

Knowledge, attitude, and practice of primary health physicians in Saudi Arabia in prescribing vitamins and minerals as treatment for hair loss

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ABSTRACT

Purpose/Background: Hair loss is a common presentation in primary care. This condition is caused by telogen effluvium and alopecia, among others. Several factors such as drugs, trauma, and emotional and physiological stress can lead to the development of hair loss in addition to vitamin and mineral deficiency. This study aimed to assess the knowledge and practice of primary health physicians in Saudi Arabia on the use of vitamins and minerals for the treatment of hair loss with the research question of what is the knowledge and practice level among primary physicians in Kingdom of Saudi Arabia regarding hair loss. **Methods:** This cross-sectional study was carried out in primary health care centers in Saudi Arabia. Data were collected by a self-administered online questionnaire. The questionnaire included two parts; the first one is the personal information such as age, sex, year of experience, and current medical ranking. The second part included questions assessing the knowledge and practice of using vitamins and minerals for treatment of hair loss. Data were analyzed by using Statistical Package for Social Sciences (SPSS). **Results:** A total of 146 physicians were included in the final analysis with a mean age of 41.65 (SD = 12.71). Slightly over half (54.1%) were juniors being general practitioners or residents. The mean knowledge score was 12.6 (SD = 2.83), and the mean practice score was 8 (SD = 3.43), with no difference between the total score between the senior and junior physicians, while some significant differences were noted in some items of both scores. No significant association was noted between knowledge and practice scores. **Conclusion:** The findings show the low scores of knowledge and practice among doctors about the causes and treatment of hair loss. Guidelines should guide practice regardless of seniority. Future studies should address each group separately.

Keywords: Alopecia, hair loss, knowledge, minerals, practice, telogen effluvium, vitamins

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Introduction

Hair loss is a common presentation in primary care. This condition is caused by telogen effluvium and alopecia among others. Several factors such as drugs, trauma, and emotional

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and physiological stress can lead to the development of hair loss in addition to vitamin and mineral deficiency. It is generally reversible. The prevalence of hair loss changes across countries with different genders and ages. It was reported to be more than 52% in women of menopausal ages and as low as 7% in ages less than 17 years.^[1] Saudi data shows the prevalence of telogen effluvium to be 5.2% which occurs more in females than males.^[2] The main causes of hair loss are usually deficiencies of vitamins or minerals such as iron/ferritin, vitamin D, Biotin, and zinc. Iron deficiency (ID) is considered one of the most common nutritional deficiencies in the world and is thought to cause hair loss, especially in women.^[3] Zinc is considered an essential nutrient, and studies have shown that zinc concentration has significantly decreased in all hair loss groups.^[4] Additionally, vitamins D and B7 (Biotin or Vitamin H) supplements were also shown to be associated with treating hair loss.^[5] Conflicting results have been reported in the literature on the effectiveness of trace elements supplementation in addressing hair loss.^[6]

Furthermore, little information is available about the understanding, attitudes, and practices of medical professionals especially primary care physicians, when it comes to prescribing vitamins and minerals as a treatment for hair loss. It is essential to comprehend these frontline healthcare personnel's viewpoints to maximize patient outcomes and care. It is crucial to address hair loss within the healthcare system in Saudi Arabia, as the country places a strong cultural emphasis on hair and the desire for an attractive appearance. The current study intends to explore Saudi Arabian primary health providers' knowledge, attitudes, and practices regarding the prescription of vitamins and minerals for the treatment of hair loss. This research aims to clarify the factors driving clinical decision-making in this environment and identify the potential for enhancing patient care by administering a thorough survey to a representative sample of physicians.

Methods

Study design

A descriptive cross-sectional study involving a self-administered questionnaire. Data collection took place over a period of 6 months starting January 2023.

Study setting

Primary care centers across the Kingdom of Saudi Arabia.

Target population

Primary health care physicians including internal medicine specialties, general practitioners, specialists, and clinical consultants.

Sample size

The sample was calculated based on the assumption that 60% of physicians would prescribe vitamins and minerals for hair loss.^[6] With a medium effect size of 0.3, a power of 95%, and an error of 0.05, the sample size was calculated to be 134 participants.

With 10% attrition due to incomplete data, a sample of 148 was calculated on G power.

Procedure

Ethical approval was secured from the King Fahad Medical City Ethical Committee with IRB-log no. 22-601E. A consent form was included in the data collection form identifying the objective of the study, the risk and benefit ratio, the duration of data collection, and an approval statement indicating participant approval when completing the questionnaire. A convenient sample of primary health care practitioners living and practicing in the Kingdom of Saudi Arabia was invited to participate through an electronic platform. Data were collected using a pretested and validated questionnaire addressing knowledge and practice about the prescription of vitamins and minerals for the treatment of hair loss. The questionnaire was administered in English. A detailed description of the questionnaire is below:

- a. Sociodemographic characteristics: This section included questions on the age, gender, specialty, and years of experience of the participants of the study
- b. Knowledge and practice of vitamin and mineral prescription: This section includes a total of 28 questions addressing knowledge and practice. The questions were retrieved from the literature following a comprehensive search of items addressing these constructs.^[6-8] The knowledge section includes 12 questions that assess the knowledge level of the participants about vitamin A, iron, biotin and zinc deficiency leading to hair fall disorders. The first seven questions are rated on a three-point Likert scale ranging between disagree (0) and agree (2). The rest of the questions range between Yes (2), Don't know (1), and No (0). The total knowledge score ranges between 0 and 36, with higher scores indicating higher knowledge. As for the practice construct, it is evaluated through 16 questions, with the first 15 addressing the practice of prescription of vitamins and minerals to treat hair fall disorders, with (1) indicating adequate practice and (0) indicating inadequate practice. The final question addresses the dosage and duration of the prescribed supplements and is not included in the final scoring. The total practice score ranges between 0 and 15, with higher scores addressing better practice.

Data analysis

Univariate data were presented as frequencies, percentages, means, and standard deviations according to their type. Group comparison was conducted between the senior and junior physicians using Chi-square, and mean comparison was made based on the normality of the variable. Additionally, another group comparison was conducted between those that prescribed and those who did not using the same analysis. Statistical significance was set for less than 0.05. Multiple regression analysis was conducted using the variables that were found to be significant at the bivariate level to establish predictors for knowledge. Data were entered into and analyzed using Statistical Package for Social Sciences (SPSS) version 24.

Results

Sociodemographic characteristics of the study participants

A total of 146 participants agreed to be a part of this study. The average age of the participants was 41.65 (SD = 112.71), with the majority being male participants (70.5%). Most of the physicians were general practitioners (32.9%) and specialists (24.7%). The average years of experience was 13.17 (SD = 9.99). A large number of these physicians worked at Governmental institutions, 82.9%, and Saudi in origin (70.5%). The highest percentage of participants were from the central region of the country (62.3%) then the western region (17.1%). More than two-thirds (69.9%) of the physicians reported seeing less than five patients with hair loss per week, while 18.5% reported seeing five to ten patients with this condition per week. The most commonly named hair fall disorder was alopecia areata (30.8%), while more (43.8%) reported "other hair fall disorder." When investigating the causes of this condition, 10.5% of the physicians evaluated the iron/ferritin, and 2.1% evaluated the folic acid levels. Details of sociodemographic and work-related factors are presented in Table 1.

Knowledge findings within the study participants

The mean knowledge score was 12.60 (SD = 2.83) reflecting a low-moderate score. The lowest scores were for those who agreed on the relationship between low serum level of vitamin A and hair loss ($n = 31$, 38%). However, the highest knowledge was seen in the relationship between ID and hair loss, where $n = 72$ (91.1%) agreed with this relationship. No difference was noted when comparing the knowledge of junior and senior doctors. However, when looking at the individual items, it was found that those who agreed with the relationship between hair loss and biotin level were significantly more seniors than juniors. The same significance was seen between those who disagreed on the relationship between folic acid and hair loss between juniors and seniors. The details of these findings are presented in Table 2.

Practice findings within the study participants

In terms of practice, the mean score was 8 (SD = 3.43). The lowest scores were for biotin and vitamin D prescription for the treatment of hair loss. The highest practice was for the prescription of vitamins and minerals in general for the treatment of hair loss disorders. The mean practice score was significantly similar in both senior and junior physicians. However, when looking at the individual items, it was noted that seniors were prescribed significantly more zinc for treating hair loss disorders in comparison to juniors. These details are presented in Table 3.

Relationship between knowledge and practice

When looking at the correlation between knowledge and practice, it was noted that it was a very mild negative relationship ($r = -0.041$; $P = 0.72$). However, this relationship was not found to be significant.

Table 1: Sociodemographic characteristics of the study participants (N=146)

Variables	Total (N=146, 100%)
Age*	41.65 (12.71)
Gender	
Female	43 (29.5)
Male	103 (70.5)
Title	
Consultant	31 (21.2)
General practitioner	48 (32.9)
Resident	31 (21.2)
Specialist	36 (24.7)
Years of experience*	13.17 (9.99)
Place of practice	
Government	121 (82.9)
Private	14 (9.6)
Both	11 (7.5)
Nationality	
Non-Saudi	43 (29.5)
Saudi	103 (70.5)
Region	
Central	91 (62.3)
Eastern	21 (8.2)
Northern	9 (6.2)
Southern	9 (6.2)
Western	25 (17.1)
Number of patients you see per week for hair loss	
10-15	11 (7.5)
5-10	27 (18.5)
Less than 5	102 (69.9)
More than 15	6 (4.1)
Which of the following conditions are commonly seen in your clinic	
Alopecia areata	45 (30.8)
Other hair fall disorder	64 (43.8)
Telogen effluvium	37 (25.3)
What other vitamins do you prescribe for hair loss?	
Multivitamins	5 (3.5)
Vitamin A	2 (1.4)
Vitamin B12	3 (2.1)
Vitamin C	1 (0.7)
Which mineral do you usually evaluate for hair loss?	
Iron/ferritin	15 (10.5)
Folic acid	3 (2.1)

*data presented in means and standard deviation.

Discussion

The aim of the current study was to evaluate the knowledge and practice levels of physicians in regard to hair loss disorders causes and treatments. This was evaluated through a cross-sectional approach involving a self-administered questionnaire to physicians of different seniority levels across five regions of the Saudi Kingdom. The main results showed low to average knowledge scores among the studied population. This contradicts the findings of previous studies which showed knowledge level about the link between vitamin and mineral supplementation and hair loss to exceed 70%.^[6] Although both samples were in the same setting, this difference could be due to the specialty of

Table 2: Knowledge presentation with comparison by seniority (N=146)

Variables	Total (N=146, 100%)	Juniors (n=79, 54.1%)	Seniors (n=67, 45.9%)	P
There is a relationship between Vitamin D deficiency and hair loss				
Agree	100 (68.5)	55 (69.6)	45 (67.2)	0.32
Disagree	30 (20.5)	18 (22.8)	12 (17.9)	
Don't know	16 (11)	6 (7.6)	10 (14.9)	
There is a relationship between iron level deficiency and hair loss				0.14
Agree	133 (91.1)	72 (91.1)	61 (91)	
Disagree	6 (4.1)	5 (6.3)	1 (1.5)	
Don't know	7 (4.8)	2 (2.5)	5 (7.5)	
There is a relationship between zinc deficiency and hair loss				0.05
Agree	119 (81.5)	65 (82.3)	54 (80.6)	
Disagree	19 (13)	7 (8.9)	12 (17.9)	
Don't know	8 (5.5)	7 (8.9)	1 (1.5)	
There is a relationship between biotin deficiency and hair loss				0.04**
Agree	91 (62.3)	53 (67.1)	38 (56.7)	
Disagree	39 (26.7)	22 (27.8)	17 (25.4)	
Don't know	16 (11)	4 (5.1)a	12 (17.9)b	
There is a relationship between Vitamin A deficiency and hair loss				0.55
Agree				
Disagree	74 (50.7)	43 (54.4)	31 (46.3)	
Don't know	40 (27.4)	19 (24.1)	21 (31.3)	
Disagree	15 (22.4)	17 (21.5)	15 (22.4)	
There is a relationship between folic acid deficiency and hair loss				0.03**
Agree	93 (63.7)	57 (72.2)a	36 (53.7)b	
Disagree	31 (21.2)	15 (19)	16 (23.9)	
Don't know	7 (8.9)	15 (22.4)a	7 (8.9)b	
Multivitamin tablets can help in hair loss treatment				0.29
Agree	105 (71.9)	61 (77.2)	44 (65.7)	
Disagree	17 (11.6)	7 (8.9)	10 (14.9)	
Don't know	24 (16.4)	11 (13.9)	13 (19.4)	
Are you aware of vitamin D toxicity?				0.75
No	31 (21.2)	16 (20.3)	15 (22.4)	
Yes*	115 (78.8)	63 (79.7)	52 (77.6)	
Are you aware of the symptoms of vitamin D toxicity?				0.29
No	41 (28.1)	25 (31.6)	16 (23.9)	
Yes*	105 (71.9)	54 (68.4)	51 (76.1)	
Is there a relationship between low serum level of vitamin A and hair loss?				0.93
I do not know	59 (40.4)	32 (40.5)	27 (40.3)	
No, there is no relationship	33 (22.6)	17 (21.5)	16 (23.9)	
Yes, there is a relationship*	54 (37.0)	30 (38)	24 (35.8)	
Is there a relationship between folic acid deficiency and hair loss?				0.02**
I do not know	40 (27.4)	26 (32.9)	14 (20.9)	
No, there is no relationship	28 (19.2)	9 (11.4)a	19 (28.4)b	
Yes, there is a relationship*	78 (53.4)	44 (55.7)	34 (50.7)	
Are you aware of the role of vitamin D and minerals in pathogenesis of hair fall disorders?				0.35
No, I am not aware	37 (25.3)	19 (24.1)	18 (26.9)	
Not sure	39 (26.7)	18 (22.8)	21 (31.3)	
Yes, I am aware *	70 (47.9)	42 (53.2)	28 (41.8)	
Total Knowledge score***	12.60 (2.83)	12.87 (2.40)	12.29 (3.25)	0.23

Juniors: residents and general practitioners; seniors: specialist and consultants; *: considered correct answer in scoring; **: significant for less than 0.05; ***: data presented in means and standard deviation

the knowledgeable physicians about the causes of hair loss, as they were clinically practicing dermatologists in comparison to less senior physicians in the current study.

Physicians' knowledge regarding iron deficiency/ vitamin D and hair loss

When looking further into the details of the knowledge items, it was noted that the majority was linked between ID

and hair loss, which is supported by the literature, which shows that women who had iron insufficiency often had hair loss.^[9] Additionally, it was noted that a large number was also associated between zinc deficiency and hair loss and that too was supported by the literature, which reported that patients having chronic conditions with extensive, prolonged, and resistant conditions to treatment where lower levels of zinc were linked to more severe hair loss.^[10,11] As for vitamin D, the

Table 3: Practice data with comparison by seniority (N=146)

Variables	Total (N=146, 100%)	Juniors Residents and GPs	Seniors Specialist and consultants	P
Do you prescribe vitamins and minerals to treat hair loss?				0.65
I don't prescribe	69 (47.3)	36 (45.6)	33 (49.3)	
Yes I prescribe	77 (52.7)	43 (54.4)	34 (50.7)	
Do you prescribe vitamin D for Telogen effluvium?				0.57
No	38 (26.0)	20 (46.5)	18 (52.9)	
Yes	39 (26.7)	23 (53.5)	16 (47.1)	
Do you prescribe vitamin D for Alopecia areata?				0.70
No	48 (32.9)	26 (60.5)	22 (64.7)	
Yes	29 (19.9)	17 (39.5)	12 (35.3)	
Do you prescribe vitamin D for other hair fall disorder?				0.06
No	34 (23.3)	15 (34.9)	19 (55.9)	
Yes	43 (29.5)	28 (65.1)	15 (44.1)	
Do you measure the serum level of vitamin D before prescribing it?				0.26
No	18 (12.3)	8 (18.6)	10 (29.4)	
Yes	59 (40.4)	35 (81.4)	24 (70.6)	
Do you prescribe other vitamins other than vitamin D for hair loss?				0.40
No	17 (11.6)	8 (18.6)	9 (26.5)	
Yes	60 (41.1)	35 (81.4)	25 (73.5)	
Do you prescribe Zinc for telogen effluvium?				0.04*
No	35 (24)	24 (55.8)	11 (32.4)	
Yes	42 (28.8)	19 (44.2)	23 (67.6)	
Do you prescribe Zinc for Alopecia areata?				0.95
No	45 (30.8)	25 (58.1)	20 (58.8)	
Yes	32 (21.9)	18 (41.9)	14 (41.2)	
Do you prescribe Zinc for other hair fall disorder?				0.23
No	33 (22.6)	21 (48.8)	12 (35.3)	
Yes	44 (30.1)	22 (51.2)	22 (64.7)	
Do you prescribe Biotin for telogen effluvium?				0.35
No	43 (29.5)	26 (60.5)	17 (50)	
Yes	34 (23.3)	17 (39.5)	17 (50)	
Do you prescribe Biotin for Alopecia areata?				0.70
No	48 (32.9)	26 (60.5)	22 (64.7)	
Yes	29 (19.9)	17 (39.5)	12 (35.3)	
Do you prescribe Biotin for other hair fall disorder?				0.68
No	36 (24.7)	21 (48.8)	15 (44.1)	
Yes	41 (28.1)	22 (51.2)	19 (55.9)	
Do you prescribe vitamin D and minerals as the only treatment for Hair Fall?				0.65
No	50 (34.2)	27 (62.8)	23 (67.6)	
Yes	27 (18.5)	16 (37.2)	11 (32.4)	
Do you measure the serum level of the minerals before prescribing them?				0.87
No	37 (25.3)	21 (48.8)	16 (47.1)	
Yes	40 (27.4)	22 (51.2)	18 (52.9)	
Do you prescribe the dose according to the Recommended Dietary Allowance (RDA) of vitamins and minerals?				0.75
No	100 (68.5)	55 (69.6)	45 (67.2)	
Yes	46 (31.5)	24 (30.4)	22 (32.8)	
How long do you often prescribe vitamins and minerals to the patient for hair loss (How long the course is)?				
1-3 months	44 (30.1)			
3-6 months	11 (7.5)			
Less than 1 months	20 (13.7)			
More than 6 months	2 (1.4)			
Total practice score*	8 (3.43)	8.32 (3.59)	8.35 (3.28)	0.97

majority (69.6%) believed in a relationship between it and hair loss, which is consistent with a systematic review stating that hair loss was associated with low serum 25-hydroxy vitamin D levels.^[12] Junior doctors were more likely to agree that both

biotin and folic acid had an effect on hair loss, which may be explained by the presence of more recent studies on the links, such as a 2017 study that showed that biotin deficiency caused hair loss.^[13]

Physicians practice regarding minerals/vitamins and hair loss

Regarding practice, biotin was one of the few items to be prescribed for hair loss, which is comparable to a web-based survey where it was found that 18.3% of dermatologists prescribed biotin.^[14] The most prescribed was vitamins and minerals in general for the treatment of hair loss disorders, which is a similar finding to a previous study that concluded that out of 144 dermatologists, 60% advised the use of vitamins and minerals to cure at least one type of hair loss, and were most commonly used for acute telogen effluvium (62%).^[6] Senior doctors prescribed zinc more often than junior doctors, which could be due to recent studies showing no link between zinc and hair loss^[15] whereas older studies showed that in those with hair loss, lower levels of zinc are seen.^[4,11] Surprisingly, among the vitamins and minerals, vitamin A and folic acid were the least prescribed accordingly. This is true despite the fact the high number of physicians believed that these deficiencies in these items were associated with hair loss. The controversy between knowledge and practice could be due to the inconsistent and/or inconclusive findings in the literature relating to folic deficiency and hair loss.^[16] This is also true for the vitamin A practice and knowledge since high doses of vitamin A (rather than deficiency) were reported to be associated with hair loss.^[5]

Study limitations

The study has some limitations that should be mentioned. Despite meeting the sample size calculation target, the sample size seemed small for a generalizable sample for the Saudi Kingdom. This is because of the large number of practicing physicians and the large land space. However, the distribution of the sample over the five regions of the country provided a good understanding of the knowledge and practice level among the study participants. Additionally, to better account for the different specialties and seniorities of the physicians, each category should be performed separately to understand why the true gap is present.

Conclusion

This study highlighted the knowledge and practice levels among practicing physicians in the Kingdom of Saudi Arabia with different seniority levels. The study pointed out the low to moderate knowledge level in the study sample despite the higher practice of vitamin and mineral prescription. This was seen in the dissociation between knowledge and practice in the analysis. Future studies should focus on different seniority levels and specialties of the physicians to gain a better understanding of their knowledge and practice levels.

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Conflicts of interest

There are no conflicts of interest.

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