Original Article :

Prevalence of female pattern hair loss in postmenopausal women in Saudi Arabia

Ghadeer Yahya A Almasabi[1], Razan Saleem M Alhumaidi[2], Noor Abdulkarim Alqurqush[3], Rizan Muaddi Alshehri[4], Turki Ahmad H Almansour[5], Ahmed Turki Aseeri[6], Abdullah S Algarni[7]

1. College of Medicine, Umm Al-Qura University, Al-Qunfudhah, Saudi Arabia.
2. College of Medicine, Taif University, Taif, Saudi Arabia.
3. College of Medicine, King Faisal University, Al Ahsa, Saudi Arabia.
4. College of Medicine, Umm Al-Qura University, Al-Qunfudhah, Saudi Arabia.
5. College of Medicine, King Saud bin Abdulaziz University for Health Sciences (KSAU-HS), Riyadh, Saudi Arabia.
6. College of Medicine ، King Khalid University, Abha, Saudi Arabia.
7. Department of Medicine, College of Medicine, University of Jeddah, Jeddah, Saudi Arabia.

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Corresponding author:

Ghadeer Yahya A Almasabi, College of Medicine, Umm Al-Qura University, Al-Qunfudhah, Saudi Arabia.
Email: ghadeer.almasabi@gmail.com.

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Abstract:

Background & Aims:
Female pattern hair loss (FPHL) is a common but frequently overlooked condition that affects postmenopausal women worldwide. It impacts both physical appearance and psychosocial well-being. This study examined the prevalence, risk factors, and psychosocial consequences of FPHL among postmenopausal women in
Saudi Arabia.

Methods:
A cross-sectional study was conducted from January to December 2025 using a self-administered online questionnaire to assess the prevalence of FPHL and associated factors among postmenopausal women from various regions of Saudi Arabia. Convenience sampling was used. Chi-square tests were used to examine the associations between categorical variables and the prevalence of hair loss among menopausal women. A p-value of <0.05 was considered statistically significant.

Results:
A total of 385 participants completed an online Arabic language questionnaire. 69.9% of the participants reported experiencing hair thinning or loss. Most noticed these changes within 1–2 years after menopause, with the frontal scalp predominantly affected. Early menopause (ages 40–45), chronic diseases (notably diabetes and hypertension), a positive family history, and high stress levels were significantly associated with increased hair loss prevalence ($p<0.05$). Despite these findings, only 30.1% of affected women sought medical advice, with many opting for natural remedies over medical treatments.
Additionally, FPHL was linked to reduced self-confidence and impaired social interactions, highlighting its substantial psychosocial burden.

Conclusion:
This study found that FPHL is highly prevalent among postmenopausal women in Saudi Arabia and is significantly associated with early menopause, chronic diseases, family history, and stress. These findings emphasize the need to raise awareness and encourage early intervention to improve outcomes for affected women.

Keywords:
Hair loss, alopecia, Menopause, Women, Prevalence, Saudi Arabia

Introduction:

Female pattern hair loss (FPHL), a subtype of androgenetic alopecia, is a common condition characterized by gradual hair thinning, but it is frequently an overlooked condition affecting postmenopausal women worldwide. Beyond physical changes, FPHL is associated with psychosocial distress, reduced self-esteem, and a significant impact on daily activities [1,2]. Globally, the prevalence of FPHL varies among older women, with differences observed based on ethnic background, hormonal variations, and environmental factors [3-6]. However, no recent studies in Saudi Arabia have investigated the prevalence of FPHL in postmenopausal women or its association with local risk factors such as early menopause, metabolic diseases, and cultural perceptions of aging.

Hormonal changes strongly influence the pathophysiology of FPHL during menopause. A decline in estrogen levels and an increase in androgens disrupt the normal hair follicle growth cycle, leading to progressive hair miniaturization and shedding [7]. Comorbidities such as diabetes (29.2%) and hypertension (55.3%), which are highly prevalent in Saudi women, may further contribute to scalp microvascular insufficiency, reducing blood

supply and nutrient availability to the hair follicles, thereby exacerbating FPHL[8-10]. Additionally, vitamin D deficiency, affecting nearly 34.8 % of Saudi women, has been associated with increased severity of hair loss, likely due to its role in regulating immune function and follicular health [3,11,12,13]. Research also indicates that obesity, commonly observed in postmenopausal women, may exacerbate hair loss by increasing systemic inflammation and altering hormonal pathways[14].

In Saudi Arabia, cultural and environmental factors may also aggravate hair loss prevalence. For instance, habitual head covering reduces sun exposure and can further contribute to vitamin D deficiency, potentially worsening hair follicle miniaturization and telogen effluvium[15]. Smoking has also been identified as a risk factor, as it accelerates oxidative stress in the scalp, leading to reduced hair regeneration capacity [16]. Despite these multiple contributing factors, only 35% of Saudi women with FPHL seek medical care, often due to cultural stigma, a lack of awareness, or the perception that hair loss is an inevitable part of aging [17]. The psychosocial impact of (FPHL) is significant, with studies reporting that up to 88% of affected women experience negative effects on daily life, 75% report decreased self-esteem, and 50% encounter social difficulties due to self-consciousness about hair thinning [18]. These statistics highlight the urgent need

for increased medical awareness, enhanced healthcare accessibility, and culturally adapted treatment approaches to address the burden of hair loss in Saudi Arabia effectively. This study aims to examine the prevalence, risk factors, and psychosocial consequences of FPHL in postmenopausal women in Saudi Arabia. By analyzing biological, cultural, and healthcare barriers, the findings could contribute to public health initiatives, improve dermatological awareness, and inform targeted treatment strategies. Ultimately, this research seeks to improve the quality of life for Saudi women affected by FPHL and encourage proactive medical interventions.

Methods:

This cross-sectional descriptive study was conducted in Saudi Arabia between January and December 2025, targeting Saudi postmenopausal women. The inclusion criteria were all Saudi postmenopausal women who provided informed consent to participate in the study. The exclusion criteria were individuals who did not provide informed consent, premenopausal women, women with known scalp conditions other than female pattern hair loss (e.g., alopecia areata, scarring alopecia), non-Saudi female residents, a history of chemotherapy or radiation therapy within the past 5 years, and current use of medications known to cause hair loss (e.g., certain antidepressants, anticoagulants). The required sample size was calculated to be 385 participants, based on the Raosoft sample size calculator, with a 5% margin of error and a 95% confidence interval. An online Arabic language questionnaire was designed by the authors using Google Forms. A pre-test was conducted before the main research to ensure its clarity, reliability, and validity.

The pre-test was carried out with 18 participants who were representative of the target population but were not included in the main study. The feedback obtained from the pilot study indicated that the questionnaire was clear, comprehensive, and well-understood by participants. No changes were deemed necessary, and the questionnaire was finalized in its original form for use in the main study. Participants received electronic links with a brief explanation of the study objectives and the target population and a request to participate voluntarily. The questionnaire included items to collect data about participants› demographic characteristics, medical history, hair loss assessment, lifestyle and environmental factors, and the impact of hair loss on quality of life. The study obtained ethical approval from the Jeddah University institutional research board, Saudi Arabia (Registration Number: HAP-02-J-094; Application Number: UJ-REC-307). The data analysis was conducted using IBM

SPSS Statistics version 27 (IBM SPSS Statistics for Windows, Armonk, NY: IBM Corp). Descriptive statistics, including frequencies and percentages, were used to summarize the study participants› demographic, health, and lifestyle characteristics. Chi-square tests (Pearson X^2) were used to examine the associations between categorical variables and the prevalence of hair loss among menopausal women. Exact probability tests were used for variables with minor expected frequencies. A p-value of <0.05 was considered statistically significant.

Results:

A total of 385 responses were collected from postmenopausal women in Saudi Arabia to assess the prevalence of hair loss.

Demographic and health characteristics of menopausal women in Saudi Arabia.

Among the menopausal women surveyed in Saudi Arabia, the largest proportion were from the Eastern Region (30.6%), followed by the Western (25.5%) and Central (21.3%) regions. Most participants were aged 45–50 years (31.9%), while those aged over 65 represented the smallest group (8.3%). The majority experienced menopause between the ages of 46 and 55 (68.3%), with fewer reporting menopause before 45 years (20.3%) or after 65 years (11.4%). Regarding health conditions, nearly half of the women (48.1%) reported no chronic diseases. Among those with comorbidities, diabetes mellitus (29.6%) and hypertension (29.1%) were the most common. Additionally, 61.8% of the participants were not taking any medications, while 38.2% reported current medication use. (Table 1).

Table1: Demographic and Health Characteristics of Menopausal Women in Saudi Arabia (N=385).

	Factors	No	%
Region	Central Region	82	21.3%
	Northern Region	5	1.3%
	Eastern Region	118	30.6%
	Western Region	98	25.5%
	Southern Region	82	21.3%
	45-50	123	31.9%
Age in years	51-55	79	20.5%
	56-60	86	22.3%
	61-65	65	16.9%
	> 65	32	8.3%
	Single	24	6.2%
Marital status	Married	306	79.5%
	Divorced / widow	55	14.3%
Educational level	Below secondary	47	12.2%
	Secondary education	113	29.4%
	University graduate	208	54.0%
	Post-graduate	17	4.4%
Employment	Unemployed	165	42.9%
	Employed	95	24.7%
	Retired	125	32.5%
Age at menopause	40-45	78	20.3%
	46-50	130	33.8%
	51-55	133	34.5%
	65+	44	11.4%
Chronic diseases	DM	114	29.6%
	HTN	112	29.1%
	PCOS	20	5.2%
	Thyroid disorders	46	11.9%
	Nothing	185	48.1%
Receive medications	Yes	147	38.2%
	No	238	61.8%

DM: diabetes mellitus, HTN: hypertension, PCOS: polycystic ovarian syndrome.

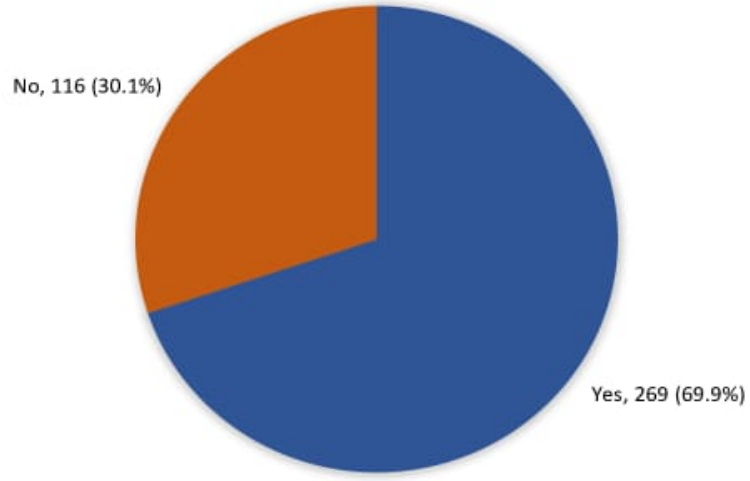


Figure 1. Prevalence of Hair Loss among Menopausal Women in Saudi Arabia (N=385)

Figure 1 illustrates the prevalence of hair loss among menopausal women in Saudi Arabia (N=385). The data reveal that most women (n=269, 69.9%) reported experiencing thinning or hair loss since menopause, while a smaller proportion (n=116, 30.1%) did not notice such changes .

Figure 1: Prevalence of Hair Loss Impact among Menopausal Women in Saudi Arabia (N = 385).

Patterns and Management of Hair Loss and Its Impact among Menopausal Women in Saudi Arabia

Among 269 menopausal women in Saudi Arabia who reported experiencing hair loss, the most common time of onset was within 1–2 years after menopause (45.4%), followed by 3–5 years (34.6%) and more than 5 years post-menopause (20.1%). The most frequently affected area was the front of the scalp (45.1%), followed by diffuse loss across the entire scalp (34.7%), the top of the scalp (34.0%), and the sides (13.8%). Percentages do not total 100% as many participants reported hair loss in multiple areas. Only 30.1% of the women consulted a healthcare professional regarding their hair loss, while the majority (69.9%) did not seek professional advice. Associated symptoms included itching (26.4%), flakes (18.2%), and pain (9.7%), while 58.7% reported no accompanying symptoms.

Hair loss affected self-confidence to varying degrees: 31.6% reported a slight impact, 29.4% reported a moderate impact, 13.0% reported a high impact, and 26.0% reported no effect. Regarding social relationships, 22.3% of women indicated that hair loss had an impact, whereas 77.7% did not perceive any effect. In terms of management, the majority of women (69.5%) did not use any treatment, while others opted for natural remedies (24.2%), minoxidil (8.9%), or hair transplantation (1.1%). (Table 2).

Table2: Patterns and Management of Hair Loss and Its Impact among Menopausa Women in Saudi Arabia (N=269).

Pattern	No	%
If yes, when did you first notice this?		
Within 1-2 years after menopause	122	%45.40
5-3years after menopause	93	%34.60
More than 5 years after menopause	54	%20.10
Where is hair loss most common?		
Front of the scalp	121	%45.10
All over the scalp	93	%34.70
The top of the scalp	91	%34.00
Both sides of the scalp	37	%13.80
Have you consulted a health professional about your hair loss?		
Yes	81	%30.10
No	188	%69.90
Are you experiencing any other symptoms associated with hair loss?		
Itching	71	%26.40
Flake	49	%18.20
Pain	26	%9.70
Nothing	158	%58.70
How has hair loss affected your self-confidence?		
No effect	70	%26.00
Slight effect	85	%31.60
Moderate effect	79	%29.40
High effect	35	%13.00
Do you feel that hair loss has affected your social relationships?		
Yes	60	%22.30
No	209	%77.70
Are you currently using any hair loss treatments?		
Nothing	187	%69.50
Natural treatments	65	%24.20
Minoxidil (Rogaine)	24	%8.90
Hair transplantation	3	%1.10

Association Between Demographic, Health Factors, and Hair Loss Among Menopausal Women in Saudi Arabia.

Among the 385 menopausal women included in the study, a significantly higher prevalence of hair loss was observed among those who experienced menopause between the ages of 40 and 45 (82.1%) compared to those who reached menopause at age 56 or older (56.8%) ($p = 0.025$). Women with chronic diseases were also more likely to report hair loss (76.5%) than those without such conditions (62.4%) ($p = 0.003$). Interestingly, participants not taking medications had a higher prevalence of hair loss (73.5%) compared to those on medications (63.9%) ($p = 0.046$). However, no significant associations were found for other demographic and health-related variables, including region, age, marital status, educational level, and employment status ($p > 0.05$). Despite the lack of statistical significance, some variations were noted—for instance, the highest hair loss prevalence was reported in the Eastern Region (76.3%) and the lowest in the Northern Region (40.0%). Women over 65 had the highest prevalence (84.4%) among age groups, while those aged 51–55 had the lowest (62.0%). Divorced or widowed women reported slightly more hair loss (78.2%) than married women (67.6%), and university graduates had a higher prevalence (71.2%) compared to those with less than secondary education (59.6%). (Table 3)

Table 3: Association Between Demographic, Health Factors, and Hair Loss Among Menopausal Women in Saudi Arabia.

Factors	Have you noticed thinning or hair loss since menopause?				p-value
	Yes		No		
	N	%	N	%	
Region					
Central Region	58	70.7%	24	29.3%	0.200^
Northern Region	2	40.0%	3	60.0%	
Eastern Region	90	76.3%	28	23.7%	
Western Region	63	64.3%	35	35.7%	
Southern Region	56	68.3%	26	31.7%	
Age in years					
45-50	83	67.5%	40	32.5%	0.163
51-55	49	62.0%	30	38.0%	
56-60	62	72.1%	24	27.9%	
61-65	48	73.8%	17	26.2%	
> 65	27	84.4%	5	15.6%	
Marital status					
Single	19	79.2%	5	20.8%	0.173
Married	207	67.6%	99	32.4%	
Divorced / widow	43	78.2%	12	21.8%	
Educational level					
Below secondary	28	59.6%	19	40.4%	0.439
Secondary education	81	71.7%	32	28.3%	
University graduate	148	71.2%	60	28.8%	
Post-graduate	12	70.6%	5	29.4%	
Employment					
Unemployed	113	68.5%	52	31.5%	0.686
Employed	65	68.4%	30	31.6%	
Retired	91	72.8%	34	27.2%	
Age at menopause					
40-45	64	82.1%	14	17.9%	
46-50	88	67.7%	42	32.3%	**0.025***
51-55	92	69.2%	41	30.8%	
56 or more	25	56.8%	19	43.2%	
Chronic diseases					
Yes	156	76.5%	48	23.5%	**0.003***
No	113	62.4%	68	37.6%	
Received medications					
Yes	94	63.9%	53	36.1%	**0.046***
No	175	73.5%	63	26.5%	

Association Between Lifestyle, Stress, Hair Care Practices, and Hair Loss Among Menopausal Women in Saudi Arabia.

Among menopausal women in Saudi Arabia, the prevalence of hair loss was significantly higher in those with a family history of hair loss (80.2%) compared to those without (62.4%) or those uncertain about their family history (66.7%) (p = 0.007). Stress levels were also significantly associated with hair loss, with the highest prevalence observed among women who reported feeling stressed "always" (83.6%) and the lowest among those who reported being stressed "rarely" (52.4%) (p = 0.002). In contrast, dietary patterns did not show a significant association with hair loss (p > 0.05); women consuming a carbohydrate- and fat-rich diet had a slightly higher prevalence (81.3%) compared to those with a balanced diet (68.2%) or irregular eating habits (68.4%). Similarly, the use of nutritional supplements—including multivitamins (71.0%), vitamin D (74.4%), and iron (63.3%)—did not appear to influence hair loss rates significantly. Hair care practices such as wearing a hijab (70.9% vs. 67.5% for non-hijab wearers), frequency of hair washing (73.8% for daily vs. 62.5% for less than once a week), and use of hair products (75.5% for no product use vs. 64.0% for oils/treatments) were not significantly associated with hair loss. (Table 4)

Table 4: Association Between Lifestyle, Stress, Hair Care Practices, and Hair Loss Among Menopausal Women in Saudi Arabia (N=385).

Risk factors	Have you noticed thinning or hair loss since menopause?				p-value
	Yes		No		
	N	%	N	%	
Do you have a family history of hair loss?					
Yes	101	80.2%	25	19.8%	**0.007***
No	68	62.4%	41	37.6%	
Not sure	100	66.7%	50	33.3%	
How would you describe your diet?					
Balanced (includes fruits, vegetables, proteins, and carbohydrates)	137	68.2%	64	31.8%	0.185^
Rich in carbohydrates and fats	39	81.3%	9	18.8%	
Irregular (including skipping some meals)	93	68.4%	43	31.6%	
Do you take any nutritional supplements?					
Multivitamins	98	71.0%	40	29.0%	0.242
Vitamin D	90	74.4%	31	25.6%	
Iron supplements	38	63.3%	22	36.7%	
Nothing	108	65.9%	56	34.1%	

How often do you feel stressed?					
Always	46	83.6%	9	16.4%	
Often	91	76.5%	28	23.5%	**0.002***
Sometimes	110	65.1%	59	34.9%	
Rarely	22	52.4%	20	47.6%	
Do you wear a hijab or cover your hair regularly?					
Yes	188	70.9%	77	29.1%	0.495
No	81	67.5%	39	32.5%	
How often do you wash your hair?					
Daily	59	73.8%	21	26.3%	
2-3 times/week	160	70.8%	66	29.2%	0.514^
1 time/week	45	63.4%	26	36.6%	
< 1 time/week	5	62.5%	3	37.5%	
Do you use any of the following hair care products?					
Thermal styling tools	82	66.7%	41	33.3%	
Hair oils or treatments	89	64.0%	50	36.0%	0.164
Hair dyes	127	69.0%	57	31.0%	
Nothing	74	75.5%	24	24.5%	

P: Pearson X2 test **^: Exact probability test**

*** P < 0.05 (significant)**

Discussion:

The findings of this study aimed to assess the prevalence and patterns of hair loss among menopausal women in Saudi Arabia. A significant proportion of women experienced menopause between 46 and 55 years, with smaller groups reporting menopause before 45 years or after 65 years. This aligns with global studies, such as the Study of Women's Health Across the Nation (SWAN). It identified the average age as approximately 52 years. It was influenced by lifestyle and environmental factors [19]. Early menopause has been linked to a higher risk of health complications, including hair loss. The sudden decline in estrogen levels is crucial for maintaining hair follicle health [20]. Chronic diseases were prevalent among participants, while nearly half reported no chronic conditions. These findings are consistent with previous research indicating that metabolic and cardiovascular conditions. This is associated with hormonal changes and aging[21]. Diabetes and hypertension can exacerbate hair loss by impairing blood circulation to the scalp [14]. The high prevalence of these conditions in our study may explain the observed association between chronic diseases and hair loss. The findings of this study also showed that a substantial majority of women reported experiencing thinning or

hair loss since menopause, while others did not notice such changes. This high prevalence aligns with global studies in the United States. Nearly 70% of menopausal women reported hair thinning or loss [22]. Another study by Chaikittisilpa et al [23] showed that hair loss among menopausal women was 52%. The timing of hair loss onset further highlights its connection to menopause, with a significant proportion of women noticing hair loss within 1-2 years after menopause. While others observed it 3-5 years post-menopause or even later. This pattern is consistent with research indicating that hormonal fluctuations during menopause[6,14,24].

The most common site of hair loss was the front of the scalp. It is followed by all over the scalp and the top of the scalp. This distribution is similar to findings from other studies[3]. Despite the high prevalence of hair loss, only a small percentage of women consulted a health professional advice. This could be attributed to cultural factors and lack of awareness. Similar trends have been observed in other Middle Eastern studies, where women often rely on home remedies[15]. A majority of women reported no associated symptoms, while others experienced itching, flaking, or pain. The absence of symptoms in many cases may contribute to the under-reporting and under-treatment of hair loss.

However, the presence of symptoms such as itching and flaking in some women suggests the potential involvement of scalp conditions, such as seborrheic dermatitis or inflammatory processes, which warrant further investigation[16]. When compared to global studies, our findings are consistent with the reported patterns of hair loss among menopausal women. For instance, a study in India found that a significant proportion of menopausal women experienced hair loss, with early menopause and nutritional deficiencies being key contributing factors[25]. Similarly, research in Western populations has highlighted the role of stress, hormonal changes, and chronic diseases in exacerbating hair loss during menopause[19]. However, regional differences in cultural practices may influence the prevalence and management of hair loss in different populations. Regarding the significant factors associated with hair loss among menopausal women, one of the most significant associations was between early menopause (40-45 years) and a higher prevalence of hair loss. Chronic diseases, particularly diabetes and hypertension, were significantly associated with hair loss. These conditions impair blood circulation and disrupt the hair growth cycle[14]. Women who don't receive medications

had a higher prevalence of hair loss. Hormone replacement therapy (HRT) may play a protective role in managing hair loss during menopause. Psychological and stress-related factors were also significant. Women with a family history of hair loss reported a higher prevalence[13]. Stress levels were a critical factor with women who reported feeling stressed "always" having the highest prevalence of hair loss. Stress disrupts the hair growth cycle and exacerbates hair loss [26]. Related to treatment practices, the majority of women were not using any treatments. There was only a small percentage opting for medical interventions like Minoxidil or hair transplantation. This suggests a potential gap in seeking medical advice. This reluctance to seek medical care may stem from cultural stigma, limited awareness, and the perception of hair loss as a cosmetic or age-related issue rather than a medical concern. In Saudi Arabia and other Middle Eastern societies, embarrassment, mistrust in treatment efficacy, and reliance on natural remedies are common barriers to seeking professional help (Chaikittisilpa et al., 2022). These factors may contribute to underutilization of dermatological care despite the significant psychosocial impact of FPHL (Hadshiew et al., 2004; Cartwright et al., 2009)[2,23,26]. Similar trends have been observed in other Middle Eastern studies where women often rely on natural remedies[15].

While this study provides valuable insights into the prevalence and factors associated with hair, it has some limitations. First, the cross-sectional design limits the ability to establish causal relationships between hair loss and the identified factors. Longitudinal studies are needed to better understand the temporal associations and longterm impacts of these factors. Second, the reliance on self-reported data for hair loss, symptoms, and lifestyle factors may introduce recall bias or inaccuracies. Objective measures could provide more reliable data. The study did not also explore the potential role of nutritional deficiencies. Future research should include a more comprehensive assessment of dietary. Despite these limitations, the study offers important insights into nutritional factors and the multifactorial nature of hair loss among menopausal women.

Conclusions:

This study found discovered that hair loss was very common in menopausal women and was closely associated with stress, chronic diseases, early menopause, and heredity. Most had hair loss on the frontal scalp within 1-2 years after menopause, however they tended to seek natural therapies instead of consulting a doctor.

Enhancing the availability of drugs like minoxidil and HRT, increasing awareness, and encouraging doctor consultations are all vital. Additional lifestyle, cultural, and dietary research may help develop tailored treatments. Resolving these issues can improve the quality of life and hair loss treatment for menopausal women.

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