



# The impact of diet and nutricosmetics on the condition of the skin, hair, and nails in women and men

## *Wpływ diety i nutrikosmetyków na stan skóry, włosów i paznokci u kobiet i mężczyzn*

### ABSTRACT

**Introduction:** Adverse changes in the skin and its appendages are associated with the aging process and depend on a diet, hydration, and the use of nutricosmetics.

**Objective:** This study aimed to analyze the opinions of women and men regarding the impact of food products and nutricosmetics on the condition of the skin, hair, and nails.

**Materials and methods:** A survey was conducted in 2025 at beauty salons among 40 women and 36 men. The respondents were grouped by age, gender, and body mass index.

**Results:** Nearly all respondents expressed the belief that diet and the use of nutricosmetics have a positive effect on the condition of their skin, hair, and nails.

**Conclusions:** The condition of the skin and its appendages is closely linked to nutrition. A proper, balanced diet has a significant impact on the health of the entire body.

**Keywords:** diet, skin, hair, nails, skin aging, nutricosmetics.

### STRESZCZENIE

**Wstęp:** Niekorzystne zmiany w skórze i jej przydatkach związane są z procesami starzenia i zależą od diety podstawowej, nawodnienia organizmu oraz stosowania nutrikosmetyków.

**Cel:** Celem pracy była analiza opinii kobiet i mężczyzn na temat wpływu produktów spożywczych oraz nutrikosmetyków na stan skóry, włosów i paznokci.

**Materiały i metody:** Ankiętę badawczą przeprowadzono w 2025 roku, w placówkach kosmetycznych wśród 40 kobiet i 36 mężczyzn. Respondentów podzielono według wieku, płci oraz wartości wskaźnika masy ciała.

**Wyniki:** Prawie wszyscy ankietowani wyrazili przekonanie o pozytywnym wpływie diety i stosowanych nutrikosmetyków na stan swojej skóry, włosów i paznokci.

**Wnioski:** Stan skóry i jej przydatków jest ściśle powiązany z odżywianiem. Prawidłowa, zbilansowana dieta ma istotny wpływ na zdrowie całego organizmu.

**Słowa kluczowe:** dieta, skóra, włosy, paznokcie, procesy starzenia skóry, nutrikosmetyki.

### INTRODUCTION

Daily diet and the use of nutricosmetics affect not only the body's overall health but also the condition of the skin, hair, and nails [1]. The impact of diet on skin condition was confirmed in a study conducted among women aged 45-94 [2]. Selected dietary components were assessed based on a questionnaire. At the same time, a professional computer-based skin

diagnostic analyser was used to determine skin structure, oiliness, degree of exfoliation, pore and vessel size, severity of discolouration, wrinkle depth, and hydration levels. In another study, attention was drawn to the need for a varied diet rich in fibre and antioxidants, as well as limiting saturated fats and simple sugars to maintain healthy skin, hair, and nails [3].



According to the authors of this study, a healthy appearance of the skin is ensured by a proper, balanced diet containing essential nutrients, such as protein, carbohydrates, and fats, as well as vitamins, minerals, and plant-based antioxidants in appropriate proportions. The daily diet may not always be sufficient to supply all the nutrients required for good health. For this reason, there is growing interest in nutricosmetics as supplements to the daily diet used in the care of the skin and its appendages. Nutricosmetics are oral supplements containing bioactive ingredients designed to improve the appearance and condition of the skin, hair, and nails through a comprehensive action from within the body [4].

### **Dietary macronutrients in maintaining the health of the skin, hair, and nails**

A balanced diet, including macronutrients such as proteins, carbohydrates, and fats, plays a key role in the proper functioning of the body, including the health of the skin, hair, and nails. To support skin health, it is advisable to follow a diet rich in fruits, vegetables, nuts, and legumes, while limiting the intake of simple sugars and saturated fats [5, 6].

Amino acids form the basis of all proteins, including the structural fibres of the skin, such as collagen, elastin, and keratin. Amino acids are essential for the skin's healthy structure and function, and they help the skin retain its firmness, suppleness, and resistance to injury [7].

An excess of simple sugars in the diet, such as glucose and fructose, can accelerate skin aging through excessive, uncontrolled protein glycation. Therefore, in this context, diet and glycation control are just as important as photoprotection [8-10].

Excessive consumption of saturated fats and trans isomers of unsaturated fatty acids has a detrimental effect on skin condition. Particularly dangerous for the body is the combination of fats containing trans isomers with a high-sugar diet, which exacerbates inflammation and promotes the development of metabolic syndrome, overweight, and obesity [11, 12]. Among fats containing essential fatty acids (EFAs), those containing omega-3 and omega-6 fatty acids in the form of natural cis isomers are recommended in the diet. Omega-3 and omega-6 fatty acids are those in which the first unsaturated bond, counted from the terminal methyl group, occurs at the 3rd or 6th carbon of the carbon chain. The most important examples of EFAs include linoleic acid (LA, omega-6), alpha-linolenic acid (ALA, omega-3), arachidonic acid (AA, omega-6), eicosapentaenoic acid (EPA, omega-3), omega-3), and docosahexaenoic acid (DHA, omega-3). The human body requires both omega-3 and omega-6 fatty acids in appropriate proportions. The most commonly recommended ratio of omega-6 to omega-3 fatty acids ranges from 1:1 to 4:1. Higher ratios may promote inflammation. EPA and DHA can be supplied by nutricosmetics. EFAs help improve the skin's hydrolipid barrier and reduce transepidermal water

loss (TEWL). They also help soothe skin inflammation and increase the skin's resistance to external factors. They have a positive effect on hair, improving its elasticity and strength, and on the nail plate, increasing its elasticity and reducing brittleness [13-18].

### **The importance of micronutrients in the diet for skin health and its appendages**

The dietary micronutrients and ingredients in anti-aging nutricosmetics that affect the condition of the skin, hair, and nails are primarily vitamins: C, B2, B3, B5, B6, B7, B9, A, D3, and E [19-29], trace elements that act as enzyme cofactors: zinc, selenium, copper, and iron [30-34], silicon [35], and plant antioxidants [36-39].

### **Plant antioxidants**

Foods contain a variety of plant antioxidants. These include polyphenols, mainly flavonoids: quercetin, epigallocatechin gallate, anthocyanins, hesperidin, naringenin, genistein, and daidzein. Polyphenols also contain phenolic acids: ferulic, caffeic, gallic, and rosmarinic acids. Additionally, there are carotenoids:  $\beta$ -carotene, lycopene, lutein, zeaxanthin, and astaxanthin; terpenoids: coenzyme Q10, saponins, and ginkgolides; alkaloids: caffeine and theobromine; and plant sulfur compounds: sulforaphane and allicin [40, 41].

### **AIM OF THE STUDY**

The study aimed to analyze the opinions of respondents (women and men) regarding the impact of food products and nutricosmetics on the condition of their skin, hair, and nails.

### **MATERIALS AND METHODS**

The study was conducted in 2025 at beauty salons in the Opole Province using a paper-based survey. A total of 76 respondents participated in the study, including 40 women and 36 men. The distribution of respondents by age group and body mass index (BMI) is presented in table 1. BMI was calculated as the ratio of body weight (kg) to the square of height (m<sup>2</sup>) based on the values provided in the questionnaire.

The largest group of respondents consisted of young people aged 16-25 (50%) and middle-aged people aged 26-60 (38%), while the smallest group involved older people over 60 (12%). Among all respondents, the majority were of normal weight with a BMI of 18.5-25 (54%) and overweight with a BMI over 25 (39%).

### **RESULTS**

The majority of women (57%) and men (72%) ranked it as good or very good, while 35% of women and 22% of men assessed their skin condition as average. The lowest percentage of respondents – 6% of men and 8% of women – rated their skin health as bad (Tab. 2). Underweight people (80%) and older adults over 60 (56%) assessed their skin condition as average,

whereas young people (ages 16-25) regarded it as the best. On the other hand, the majority of people with normal BMIs and overweight people (60% and 43%, respectively) thought their skin was in good condition (Tab. 2).

Most women (62%) and men (81%) described the condition of their hair as very good or good. The smallest number of respondents rated the condition of their hair as poor (10% of women and 11% of men) (Tab. 3). Older adults over 60 (45%) assessed their hair condition as bad, whereas those between the ages of 26 and 60 (83%) rated it as very good or good. Both individuals with a normal BMI and those who were overweight gave their hair a very high or good rating (71% and 63%, respectively). On the other hand, every underweight person gave their hair a positive rating (Tab. 3).

75% of men and 77% of women said their nails were in good or very good condition. The smallest percentage of responders (0-7%) thought their nails were in bad condition. 71-86% of respondents across all age categories said their nails were in very good or good condition. This also applied to individuals in all BMI categories (70-80%) (Tab. 4).

The most common diets for both men and women were a basic diet (67% of women and 56% of men) and a high-protein diet (12% of women and 28% of men). Men tended to follow the high-protein diet, whereas women preferred to follow the normal diet. Only a small percentage (0-7%) of other diets were chosen. The basic diet (89%) and low-fat diet (11%) were the most popular among those over 60, while underweight people also followed the standard diet (60%), a vegetarian diet, and a high-protein diet (20% each). The basic and high-protein diets were primarily followed by respondents who were of normal weight and overweight (Tab. 5).

Most respondents rated their diet positively in terms of health (95% of women and 94% of men). Respondents from all age groups (89-100%) and all BMI groups (90-100%) also valued their diet positively (Tab. 6).

Several respondents, including 68% of women and 44% of men, used nutricosmetics to support the condition of their skin, hair, and nails. Dietary supplements were consumed least frequently by people over 60 years of age (33%) and those who were overweight (47%) (Tab. 7).

Both women (19%) and men (26%) usually used nutricosmetics containing vitamin C, often combined with

vitamin A (9% and 21%, respectively) and collagen (13% of women, 12% of men). Men (32%) choose nutricosmetics with vitamins A, B, and E more often than women (23%), while women (17%) preferred those with minerals more frequently than men (6%). The lowest interest in the active ingredients of nutricosmetics (5 out of 11 ingredients) was observed among people over 60 years of age and among those who were

Tab. 1. Characteristics of respondents. Source: Own elaboration.

Characteristics	Number of respondents	Percentage [%]
Women	40	53
Men	36	47
Ages 16-25	38	50
Age 26-60	29	38
Age over 60	9	12
Underweight (BMI below 18.5)	5	7
Normal weight (BMI between 18.5 and 25)	41	54
Overweight (BMI over 25)	30	39

Tab. 2. Assessment of skin condition in women (W) and men (M) by age and BMI. Source: Own elaboration.

Assessment	Responses [%]							
	F	M	Age [years]			BMI		
			16-25	26-60	>60	<18.5	18.5-25.0	>25.0
Very good	7	25	13	24	0	0	12	23
Good	50	47	55	52	33	20	60	43
Average	35	22	26	17	56	80	24	27
Bad	8	6	6	7	11	0	4	7

Tab. 3. Assessment of hair condition in women (W) and men (M) by age and BMI. Source: Own elaboration.

Assessment	Responses [%]							
	F	M	Age [years]			BMI		
			16-25	26-60	>60	<18.5	18.5-25.0	>25.0
Very good	22	36	32	38	0	40	29	27
Good	40	45	37	45	33	0	42	36
Average	28	8	28	10	22	60	24	20
Bad	10	11	3	7	45	0	5	17

Tab. 4. Assessment of the condition of nails in women (W) and men (M) by age and BMI. Source: Own elaboration.

Assessment	Responses [%]							
	F	M	Age [years]			BMI		
			16-25	26-60	>60	<18.5	18.5-25.0	>25.0
Very good	28	36	21	41	45	0	39	27
Good	49	39	50	45	22	80	39	43
Average	18	25	24	14	33	20	22	23
Bad	5	0	5	0	0	0	0	7

underweight (6 out of 11 ingredients) (Tab. 8).

31% of women and 53% of men had been using nutricosmetics for over a year, while all underweight individuals had been taking them for less than a year (Tab. 9).

Respondents also provided their own subjective assessment of the impact of the nutricosmetics they used on the condition of their skin, hair, and nails. An improvement was noted by 100% of men and 81% of women. Only 19% of women did not notice any development in the condition of their skin and its appendages. The improvement was confirmed by all individuals over 60 years of age (100%) and the majority of overweight respondents (92%) (Tab. 10).

The vast majority of women and men (98%) expressed the belief that diet and the use of nutricosmetics had a positive effect on the condition of their skin, hair, and nails. Respondents from all age groups (88-100%) and those who were underweight, of normal weight, and overweight (97-100%), expressed similar views (Tab. 11).

## DISCUSSION

The severity of adverse changes in the skin and its appendages is associated with the aging process and depends to a large extent on the diet, which, in addition to macronutrients, also includes micronutrients such as vitamins, minerals, and antioxidants, including those found in nutricosmetics. Some adverse changes in the skin are associated with excessive glycation of proteins, including collagen and elastin. This occurs when a diet high in simple sugars is consumed [8-10]. The course of skin aging and the aging of its appendages is primarily influenced by a diet rich in vitamins, micronutrients, and antioxidants, which can slow down these processes. Adequate hydration of the body is also important [2, 3]. This study aimed to assess the impact of diet on the condition of the skin, hair, and nails. A survey was conducted among 40 women and 36 men, divided into age

**Tab. 5.** Types of diets followed by women (W) and men (M) in different age groups and BMI groups.  
**Source:** authors' own analysis.

Type of diet	Responses [%]							
	F	M	Age [years]			BMI		
			16-25	26-60	>60	<18.5	18.5-25.0	>25.0
Basic	67	56	74	38	89	60	59	63
Vegetarian	5	3	5	7	0	20	5	0
High-protein	12	28	16	28	0	20	20	20
Low-protein	0	5	0	7	0	0	2	3
Low-fat	3	3	0	3	11	0	2	3
Low-carbohydrate	3	5	0	11	0	0	2	8
Low-energy	7	0	5	3	0	0	8	3
Other	3	0	0	3	0	0	2	0

**Tab. 6.** Subjective assessment of the diet by women (W) and men (M) and respondents in different age and BMI groups.  
**Source:** Own elaboration.

Assessment of the current diet	Responses [%]							
	F	M	Age [years]			BMI		
			16-25	26-60	>60	<18.5	18.5-25.0	>25.0
Very healthy	10	14	5	24	0	0	17	7
Fairly healthy	45	44	47	48	22	60	42	46
Average	40	36	40	28	67	40	39	37
Rather unhealthy	5	6	8	0	11	0	2	10

**Tab. 7.** Number of women (W) and men (M), and individuals from various age groups and BMI categories using nutricosmetics.  
**Source:** Own elaboration.

Use of nutricosmetics	Responses (%)							
	F	M	Age [years]			BMI		
			16-25	26-60	>60	<18.5	18.5-25.0	>25.0
Yes	68	44	53	69	33	60	56	47
No	32	56	47	31	67	40	44	53

**Tab. 8.** Active ingredients of nutricosmetics used by respondents from different age groups and BMI categories.  
**Source:** Own elaboration.

Active ingredients of nutricosmetics	Responses [%]							
	K	M	Age [years]			BMI		
			16-25	26-60	>60	<18.5	18.5-25.0	>25.0
Collagen	13	12	13	14	0	0	15	12
Isoflavones	2	0	0	1	0	0	1	0
Biotin	11	6	10	9	0	13	8	10
Other B vitamins	7	4	8	5	0	0	4	10
Omega-3 fatty acids	13	10	15	9	14	24	8	17
Vitamin C	19	26	23	22	14	13	24	21
Vitamin E	7	7	4	8	14	13	8	2
Vitamin A	9	21	8	17	29	24	12	14
Antioxidants	4	2	4	3	0	13	3	2
Minerals	17	6	13	11	29	0	16	10
Other	0	4	2	1	0	0	1	2

**Tab. 9.** Duration of nutricosmetic use among female (F) and male (M) participants, as well as among respondents in different age and BMI groups. **Source:** Own elaboration.

Duration of nutricosmetic intake	Responses [%]							
	F	M	Age [years]			BMI		
			16–25	26–60	>60	<18.5	18.5–25.0	>25.0
Less than 3 months	35	7	32	20	0	25	29	15
3–6 months	19	20	21	16	33	50	17	15
7–12 months	15	20	5	32	0	25	21	8
Over a year	31	53	42	32	67	0	33	62

**Tab. 10.** Subjective assessment of the effects of nutricosmetics by female (F) and male (M) participants, as well as individuals from different age groups and BMI categories. **Source:** Own elaboration.

Assessment of the effect of the nutricosmetics used	Responses [%]							
	F	M	Age [years]			BMI		
			16–25	25–60	>60	<18.5	18.5–25.0	>25.0
Positive	81	100	79	95	100	75	88	92
Negative	19	0	21	5	0	25	12	8

**Tab. 11.** Subjective opinion on the impact of diet and nutricosmetics on the condition of skin, hair, and nails, as expressed by surveyed women (W) and men (M) and by respondents from different age groups and BMI categories: D – underweight, E – normal weight, F – overweight. **Source:** Own elaboration.

Opinion on the impact of diet and nutricosmetics on the condition of skin, hair, and nails	Responses [%]							
	W	M	Age [years]			BMI		
			16–25	26–60	>60	D	E	F
Strongly positive	53	55	45	69	44	80	54	50
Mostly positive	45	43	53	31	44	20	44	47
Somewhat negative	2	0	0	0	12	0	0	3
Strongly negative	0	0	0	0	0	0	0	0
No opinion	0	2	2	0	0	0	2	0

groups and categorized by BMI, specifically underweight, normal weight, and overweight individuals. Most women and men self-assessed the condition of their skin, hair, and nails as good or very good, and the condition of their hair and nails as good. At the same time, all respondents rated their diet positively in terms of health. Respondents most frequently followed a standard diet. Other types of diets, such as vegetarian, vegan, low-protein, low-fat, and low-calorie, were followed to a lesser extent, and the type depended on age and BMI. This indicated that the majority of respondents followed a balanced basic diet that provided the body with essential nutrients, vitamins, minerals, antioxidants, and omega-3 polyunsaturated fatty acids, which contributed to the good condition of the skin and its appendages. This is also confirmed by other authors [40, 41]. Most of the respondents used nutricosmetics to support the health of their skin, hair, and nails in addition to their regular diet. These preparations mostly contained minerals, vitamins, collagen, and omega-3

polyunsaturated fatty acids. People over 60 years of age used nutricosmetics the least frequently. All men and the majority of women confirmed the positive effect of nutricosmetics on the condition of their skin and its appendages, which was also observed in other studies. [4]. The vast majority of both women and men expressed the belief that their diet and the use of nutricosmetics had a positive effect on the condition of their skin, hair, and nails.

## CONCLUSIONS AND SUMMARY

The condition of the skin, hair, and nails is closely linked to the overall health of the body. A proper, balanced diet containing proteins, carbohydrates, and fats, as well as vitamins, minerals, and antioxidants, and low in saturated fats and simple sugars, contributes to the good condition of the skin and its appendages. Confirming this statement was the aim of this study, which involved conducting a survey among women and men of various age groups and with differing BMI. Respondents independently assessed the impact of their diet and nutricosmetics on the condition of their skin and its appendages. The respondents' individual subjective assessment was based on observations of the intensity of skin oiliness and flakiness, the size of pores and capillaries, discoloration, and the depth of wrinkles. About hair, the intensity

of hair loss, brittleness, and shine were assessed, while for nails, the ease of damage, color, smoothness, and shine were taken into account.

Based on the analysis of respondents' answers, it was found that:

1. Most of the surveyed women and men rated the condition of their skin, hair, and nails as very good or good, and nearly all respondents rated their diet positively in terms of health.
2. The vast majority of respondents followed a balanced basic diet and a high-protein diet, providing the body with essential macronutrients, micronutrients, and omega-3 fatty acids. The exception was the age group of people over 60, who, in addition to the basic diet, also followed a low-fat diet.
3. Nutricosmetics containing mainly vitamins, collagen, omega-3 fatty acids, and minerals were used more frequently by women than by men. Conversely, people over

the age of 60 used these types of supplements the least often.

4. Among those using nutricosmetics, all men and the vast majority of women gave a positive assessment of their impact on the condition of their skin, hair, and nails.
5. Nearly all respondents expressed the belief that diet and nutricosmetics have a positive effect on the condition of their skin, hair, and nails.

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