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A Study on Impact of Dietary Habits on Hair Loss in Adult Males

Hee-La Ko[1] and Myung-Sun Lee[2*]

[1]Graduate Student, Beauty Medical Major, Department of Beauty and Health Care, Daejeon University
[2*]Professor, Department of Beauty Ddsign, Daejeon University
Kohl.920927@hanmail.net[1] and laura.2711@naver.com[*2]
Corresponding Author*: laura.2711@naver.com

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ABSTRACT
Hair loss is a major concern in the era of life extension and an significant means of expressing the human desire for attractiveness. Balanced nutrition and a healthy lifestyle contribute to a healthy life and are indispensable for the prevention of all diseases. Accordingly, this study aims to suggest directions for hair growth and multifactorial hair loss prevention, focusing on integrated insight into the impact of eating habits and lifestyle on hair loss.

Keywords: Hair Loss, Eating Habits, Lifestyle, Stress, Shampooing, Scalp Hair

1. INTRODUCTION

Malnutrition may affect both hair structure and hair growth. In the past, hair loss was assumed to be caused by aging and genetic factors, but more recently, it has been reported that hair loss is induced by various causes. In particular, poor eating habits, stress, irregular life patterns, and chemical use are found to be common causes, and a correlation with exercise has also been reported [1].

Alopecia refers to the absence of hair in areas where hair should normally be present, and while it is not life-threatening, it is a disease that reduces the quality of life [2]. Typically, men mainly experience thinning hair loss primarily on the forehead and crown of the head [3]. Androgenetic alopecia is the most common type of alopecia and alopecia is affecting approximately half of adults in their 40s in the Western countries, while 15-20% in Korea [4]. There are several treatments for androgenetic alopecia, ranging from hair transplantation to finasteride and minoxidil, but some people are are resistant to taking medications or receiving hair transplants [5].

Previous studies have shown that unhealthy lifestyle and nutritional deficiencies cause hair loss due to abnormalities in hormone secretion and imbalances in hair nutrition, while drinking and smoking constrict blood vessels and cause persistent hypoperfusion of the hair roots, resulting in hair loss and the degree of hair loss increases with increasing frequency [6]. In addition, studies have shown that sleep disturbances affect the immune system, and that progressive hair loss impairs quality of life in several aspects, increasing psychological and psychiatric risks [7]. It has been proven that acute or chronic stress is significantly associated with hair growth inhibition, increased granulation of mast cells, and inflammation around the hair follicle [8]. Furthermore, a study from Institute of Hair and Beauty Medicine, Wonju College of Medicine, Yonsei University, claims that there is a clear relationship between exercise and alopecia [9].

In particular, proper nutrition is essential for balancing hair growth and resting phases, and nutritional deficiency has a negative effect on hair structure and growth, inhibits hair growth, and causes hair loss [10]. Improving eating habits is not simply implying dietary restrictions, but rather about forming healthy habits through a balance of nutrition that has been scientifically tested and validated [11].

Recent studies on hair loss have emphasized the importance of lifestyle and diet, but there is a significant lack of specific reports on the association between hair loss and dietary habits. Accordingly, this study aims to examine the dietary habits and lifestyles of adult males to determine their relationship with hair loss. Through this, this study seeks to provide academic data on the proper lifestyle and balanced eating habits for the prevention of hair loss and provide specific directions for the prevention of hair loss.

2. MATERIALS AND METHODS

2.1 Subjects and data collection

A self-administered survey was conducted on adult males in their 20s to 60s. Data was collected from November 27, 2023 to January 21, 2024, and and a total of 350 copies were distributed and returned, and 316 copies were used for the final analysis, excluding 34 copies that were insincerely answered.

2.2 Measurement tools

A questionnaire was used for data collection, consisting of 10 items on general characteristics, 10 items on hair loss status, and 20 items in eating habits. A cross-analysis was conducted to examine subject's eating habits and determine whether there were differences according to the general characteristics.

For the eating habits, subjects were divided into two groups based on the average scores: a high-class group with positive eating habits and a low-class group with negative eating habits, analyzing its association with hair loss status.

2.3 Data analysis method

The collected data was analyzed using the SPSS version 25.0 program, and the data processing and analysis methods are as follows. First, frequency analysis was conducted to examine the general characteristics of the subjects. Second, exploratory factor analysis was conducted to verify the validity of the measurement tool, and Cronbach's α coefficient was calculated to verify reliability. Third, a cross-analysis was conducted to examine eating habits of subjects and determine whether there were differences according to the general characteristics. Fourth, an independent sample t-test and one-way ANOVA were conducted to investigate the hair loss status of adult males and whether there were differences depending on the general characteristics and eating habits of subjects, and the Scheffe test was performed as a post-hoc test.

3. RESULTS AND DISCUSSION

3.1. General characteristics

The results of the frequency analysis on the general characteristics of subjects are shown in [Table 01].

Table 01: General characteristics of subjects

Division		Frequency(N)	Percent (%)
Age	20s	60	19.0
	30s	66	20.9
	40s	78	24.7
	50s	87	27.5
	60s or older	25	7.9
Marital status	married	207	65.5
	unmarried	109	34.5
Occupation	College students	41	13.0
	Sales/Service	52	16.5
	Production/Technical	67	21.2
	Officer/Management	108	34.2
	Education/Professional	27	8.5
	Other	21	6.6
Sleep pattern	Very regular	32	10.1
	Regular	150	47.5
	Irregular	106	33.5
	Very Irregular	28	8.9
Average sleep time	Less than 6 hours	116	36.7
	6-7 hours	128	40.5
	7 hours or more	72	22.8
Stress level	Low	32	10.1
	Middle	149	47.2
	High	135	42.7
Exercise habits	Not exercising	116	36.7
	1-2 times per week	119	37.7

	3-4 times per week	60	19.0
	5 or more times per week	21	6.6
Shampooing frequency	1-2 times a week	10	3.2
	Every two days	19	6.0
	Once a day	204	64.6
	Twice a day	83	26.3
Shampoo Type	General Purpose Shampoo	188	59.5
	Shampoos for hair loss	70	22.2
	Shampoos for scalp care	48	15.2
	Soap	10	3.2
Total		316	100.0

3.2. Verification of validity and reliability

The validity and reliability verification results for hair loss status are shown in [Table 02]. First, the KMO value was 0.896, which was suitable as a possible sample for factor analysis, and the Bartlett test result showed a significant level of 1500.004 (df=21, p=.000). Three items (8, 9, and 10) were removed, deriving a total of one factor, and the total cumulative variance explained by these factors was shown to be 67.508%. In addition, the factor loadings of each factor were found to be over 0.40, indicating the validity for factors, and the extracted factor was named 'hair loss status' (67.508%). Finally, the reliability analysis showed a value of 0.919, indicating its reliablility.

Table 02: Verification of validity and reliability of hair loss status

Items		Component
		Factor 1
Factor 1 Hair loss status	5. The amount of hair has decreased.	.894
	1. Hair is limp and lacking in volume	.841
	3. The parting line becomes wider or the scalp appears exposed under light.	.838
	2. The hair has become thinner.	.831
	4. More hair falls out when washing hair than before.	.796
	7. the scalp feels hard and the crown looks hollow	.793
	6. the forehead gradually recedes and widens.	.750
Distinct values		4.726
Variance explanation (%)		67.508
Cumulative explanation (%)		67.508
Reliability		.919
KMO=.896, Bartlett's test χ^2=1500.004 (df=21, p=.000)		

3.3. EATING HABITS IN ADULT MALES

1) Overall eating habits

The results of the descriptive statistical analysis on the overall eating habits of adult males are shown in [Table 03].

Table 03: Overall eating habits

Division		Mean (M)	Standard Deviation (SD)
Eating Habits	1. I usually eat regular meals.	3.05	.988
	2. I am not a picky eater and tend to consume a balanced diet.	3.26	.748
	3. I tend to take vitamins regularly.	2.40	1.229
	4. I tend to eat fruits often.	2.10	.839
	5. I tend to eat vegetables often.	2.79	.925
	6. I tend to eat seaweed (seaweed, kelp, etc.) often.	2.42	.766
	7. I often eat foods rich in protein (lean meats, eggs, fish, etc.) at meals.	2.75	.904

	8. I tend to eat nuts frequently	2.06	.697
	9. I tend to drink plenty of water.	2.54	1.090
	10. I often drink tea rich in catechins (e.g., green tea, pu-erh tea, or black tea).	2.05	.905
	11. I don't eat out often.	2.84	1.005
	12. I do not frequently consume instant foods (ramen, ready-to-cook foods, etc.).	2.98	1.012
	13. I do not eat fast food (pizza, chicken, hamburgers, etc.) often.	3.50	.921
	14. I do not frequently consume foods high in fat (fried foods, fatty meats, etc.).	3.16	.955
	15. I do not frequently consume refined carbohydrates (bread, sweets, flour foods, etc.).	3.67	.868
	16. I don't smoke cigarettes.	3.39	1.487
	17. I do not drink alcohol often.	3.07	1.321
	18. I do not frequently drink coffee or other beverages with high caffeine content.	2.46	1.093
	19. I do not frequently consume irritating foods (spicy, salty, etc.).	2.80	.882
	20. I do not consume sweet foods (juice, soda, candy, etc.) frequently.	3.06	.816
	Total	2.82	.374

2) Differences between eating habits groups according to general characteristics

Table 04 shows the analysis results on the differences in eating habits groups according to general characteristics. First, for eating habits, a mean score of 2.82 was used as a standard value to categorize those with good eating habits as the high-class group and those with poor eating habits as the low-class group. 157 people (49.7%) were classified as high-group, while 159 (50.3%) as low-group.

For general characteristics, statistically significant differences were found depending on age, marital status, sleep pattern, average sleep time, stress level, and exercise habits ($p<.05$).

First, for age, it was found that those in their 50s and 60s or older had relatively better eating habits than those in their 20s and 40s. It was consistent with the recent study by Ji-Hyun Kim and Mi-Young Ham (2021), which found that people in their 50s have relatively more positive eating habits than people in their 20s [12]. For marital status, married people were found to have relatively better eating habits than unmarried people. This suggests that living together through marriage rather than being single is more favorable for maintaining stable eating habits. For the sleep pattern, it was found that those with very regular or regular habits tend to have relatively good eating habits, being included in the high-class groups, and for the average sleep time, those who slept 6-7 hours or more than 7 hours had relatively better eating habits than those who slept less than 6 hours. This suggests that sleep quality and duration have a valid effect on dietary habits. Finally, for stress level, the lower the stress level, the higher the proportion of people in the high-class group with good eating habits, and for exercise habits, the higher the exercise level, the higher the proportion of people in the high-class group with good eating habits. These findings show that general characteristics and eating habits are closely related in many aspects.

Table 04: Differences in eating habits groups according to general characteristics

Division		Eating habits		χ^2 (p)
		High-class group	Low-class group	
Age	20s	27(45.0)	33(55.0)	15.486** (.004)
	30s	26(39.4)	40(60.6)	
	40s	33(42.3)	45(57.7)	
	50s	52(59.8)	35(40.2)	
	60s or older	19(76.0)	6(24.0)	
Marital status	married	113(54.6)	94(45.4)	5.777* (.016)
	unmarried	44(40.4)	65(59.6)	
Occupation	College students	17(41.5)	24(58.5)	10.486 (.063)
	Sales/Service	20(38.5)	32(61.5)	
	Production/Technical	34(50.7)	33(49.3)	
	Officer/Management	62(57.4)	46(42.6)	
	Education/Professi	17(63.0)	10(37.0)	

	onal			
	Other	7(33.3)	14(66.7)	
Sleep pattern	Very regular	23(71.9)	9(28.1)	26.091*** (.000)
	Regular	87(58.0)	63(42.0)	
	Irregular	42(39.6)	64(60.4)	
	Very Irregular	5(17.9)	23(82.1)	
Average sleep time	Less than 6 hours	46(39.7)	70(60.3)	8.734* (.013)
	6-7 hours	75(58.6)	53(41.4)	
	7 hours or more	36(50.0)	36(50.0)	
Stress level	Low	24(75.0)	8(25.0)	13.932** (.001)
	Middle	79(53.0)	70(47.0)	
	High	54(40.0)	81(60.0)	
Exercise habits	Not exercising	40(34.5)	76(65.5)	17.023** (.001)
	1-2 times per week	69(58.0)	50(42.0)	
	3-4 times per week	36(60.0)	24(40.0)	
	5 or more times per week	12(57.1)	9(42.9)	
*p<.05, **p<.01, ***p<.001				

3.4. Hair loss status in adult males

Table 05 shows the analysis results on the hair loss status of adult males. Overall, the average score of hair loss status was measured to be 2.83.

For general characteristics, statistically significant differences were found depending on age, marriage, job, stress level, exercise habits, and shampoo types (p <.01). First, for age, it was found that the older the age, the greater the hair loss. Juyoung Lee (2013) reported that hair loss gradually increases in the 20s and 30s and increases rapidly from the 40s, which is consistent with the results of this study [13] and suggests a link between aging and hair loss.

For marital status, married people were found to have relatively more hair loss than unmarried people. For the occupation, those in sales/service positions were found to have relatively more hair loss, suggesting that hair loss is related to professional stress in service jobs that require more emotional labor. It was found that irregular sleep patterns and less sleep time were associated with more hair loss, which is in line with the findings from the study by Kyung-Hee Kim and Hee-Sook Jo (2013) that modern people are sleeping less [14], and that alopecia increases when sleep quality deteriorates [15]. This suggests that sleep plays an important role in a healthy daily routine and is essential for the prevention of hair loss.

Additionally, it is shown that improper shampooing habits can lead to hair loss [18,19], and longer shampooing intervals have been shown to be associated with hair loss. This is in line with previous findings that low washing frequency has a detrimental effect on hair [20]. The habit of maintaining daily cleanliness with the right shampoo method is found to prevent hair loss [21], and the importance of cleanliness of the scalp and hair is emphasized, considering its significant impact on hair loss.

Table 05: Differences in hair loss status according to general characteristics i

Division		Mean(M)	Standard Deviation (SD)	*t/F-value*	*p*
Age	20s	2.31[a]	.823	10.938***	.000
	30s	2.71[ab]	.818		
	40s	2.99[bc]	.832		
	50s	2.99[bc]	.785		
	60s or older	3.33[c]	.562		
Marital status	married	2.99	.778	4.652***	.000
	unmarried	2.54	.891		
Occupation	College students	2.11[a]	.786	8.696***	.000
	Sales/Service	3.14[b]	.742		
	Production/Technical	2.93[b]	.776		
	Officer/Management	2.90[b]	.806		

	Education/Professional	2.80[b]	.908		
	Other	2.84[b]	.833		
Stress level	Low	2.41[a]	.905	4.891**	.008
	Middle	2.84[b]	.818		
	High	2.92[b]	.837		
Exercise habits	Not exercising	2.90[b]	.828	5.199**	.002
	1-2 times per week	2.97[b]	.852		
	3-4 times per week	2.55[a]	.788		
	5 or more times per week	2.45[a]	.817		
Shampooing frequency	1-2 times a week	3.27	.524	1.300	.274
	Every two days	2.87	.731		
	Once a day	2.85	.867		
	Twice a day	2.73	.839		
Shampoo Type	General Purpose Shampoo	2.69[a]	.844	5.256**	.001
	Shampoos for hair loss	3.11[ab]	.818		
	Shampoos for scalp care	2.91[ab]	.772		
	Soap	3.21[b]	.886		
**p<.01, ***p<.001				Scheffe: a<b<c	

5. Differences in hair loss status according to eating habits of adult males

Table 06 shows the analysis results on differences in hair loss status according to eating habits of adult males. The analysis showed a statistically significant difference (p<.05) according to eating habits, and the progression of hair loss was relatively higher in the low-class group (M=2.94) compared to the high-class group (M=2.72), indicating that eating habits have a significant effect on hair loss and that a nutritionally balanced and correct diet is necessary to prevent hair loss. This finding is in line with recent studies showing that lifestyle factors such as sleep, alcohol, and smoking play an important role in hair loss and that a holistic approach to hair loss is needed as multiple factors affect the hair cycle [22][23].

Table 06: Differences in hair loss status according to eating habits

Division		Mean(M)	Standard Deviation (SD)	*t-value*	*p*
Eating habits	high-class group	2.72	.835	-2.252*	.025
	low-class group	2.94	.845		
Total		2.83	.845		
*p<.05					

V. CONCLUSION

In this study, those with good eating habits had relatively better hair loss status than those with poor eating habits. Furthermore, it was found that the old age, stress from job, high stress level, poore sleep quality, poore exercise habits were associated with worse hair loss condition. It is suggested that balanced eating habits, appropriate stress management, sleep in good quality, and consistent exercise habits are necessary for prevention of hair loss. It is expected that findings of this study can help recognizing the importance of eating habits and lifestyle in adult men for hair loss prevention and provide basic academic data for future research on healthy scalp and hair. Furthermore, since lifestyle and eating habits, which are closely related to hair loss, are modifiable factors that can be improved, it is expected that it can be used as a hair loss prevention resource for those who are concerned about the progression of hair loss.

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