4	0.071					

Severe	6 (4-7)			

Table 4: VAS scores according to age and disease severity (Abbreviation: VAS: Visual Analog Scale; (1): <20; (2): 20-39; (3): 40-59; (4): >60 (a) overall P value calculated using Kruskal Wallis test, (b) data compared using Mann-Whitney U test).

Correlation of HADS and VAS scores

Significant negative correlation was also observed between HADS-A and VAS scores (r=-0.692; P<0.001) and between HADS-D and VAS scores (r=0.733; P<0.001).

Discussion

The association between AGA and psychological disorders is well documented [18]. Our study shows that AGA had negative psychological impact especially in female patients who experienced mild anxiety and depression. This finding is comparable to studies by Aldermir et al. [19], Yu et al. [20] and Tabolli et al. [21]. On average, AGA patients were not satisfied with their hair condition as reflected by their VAS. We also found a negative correlation between HADS and VAS which is consistent with the study by Schmidt et al. [9] and Yu et al. [20]. The reason for this may be due to the influence of negative emotions onto self-perception.

Patients aged less than 40 years old experienced worse anxiety and depression compared to older patients. This is in agreement with five other studies [10,20,22-24] which also reported greater degree of psychological impact among younger patients. Early onset of hair loss negatively affects self-image and self-esteem in these patients. Low self-esteem makes it more difficult when looking for life partners and employment [25]. Moreover, peer pressure exaggerates the need for social acceptance which could lead to feelings of stigmatization. These subsequently cause younger patients to be more vulnerable to depression and anxiety [26]. On the contrary, older patients were least affected psychologically. This might be explained by the fact that older patients are more established in their occupation and marital life therefore, external appearance has very small psychological impact on their lives. Our finding is in direct contrast to Sawant et al. [27], who noticed younger patients had less depression and anxiety compared to older patients. On the other hand, there were also studies, which found no significant differences in perception of hair condition [28] and psychological aspect [29] across different age groups.

Our study also found that younger patients had negative perception of their hair condition while other study did not find any difference [28]. One possible explanation for our observation is that when patients are psychologically disturbed by their hair condition; this results in an undesirable perception.

Single individuals were found to experience more anxiety and depression and were more dissatisfied with their hair condition compared to those who were married. This finding concurs with other studies [30,31] and may be explained by the fact that physical attractiveness is known to affect dating [32]. Both men and women believe that hair loss will erode their chances in romance [33] because baldness is often perceived as an unattractive quality. This is also supported by the findings from Lee et al. [32], where over 90% of women and non-balding men responded that balding men had a disadvantage in dating or marriage.

Similar to the trend seen in other studies [10,28], our study shows female patients with more severe AGA felt more depressed and anxious compared to the males. This is because women regard hair as an indicator of personality, femininity, attractiveness and sexuality [10,23]. This result was not observed in male patients presented with varying degrees of AGA severity. Our finding is in contrast to Yu et al. [20] and Kranz et al. [29] who found young men with more severe AGA reported higher level of psychological distress, anxiety, and depression.

In patients with alopecia for less than 4 years, AGA caused the patients to be more depressed, anxious and dissatisfied with their hair condition compared to those with longer disease duration. These findings suggest that patients experience non-acceptance, depression and anxiety at the beginning of the disease but these feelings become attenuated over time as patients adapt to the condition by developing the necessary positive coping skills. This also highlights that it takes a long time for patients to accept the nature of this condition which is almost similar to coping with chronic medical conditions [18]. Our findings are in contrast with studies by Cash et al. [31] and Han et al. [22] who reported psychological aspect was more severely afflicted in patients who had a longer duration of AGA. However, there were also studies showing no significant association between disease duration and psychological impact [20,23,28].

Although there was no significant difference in HADS scores in different education levels, occupations and monthly income, we observed that those who received secondary and tertiary education were remarkably more dissatisfied with their hair condition. This could be due to their increased awareness and self-consciousness about image and the need for high degree of social interaction in these group of patients [30,33]. Interestingly, we found that AGA caused greater dissatisfaction and psychological impairment among patients adopting coping strategies. Patients, who used invasive coping method for instance hair transplantation, were completely dissatisfied with their hair condition and experienced mild anxiety and severe depression than those who used non-invasive coping methods. Similar results were also reported by Cash et al. [10] and Zhuang et al. [28] who discovered patients who were actively seeking dermatologic treatment were substantially more distressed and anxious compared to non-treatment-seeking group. We postulate that those who adopted invasive coping mechanism were most psychologically affected and had the worst expectations of their condition. Kranz et al. [29] and Cartwright et al. [23] explained that problem-focused strategies for example active coping and instrumental support may not be effective in uncontrollable situations where little change can be done. Therefore, successful coping is best pursued via active emotional coping such as acceptance of changes in appearance [29] or improve psychological health to cope with the distress caused by AGA [27]. Psychological counselling and social support network can be utilized to restore the integrity of patient's personality functioning, self-assurance, minimize stigmatization and improve patient's outlook towards life [27,34]. Therefore, it is pivotal for the practitioners to address various psychological issues arising from AGA to improve the overall treatment outcome. Inappropriate use of cosmetic aids or camouflaging products might also contribute to less hair satisfaction [22,35]. For instance, hair styling and camouflaging are often not enough to conceal moderate to severe alopecia. Thus, an integration of hairpiece or wig may be better options for advanced stages of hair loss [14,15,36,37]. In such circumstances, the practitioner's role in guiding the patients to obtain the appropriate cosmetic aids or camouflages may also be able to lessen patients' anxiety and depression.

Conclusion

AGA leads to anxiety and depression especially in women. Patient's perception on their disease severity determines the severity of the psychological impact. Young age less than 40 years old, single, females with shorter disease durations are the ones most adversely affected by the disease. Adopting coping methods without acceptance of the disease leads to adverse psychological impact. Therefore, early psychological support to facilitate acceptance of disease is recommended in AGA management.

Acknowledgement

References

1. Yin YL, Chew CK (2012) A 10-year retrospective review of non-scarring alopecia in a tertiary hospital in Malaysia. Malay J Dermatol 29: 12-15.

2. Kapadia N, Ahmad TJ, Borhany T (2008) Male androgenetic alopecia treated with finasteride. J Pak Assoc Dermatol 18: 232-234.

3. Paik JH, Yoon JB, Sim WY, Kim BS, Kim NI (2001) The prevalence and types of androgenetic alopecia in Korean men and women. Br J Dermatol 145: 95-99.

4. Wang TL, Zhou C, Shen YW, Wang XY, Ding XL, et al. (2010) Prevalence of androgenetic alopecia in China: a community-based study in six cities. Br J Dermatol 162: 843-847.

5. Tang PH, Chia HP, Cheong LL, Koh D (2000) A community study of male androgenetic alopecia in Bishan, Singapore. Singapore Med J 41: 202-205.

6. Dermatological Society of Malaysia [WWW document]

7. Malaysian Society for Hair Science 2006. [WWW document].

8. Van der Donk J, Passchier J, Dutree-Meulenberg RO, Stolz E, Verhage F (1991) Psychologic characteristics of men with alopecia androgenetica and their modification. Int J Dermatol 30: 22-28.

9. Schmidt S, Fischer TW, Chren MM, Strauss BM, Elsner P (2001) Strategies of coping and quality of life in women with alopecia. Br J Dermatol 144: 1038-1043.

10. Cash TF, Price VH, Savin RC (1993) Psychological effects of androgenetic alopecia on women: comparisons with balding men and with female control subjects. J Am Acad Dermatol 29: 568-575.

11. Alfonso M, Richter-Appelt H, Tosti A, Viera MS, García M (2005) The psychological impact of hair loss among men: a multinational European study. Curr Med Res Opin 21: 1829-1836.

12. Eckert J (1976) Diffuse hair loss in women: the psychopathology of those who complain Acta Psychiatr Scand 53: 321-325.

13. Sinclair RD, Dawber RP (2001) Androgenetic alopecia in men and women. Clin Dermatol 19: 167-178.

14. Rogers NE, Avram MR (2008) Medical treatments for male and female pattern hair loss. J Am Acad Dermatol 59: 547-566.

15. Dinh QQ, Sinclair R (2007) Female pattern hair loss: current treatment concepts. Clin Interv Aging 2: 189-199.

16. Reid EE, Haley AC, Borovicka JH, Rademaker A, West DP, et al. (2010) Clinical severity does not reliably predict quality of life in women with alopecia areata, telogen effluvium, or androgenic alopecia. J Am Acad Dermatol 66: e97-102.

17. Luo N, Wang Y, How CH, Tay EG, Thumboo J, et al. (2015) Interpretation and use of the 5-level EQ-5D response labels varied with survey language among Asians in Singapore. J Clin Epidemiol 68: 1195-1204.

18. Aghaei S, Saki N, Daneshmand E, Kardeh B (2014) Prevalence of psychological disorders in patients with alopecia areata in comparison with normal subjects. ISRN Dermatol 2014: 304370.

19. Seçil Aldemir SE, Ercan D, Seda T, Merve T, Seval E (2015) Anger, anxiety and depression in females with diffuse alopecia. Dicle Med J 42: 335-341.

20. Yu NL, Tan H, Song ZQ, Yang XC (2016) Illness perception in patients with androgenetic alopecia and alopecia areata in China. J Psychosom 86 :1-6.

21. Tabolli S, Sampogna F, di Pietro C, Ribuffo M, Abeni D, et al. (2013) Health status, coping strategies, and alexithymia in subjects with androgenetic alopecia: a questionnaire study. Am J Clin Dermatol 14: 139-145.

22. Han SH, Byun JW, Lee WS, Kang H, Kye YC, et al. (2012) Quality of life assessment in male patients with androgenetic alopecia: result of a prospective, multicenter study. Ann Dermatol 24: 311-318.

23. Cartwright T, Endean N, Porter A (2009) Illness perceptions, coping and quality of life in patients with alopecia. Br J Dermatol 160: 1034-1039.

24. Wells PA, Willmoth T, Russell RJ (1995) Does fortune favour the bald? Psychological correlates of hair loss in males. Br J Psychol 86: 337-344.

25. Price VH (2003) Androgenetic alopecia in adolescents. Cutis 71: 115-121.

26. Girman CJ, Rhodes T, Lilly FR, Guo SS, Siervogel RM, et al. (1998) Effects of self-perceived hair loss in a community sample of men. Dermatology 197: 223-229.

27. Sawant N, Chikhalkar S, Mehta V, Ravi M, Madke B, et al. (2010) Androgenetic Alopecia: Quality-of-life and Associated Lifestyle Patterns. Int J Trichol 2: 81-85.

28. Zhuang XS, Zheng YY, Xu JJ, Fan WX (2013) Quality of life in women with female pattern hair loss and the impact of topical minoxidil treatment on quality of life in these patients. Exp Ther Med 6: 542-546.

29. Kranz D (2011) Young men's coping with androgenetic alopecia: acceptance counts when hair gets thinner. Body Image 8: 343-348.

30. Tahir K, Aman S, Nadeem M, Kazmi AH (2013) Quality of Life in Patients with Androgenetic Alopecia. Annals 19: 150-154.

31. Cash TF (1992) The psychological effects of androgenetic alopecia in men. J Am Acad Dermatol 26: 926-931.

32. Lee WS, Lee HJ (2012) Characteristics of androgenetic alopecia in asian. Ann Dermatol 24: 243-252.

33. Ramazanpour A, Gochai J, Ghanbari A, Alizadeh N, Darjani A, et al. (2012) A comparative study on health-related quality of life in healthy people and patients with alopecia areata. World Appl Sci J 18: 689-692.

34. Picardi A, Pasquini P, Cattaruzza MS, Gaetano P, Baliva G, et al. (2003) Psychosomatic factors in first-onset alopecia areata. Psychosomatics 44: 374-381.

35. Kim HJ, Sim WY, Song JY (2001) Assessment of the Characteristics of Illness Behavior and Quality of Life in Patients with Androgenetic Alopecia. Korean J Dermatol 39: 1094-1099.

36. Inui S, Inoue T, Itami S (2013) Psychosocial impact of wigs or hairpieces on perceived quality of life level in female patients with alopecia areata. J Dermatol 40: 225-226.

37. Inui S, Inoue T, Itami S (2013) Effect of wigs on perceived quality of life level in androgenetic alopecia patients. J Dermatol 40: 223-225.