

# Cosmetology students' knowledge about vitiligo

## *Ocena wiedzy studentów kosmetologii na temat bielactwa*

Daria Kopacz, Małgorzata A. Czarny-Działak

Institute of Health Sciences, *Collegium Medicum*, Jan Kochanowski University, Kielce, Poland  
Head of the Institute: Prof. Edyta Suliga PhD

Medical Studies/Studia Medyczne 2022; 38 (3): 190–198  
DOI: <https://doi.org/10.5114/ms.2022.119917>

**Key words:** vitiligo, melanocyte function defect, immunological defect.

**Słowa kluczowe:** bielactwo, defekt funkcji melanocytów, zaburzenia immunologiczne.

### Abstract

**Introduction:** Knowledge of various dermatological conditions, including rare ones, is extremely important in the work of a cosmetologist. People working in this profession should constantly expand their knowledge in this area. One of the dermatological disorders is vitiligo. Approximately 60% of patients with vitiligo experience depressive symptoms as a result of their disease. Vitiligo lesions can contribute to isolation and stigmatization of patients. A cosmetologist with detailed knowledge of vitiligo can, for example, in cooperation with a dermatologist, contribute to improving the patient's health, self-esteem, and self-confidence.

**Aim of the research:** To investigate the knowledge of cosmetology students about vitiligo.

**Material and methods:** A proprietary, anonymous survey questionnaire was created for the purpose of the study. It consisted of 22 questions, the main objective of which was to check the knowledge of cosmetology students of Jan Kochanowski University on vitiligo, it was printed and distributed in paper form. All complete questionnaires were analysed using Excel. The survey was conducted among 96 students of Jan Kochanowski University in Kielce.

**Results:** The average score obtained by the respondents was 44.67%, while the arithmetic mean of the points obtained was 7.59 out of 17 possible. Students of cosmetology at Jan Kochanowski University demonstrated general knowledge about vitiligo, allowing for the diagnosis of vitiligo and advice on skin care. Among the surveyed bachelor's degree students of cosmetology, the greatest knowledge of vitiligo was observed among the third-year students. The professionally active students showed more practical knowledge than the students who had not yet started work.

**Conclusions:** It is advisable for students of cosmetology at Jan Kochanowski University in Kielce to broaden their knowledge on the following: methods of vitiligo treatment, the typical location of vitiligo lesions, and cosmetic procedures that may contribute to the formation of new vitiligo spots.

### Streszczenie

**Wprowadzenie:** Posiadanie wiedzy na temat różnych schorzeń dermatologicznych, także tych rzadkich, jest niezwykle ważne w pracy kosmetyka. Około 60% pacjentów z bielactwem doświadcza stanów depresyjnych, spowodowanych swoją chorobą. Zmiany bielacze mogą przyczyniać się do izolacji i stygmatyzacji chorych.

**Cel pracy:** Ocena stanu wiedzy studentek kosmetologii na temat bielactwa.

**Materiał i metody:** Na potrzeby badania został stworzony autorski, anonimowy kwestionariusz w formie ankiety. Składał się on z 22 pytań, których głównym celem było sprawdzenie stanu wiedzy studentek kosmetologii Uniwersytetu Jana Kochanowskiego na temat bielactwa. Został on wydrukowany i dystrybuowany w formie papierowej. Wszystkie kompletne ankiety poddano analizie przy wykorzystaniu programu Excel. Przeprowadzono ankietę wśród 96 studentek Uniwersytetu Jana Kochanowskiego w Kielcach.

**Wyniki:** Średni wynik uzyskany przez ankietowane wyniósł 44,67%, natomiast średnia arytmetyczna otrzymanych punktów wynosiła 7,59 na 17 możliwych do uzyskania. Studentki kosmetologii Uniwersytetu Jan Kochanowskiego wykazały się ogólną wiedzą na temat bielactwa, pozwalającą na rozpoznanie bielactwa i doradztwo w zakresie pielęgnacji skóry zmienionej chorobowo. Wśród ankietowanych studentek studiów I stopnia na kierunku kosmetologia największą wiedzę na temat bielactwa mają studentki trzeciego roku. Studentki pracujące wykazały się większą wiedzą praktyczną od studentek, które jeszcze nie podjęły pracy.

**Wnioski:** Wskazane jest, aby studentki kosmetologii Uniwersytetu Jana Kochanowskiego w Kielcach poszerzyły swoją wiedzę na temat metod leczenia bielactwa, typowej lokalizacji zmian bielacznych i zabiegów kosmetycznych, które mogą przyczynić się do powstawania nowych plam bielacznych.

## Introduction

Vitiligo is a dermatological disease associated with a defect in melanocytes, manifested by the appearance of white pigmentless patches on the skin [1]. Pawulczuk reports that it occurs in 0.5% to 4% of the population [2, 3]. White patches are usually a few to several centimetres long, they may merge with each other, and cover large areas of the skin [1, 4]. Typical localizations of the lesions are extremities (especially at joint junctions), backs of hands, backs of feet, neck, axillae, nipples, head, and skin around natural body orifices. Discoloration may also occur on mucous membranes, genitalia, or hair [5]. Vitiligo usually develops in childhood or in young adults, with 25% of cases occurring in children before the age of 10 years (most commonly between 4 and 8 years of age). By the age of 20 years, 50% of people are affected, with the likelihood decreasing with age. The familial occurrence of vitiligo is approximately 30% [3, 6]. In general, vitiligo can be divided into congenital vitiligo (albinism) and acquired vitiligo. Congenital vitiligo is practically untreatable, whereas acquired vitiligo responds differently to treatment but is rarely completely reversible. Clinically, both types can be divided into segmental and non-segmental varieties. Segmental vitiligo is limited to the midline of the body – the lesions are arranged along the Blaschko line and usually do not cross it. In generalized vitiligo, discoloration occurs in multiple locations on the body, on both sides, and depigmentation usually progresses over time. The non-segmental type of vitiligo includes several subtypes: focal form, generalized form, and total vitiligo. Generalized congenital vitiligo is caused by a lack of the enzyme tyrosinase, which is involved in the metabolic pathway leading to melanin formation [2]. The aetiopathogenesis of acquired vitiligo is not well understood. There are several theories explaining the causes of melanocyte destruction or impairment of their function. The best known are the following: autoimmune theory, autocytotoxic theory, neurogenic theory, and genetic theory. Contemporary methods of treatment of vitiligo include the following: phototherapy (methods: PUVA, PUVA sol, KUVA, UV + St. John's wort extract, therapy with calcipotriol + UV or calcipotriol + PUVA, therapy with NB-UVB), corticosteroid therapy, topical calcineurin inhibitors, surgical excision of lesions, skin and epidermal grafts, cryotherapy, depigmentation, laser therapy, and treatment with phenylalanine. Other methods, whose effectiveness has not been fully documented, are also used in the treatment of vitiligo. They can be applied in combination with proven methods but should not be the only form of treatment. These methods include the following: TCA peeling, extracts from human placenta, creams with modified catalase, preparations with common antioxidants (e.g. vitamin B<sub>12</sub>, vitamin C, vitamin E), catalase-containing gel, preparations with cysteine and tyrosine, superox-

ide dismutase, polyunsaturated fatty acids (omega-3, omega-6 and omega-9 acids), golden fern (*Phlebodium aureum*) and ginkgo biloba extracts, and beta-carotene. For the patient, masking the lesions is as important as treatment. Methods used in cosmetology offices are often cheaper and therefore more available to a larger group of patients. These include temporary cosmetic camouflage (self-tanning filters – camouflage fluids are used for this purpose) and permanent cosmetic camouflage (which involves micropigmentation of a tattoo) [7–10]. Skin with vitiligo lesions is very delicate and prone to irritation. It requires appropriate care. People with vitiligo should apply sunscreen with SPF at least 30 before each sun exposure to avoid sunburn. Preparations should be applied every 2 h, even if the day is cloudy [11]. It is also possible to use cosmetics that mask the spots on the skin. Their composition is very important. The preparations should contain antioxidant and anti-inflammatory components. It is worth looking for special lines of cosmetics dedicated to vitiligo skin. However, one should not use a solarium because it can lead to skin burns. Treatment of this disease rarely leads to complete elimination of symptoms. Therefore, it is worth educating patients that there are possibilities of masking the changes with the help of professional cosmetics dedicated to skin with vitiligo lesions [12, 13].

## Aim of the research

The purpose of this study was to investigate the knowledge of cosmetology students about vitiligo.

## Material and methods

To conduct the study, an original, anonymous survey questionnaire was created. It consisted of 22 questions, the main purpose of which was to check the knowledge of cosmetology students of Jan Kochanowski University on vitiligo. The first part of the questionnaire concerned demographic data: age, place of residence, mode of study, year of study, and work in a cosmetic/cosmetology salon. The level of knowledge was tested by questions included in the second part: 17 of them were closed tasks in which one correct answer had to be indicated (tasks 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 18, 19), in one task several answers had to be indicated (task 17), 3 tasks were semi-open (tasks 20, 21, 22), and one task was an open task (task 13). The consent of the institute's director was obtained to conduct an anonymous survey among the students of Jan Kochanowski University in Kielce. The questionnaire was printed and distributed in paper form. This method was used to conduct the survey among a large number of respondents and encourage them to fill in the questionnaire reliably. Moreover, it guaranteed that the group of respondents included only those to whom the survey was addressed. All complete survey questionnaires were analysed using Excel.

**Table 1.** Main statistical indicators for the closed tasks of the survey questionnaire

Highest score	17
Lowest score	2
Median	8
Dominant	7
Ease of testing	0.45
Arithmetic mean	7.59
Average score in percent	44.67%
Standard deviation	2.17
Standard deviation of population	2.16

**Table 2.** Comparison of the main statistical indicators for the closed tasks of the questionnaire obtained by the surveyed students from each year of study

Parameter	Year 1	Year 2	Year 3
Highest score	11	10	17
Lowest score	3	2	3
Median	7	7	8
Dominant	7	7	8
Ease of testing	0.42	0.40	0.50
Arithmetic mean	7.20	6.79	8.54
Average percentage score	42.35%	39.94%	50.24%
Standard deviation	1.81	1.95	2.29
Standard deviation of population	1.78	1.92	2.26

**Table 3.** Assignment of tasks to difficulty levels - total results of respondents

Categories of tasks	Range of values of the easiness coefficient	Task numbers
Very difficult	0.00–0.19	16, 14, 12
Difficult	0.20–0.49	10, 9, 5, 11, 18, 7, 2
Moderately difficult	0.50–0.69	6, 4, 3
Easy	0.70–0.89	1, 19, 8, 15
Very easy	0.90–1.00	0

## Results

### Closed tasks results

Based on the above data, the respondents from the third year of study performed best with the closed tasks, followed by those from the first year. The worst results were achieved by second-year students.

Based on the obtained coefficients of ease, the tasks were divided into 5 categories: very easy, easy, moderately difficult, difficult, and very difficult.

After summing up the results for the whole study population, 3 tasks turned out to be very difficult: methods of vitiligo treatment, percentage of patients suffering from this disease, and treatments not indicated in sick people. Seven tasks were classified as difficult: indication of the typical locations of vitiligo lesions, explanation of what Koebner's symptom is, indication of the enzyme, identifying whose deficiency prevents the production of melanin, disorders associated with vitiligo, causes of vitiligo lesions, the type of cosmetics which may contribute to the formation of new vitiligo lesions, and varieties of vitiligo. Three tasks were moderately difficult: indicating the prognosis of vitiligo, establishing a correlation between vitiligo and other diseases, and indicating the period of life in which the disease usually develops. They required the following: indicate the main symptom of vitiligo, know that vitiligo can be part of a whole disease syndrome, identify whether patients can have spontaneous re-pigmentation, and indicate the cosmetics that play a key role in the care of vitiligo skin. None of the tasks in the questionnaire was classified as very easy.

### Results of the semi-open and multiple-choice tasks of the survey questionnaire – analysis of results by year of study

Task 13. The first of the semi-open tasks was task 13, in which the respondent had to indicate the most commonly used method of treatment of vitiligo.

#### Comparison of the results obtained with regard to the year of study of the students

The responses obtained from students in each year of study are shown in Table 4.

The most common answer among first-year students was "I don't know". Only 1 (3.33%) respondent answered that different types of irradiation were the most commonly used treatment method. Among the second-year respondents, also the most common answer was "I don't know" (89.66%), and 3 respondents indicated UVB radiation as the most commonly used method of vitiligo treatment. Third-year students gave the most suggestions for vitiligo treatment. Twelve of them answered "I don't know" (32.43%), 10 persons indicated PUVA (27.03%), 8 persons provided a rather general answer "different kinds of irradiation" (21.62%), 5 thought it was narrow-wave UVB (13.51%), and 2 indicated corticosteroids (5.41%).

Task 17. In task 17, the participants were asked to indicate cosmetic/cosmetological procedures the use of which can have a beneficial effect on the health/appearance/well-being of people with vitiligo. This was a multiple-choice task. Thus, the respondents could indicate several answers. There were 8 options

**Table 4.** Students' responses to a question about the most commonly used treatment method for vitiligo

Obtained answers	Year 1		Year 2		Year 3	
	Number of answers	Percentage of answers	Number of answers	Percentage of answers	Number of answers	Percentage of answers
I don't know	29	96.67	26	89.66	12	32.43
Different types of irradiation	1	3.33	0	0	8	21.62
UVB/narrow-wave UVB	0	0	3	10.34	5	13.51
PUVA	0	0	0	0	10	27.03
Corticosteroids	0	0	0	0	2	5.41

**Table 5.** Number of treatments indicated by all surveyed students combined

Number of treatments suggested	1	2	3	4	5	6	7
Number of people	10	16	17	28	8	8	9
Percentage	10.42	16.67	17.71	29.17	8.33	8.33	9.38

**Table 6.** Cosmetic/cosmetological procedures that can have a beneficial effect on the health/appearance/well-being of vitiligo patients – results of all surveyed students combined

Variable	Year 1		Year 2		Year 3		Total	
	Number of persons	Percentage	Number of persons	Percentage	Number of persons	Percentage	Number of persons	Percentage
Massages	15	50.00	19	65.52	30	81.08	64	66.67
Masks	19	63.33	20	68.97	29	78.38	68	70.83
Permanent makeup	9	30.00	17	58.62	24	64.86	50	52.08
Laser treatments	7	23.33	6	20.69	19	51.35	32	33.33
Henna	11	36.67	17	58.62	26	70.27	54	56.25
AHA acids	5	16.67	3	10.34	17	45.95	25	26.04
Ultrasound	17	56.67	17	58.62	29	78.38	63	65.63

**Table 7.** Are there any cosmetics dedicated to vitiligo sufferers? Answers of the respondents

Variable	Year 1		Year 2		Year 3		Total	
	Number of answers	Percentage of answers	Number of answers	Percentage of answers	Number of answers	Percentage of answers	Number of answers	Percentage of answers
No	2	6.67	1	3.45	1	2.70	4	4.17
Yes – the example provided	0	0.00	4	13.79	28	75.68	32	33.33
I think so, but I can't provide an example	28	93.33	24	82.76	8	21.62	60	62.50

to choose from: massages, masks, permanent makeup, solarium, laser treatments, henna, AHA acids, and ultrasound. Only one of them – solarium – according to the literature is not recommended for people suffering from vitiligo. Masks were chosen by 70.83% of respondents, followed by massages (66.67%), ultra-

sound 65.63%, henna 56.25%, permanent make-up 52.08%, and AHA acids 26.04%.

Task 20. Task 20 was a semi-open task and included the question "Are there any cosmetics dedicated to vitiligo sufferers?" The respondents had 3 options to choose from: a "no" answer, a "yes" answer and a re-

**Table 8.** Examples of cosmetic/cosmetological treatments that may have therapeutic value in vitiligo

Example of treatment	Year 1		Year 2		Year 3	
	Number of treatments	Percentage of treatments	Number of treatments	Percentage of treatments	Number of treatments	Percentage of treatments
Permanent makeup/micropigmentation	0	0	4	100	12	63.16
Fractional laser	0	0	0	0	5	26.32
AHA acids	0	0	0	0	2	10.53

quest to write an example by themselves, and an answer “I think so, but I can’t give an example”.

### Comparison of obtained results by year of study

Table 7 shows the results obtained for each year of study and the total of the surveyed population.

Among first- (93.33%) and second-year students (82.76%), the most common answer chosen was “I think so, but I can’t provide an example”. Two female students from the first year (6.67%) and one each from the second (3.45%) and third year (2.70%) stated that they were unaware of such cosmetics. None of the first-year students gave an example of cosmetics dedicated to vitiligo sufferers, while 4 second-year students (13.79%) did – they gave examples of 2 types of cosmetics: Pharmaceris cosmetics (25% of responses) and camouflage type cosmetics (75% of responses). Among the third-year respondents 28 (75.68%) provided examples. The cosmetics known to the third-year students included the following: camouflage cosmetics (13.51% response), Pharmaceris line for vitiligo patients (29.73% response), Kryolan cosmetics (24.32%), Sesderma (16.22%), and Dermablent (13.51%).

Task 21. Task 21 included the question “What skin care advice would you give to a client with vitiligo?” The respondents were to write an example of advice on their own. If they could not do it, they could indicate the option “I would not advise; I would refer to someone else for advice”.

Among the first-year students only 2 (6.67%) respondents decided to give counselling. Eight respondents from the second year undertook to give advice – 27.59%. The highest number offering counselling was seen among the third-year students – 23 (62.16%) of the respondents from that year. Analysing the results of the whole study population, 33 (34.38%) persons gave advice, while 63 (65.63%) decided to refer the client to another specialist. The respondents who declared to give advice usually gave several examples of skin care for vitiligo. A total of 98 pieces of advice were given, of which 85 were given by third-year students, 11 by second-year students, and 2 by first-year students. The most frequent pieces of advice were the following: the use of creams with a UV filter (29.59%

of advice), not to use a solarium (23.47% of the advice), permanent makeup (17.35%), avoiding sun exposure (16.33%), moisturizing the skin (7.14%), gentle makeup removal, and avoiding procedures that interrupt the skin’s continuity (3.6% each).

Task 22. Task 22 contained the question “Is there a cosmetic/cosmetological procedure that may have therapeutic value in vitiligo?” The respondents were asked to name the treatment referred to in the question. They could also choose to answer as follows: “I think so, but I can’t name it”, or they could indicate “no”.

None of the first-year female students surveyed could name a treatment that may have therapeutic value in vitiligo, but 90% thought there was such a treatment, and 10% chose the answer “no”. Among the second-year respondents, 10.34% of the female students (3 students) named a treatment, 79.34% said there was such a treatment but they did not know what kind, and 10.34% thought there was no such treatment. The largest number of third-year female students indicated a treatment of therapeutic importance in vitiligo – 19 (51.35%) people, 17 (45.95%) people believed that there is such a treatment but could not name it, while 2 (5.41%) persons believed that there is no such treatment. Analysing the results of the entire study population, it can be concluded that 22.92% of all respondents named a treatment of therapeutic importance in vitiligo, 69.79% chose the answer that there is such a treatment but they did not know what, and 8.33% believed that there is no such treatment. The respondents gave 3 examples of treatments that may have therapeutic value in vitiligo. The most frequently indicated by them was permanent makeup/micropigmentation; this example was given by 3 second-year students (100% of examples) and 12 third-year students (63.16% of examples given), laser treatments – suggested by 5 third-year students (16.32% of examples given), and AHA acids, micro-tattooing, permanent makeup, and laser therapy were indicated by 2 people (10.53% of examples provided) (Table 6).

### Discussion

Being knowledgeable about various dermatological conditions, including those that are rare, is extremely important in the work of a cosmetologist. People work-

ing in this profession should constantly expand their knowledge on various skin disorders. Only thoroughly educated cosmetology specialists are able to properly care for the safety and comfort of their clients. It is worthwhile for cosmetologists (people dealing with skin care and taking care of the aesthetic appearance) to provide support to people suffering from dermatological diseases and cosmetic defects. Skin diseases can significantly reduce the quality of life, so it is important that beauty parlour employees do not contribute to the stigmatization of patients [14]. A cosmetologist who has detailed knowledge about particular medical conditions may, for example, in cooperation with a dermatologist, contribute to improvement of the patient's health status, self-esteem, and self-confidence [15]. They can also advise the client on appropriate home skin care, and they know which treatments are advisable and which are inadvisable for people with the disease in question. Vitiligo, as described in this paper, is one of the dermatologic conditions. Approximately 60% of patients with vitiligo experience depressive symptoms as a result of their disease. Vitiligo lesions may contribute to isolation and stigmatization of patients [6, 7, 13, 14, 16–19].

In Ahmed's study, a statistically significant group of patients ( $p = 0.001$ ) considered themselves to be unattractive and rated the disease as affecting their social life. A statistically significant proportion of the general population studied by Ahmed excluded marrying a person with vitiligo ( $p = 0.026$ ) [20].

Juntongjin *et al.*, Asati *et al.*, Fatani *et al.*, Al Robaee *et al.*, and Saeed *et al.* investigated respondents' attitudes towards people with the disease and their knowledge about vitiligo [21–25]. This study focused only on the knowledge and professional skills of cosmetology students of Jan Kochanowski University in Kielce. The survey questionnaires of the above-mentioned authors included questions about the infectivity of vitiligo. Misconceptions about the infectiousness of the disease may contribute to social isolation of patients [21–25]. The majority of respondents surveyed by Alshammari and Mahfouz knew that vitiligo is not an infectious disease (98% correct responses of Alshammari respondents and 92% correct responses of vitiligo patients, 85% correct responses of close persons of patients, and 62% correct responses of the general population of Mahfouz respondents) [26, 27]. A large proportion of Ahmed's respondents believed that vitiligo is contagious ( $p = 0.008$ ) [20]. The author of the present study did not ask this question in the survey questionnaire because she considered that cosmetology students after dermatology classes can distinguish between conditions caused by microorganisms and those that are not contagious. In Kumar's study, 58.2% of the respondents knew that vitiligo is not associated with lack of hygiene and 57% knew that it is not spread by sharing things [28].

In Alshammari's study, it was difficult for the respondents to ask whether the concept of vitiligo is the

same as the concept of albinism – only 47.7% of the survey participants gave the correct answer [26].

In the study carried out among students of the university, 33.33% of the respondents correctly identified autoimmune factors, peripheral nerve pathologies, and melanocyte hyperreactivity as the aetiology of vitiligo. In the questionnaire of Fatani *et al.*, 49.4% of the respondents knew that the aetiology of vitiligo may have an autoimmune basis [22]. The same answer was given by 43.6% of the respondents according to Juntongjin [25]. The lower score of female cosmetology students may be because they had to select all probable causes of vitiligo. Fatani and Juntongjin, on the other hand, formulated a question only about the relationship between vitiligo and immunology [21, 22].

In Alshammari's study, more than half of the respondents (59.1%) gave an incorrect answer to the question about the correlation of vitiligo with immune defect [26].

The question about autoimmune disorders as a potential cause of vitiligo was also included in Mahfouz's survey questionnaire. An affirmative answer was marked by 69% of patients, 52% of patients' close relatives, and 26% of the general population [27].

In the studies of Juntongjin *et al.* and Alshammari *et al.*, 45.5% and 62.3% of the respondents, respectively, knew that the aetiology of vitiligo is not fully understood [25, 26].

Other factors affecting the aetiology of vitiligo are genetic background and stress.

Among the Saudi Arabians surveyed by Alshammari, 54.6% knew that genetic disorders could be an aetiological factor, and 60.3% knew that stress could contribute to the manifestation of the disease [26].

In the population studied by Kumar, 63.3% of the respondents knew that vitiligo may have a genetic basis. The correct exacerbating factors, i.e. stress and sun, were indicated by 68.4% and 58.4% of the respondents, respectively [28].

In Topal's study, in answer to the question regarding the aetiology of vitiligo, 84% of the respondents indicated stress, 22% genetic factors, and 37% sun exposure [29].

The survey questionnaire of Mahfouz *et al.* included a question about whether vitiligo is more prevalent among people experiencing chronic stress. The correct answers were as follows: 84% of patients with vitiligo, 80% of patients' relatives, and 61% of the general population. A sizable group of Mahfouz's respondents believed that genetic factors are not the cause of developing vitiligo. This answer was given by 39% of patients, 51% of patients' relatives, and 28% of the general population [27].

Surprisingly, in Saeed's study, up to 88% of the respondents believed that fate or destiny was the cause of vitiligo. Correct aetiological factors such as stress, genetic disorders, and autoimmune disorders were

marked, respectively, by 45%, 30%, and 20% of the respondents [24].

Another issue studied was the prognosis of vitiligo. In a study conducted among cosmetology students, 60.42% indicated the correct answer, taking into account the different prognosis depending on the type of disease and location of lesions. The female students knew that treatment generally takes a long time and does not lead to complete remission.

Other researchers tested whether their respondents knew that vitiligo could be cured. When asked if vitiligo could be cured, 67.4% of Alshammari's respondents gave the correct answer [26]. Among the respondents of Juntongjin *et al.* 41.6%, among the respondents of Asati *et al.* 68.9%, and among those surveyed by Al Robaee as much as 76.5% of the population answered affirmatively [21, 23, 25]. The differences in the outcomes of the presented studies may result from the differences in the education of the respondents.

In Mahfouz's study, 68% of patients, 60% of patients' relatives, and 53% of respondents from the general population knew about the possibility of vitiligo treatment. The majority of those surveyed by the authors mentioned above knew that vitiligo is not a fatal disease (in Alshammari's study as many as 99% of respondents) [26, 27]. In the study of Topal *et al.* 36% of the respondents believed that vitiligo is a serious disease [29].

Surprising in terms of prognosis is the fact that 59.1% of Al Robaee's respondents believed that vitiligo can be cured within 1 year. A small percentage of respondents (2.4%) thought that it would take a few days to cure vitiligo [24]. The reason for such opinions may be that the respondents do not have knowledge about diseases that do not affect them. The above study included people who do not suffer from vitiligo.

Among the students surveyed by the author of this work, only 11.6% correctly indicated the methods of treatment of vitiligo. The difficulty of this question was that the respondents had to correctly identify 4 methods of treatment. This included the names of drug groups and types of treatments that are not thoroughly discussed in cosmetology courses. This was probably the reason for the low score obtained by the respondents.

In the population studied by Kumar, the majority of the respondents were aware that various forms of treatment for vitiligo were available (82.3%); however, a significant proportion were not aware that surgical treatment for vitiligo was an option [28].

It is believed by the general population of central India that vitiligo can be completely cured by alternative medicine methods (55.7% of respondents) [22]. About 57.9% of the respondents of Fatani *et al.* knew that vitiligo can be treated by various methods [22].

In Ahmed's study, a small proportion of respondents believed that the course of the disease can be controlled. Most of the respondents thought that therapy with nb-UVB and topical corticosteroids was the most effective treatment [20].

Cosmetology students who correctly identified the period of life when vitiligo develops accounted for 54.17%. A slightly lower result was obtained by Asati *et al.*, who studied the general population of central India (38.9% correct answers) [21].

In the population studied by Ahmed, when asked about the age group in which vitiligo most commonly develops, 2/3 of the respondents indicated the age group 15-30 years. 9.3% of the respondents chose the answer 31-45 years [20].

The correct location of vitiligo lesions was selected by 20.83% of UJK respondents. Among the respondents of Asati, 44.9% knew the correct answer to the above question [21]. The difference in the result was probably because most of the answers proposed by the author included examples of correct locations mixed with incorrect ones. This could have been a difficulty for those who did not have extensive knowledge about the localization of vitiligo spots.

Almost half of Ahmed's respondents believed that vitiligo is a generalized skin disease. Sixteen percent of the respondents knew that the lesions can be localized to a periorbital-facial area. Only 3% of the respondents knew localized and segmental types of the disease can be distinguished. Most of the respondents indicated the arms when asked about the areas of the body in which vitiligo lesions may appear. A large number of respondents also indicated the head and neck and genital organs as locations of discoloration [20].

Only 14.58% of the cosmetology students surveyed knew the correct answer to the question regarding the percentage of the population affected by vitiligo. However, in the test by Al Robaee, as many as 41.13% of the respondents gave the correct answer [23]. The most common answer chosen by my respondents was less than 5%. This shows that female UJK students know that vitiligo is a rare disease, but they do not know the exact percentage of patients. Among Asati respondents, 69.6% considered vitiligo as a rare disease [21].

In Ahmed's survey questionnaire, 13% of the respondents marked the prevalence of vitiligo as 1-5%, while 10% of the respondents estimated the prevalence of the condition as 5-10% [20].

Most of the students surveyed knew that the main symptom of vitiligo was the presence of one or more discoloured spots on the body (87.50% of the respondents). Respondents also had no problem to determine which cosmetic plays a key role in the care of lesional skin (87.50% of respondents). A significant proportion of the respondents (81.25%) were aware that vitiligo may be a part of the entire disease syndrome. This shows that the students have a basic general knowledge of the disease. Slightly worse results were related to questions about the correlation between vitiligo and other diseases (63.54% correct answers) and the possibility of re-pigmentation in people with vitiligo (69.79%). The question about Koebner's sign was more difficult – the correct

answer was given by 33.33% of respondents. Third-year students coped with this issue the best – 64.86% of them answered correctly. The low general result in the whole studied population was probably caused by the fact that younger respondents had not yet discussed this issue during dermatology classes.

The highest percentage score in the closed tasks was achieved by third-year students (50.24%); the weakest results were recorded for the second year (39.94%). The arithmetic mean score for third-year students was 8.54 out of 17 possible. Female residents of urban areas received a slightly higher average score (45.59% of possible points) than female residents of rural areas (42.81%). Taking into account the age of the respondents, the oldest female students aged 23–26 years did best with the closed tasks, obtaining 49.71% of all points. Students declaring employment received a better result than those not working (46.08% of points).

A similar trend was also observed when analysing the semi-open tasks. The exception was the criterion of place of residence. In this case, the inhabitants of rural areas did better than inhabitants of cities.

A likely reason for these results is the fact that third-year students (who are also the oldest in the surveyed population) had completed a full course in dermatology, had taken more vocational courses, and had finished their internships. This gave them more opportunities to acquire professional knowledge and skills. Working students were likely to have encountered various cosmetic defects and dermatological diseases in clients, which motivated them to expand their knowledge independently. The differences according to the place of residence may have been because in rural areas practical knowledge is more valued than theoretical knowledge.

A similar trend was observed by Fatani *et al.* among their respondents: older people had slightly greater knowledge than younger people. The knowledge of academics was greater than that of students [22].

In the population surveyed by Alshammari, women showed greater knowledge and a more positive attitude towards patients than men [26].

The knowledge of the respondents about vitiligo in different studies was as follows: 58.16% (Robaee *et al.*), 25% (Juntongjin *et al.*), 11.4% (Asati *et al.*) [21, 23, 25]. These results may be due to the diversity of respondent groups, among other reasons. The respondents of the study by Al Robaee *et al.* included both scientific workers and students of Qassim University, Buraidah [23]. Juntongjin's respondents were health care workers, patients of Thammasat University Hospital, and staff and students of Thammasat University [25]. In contrast, Asati surveyed the general population of central India [21]. It is possible that the education of the respondents influenced the results obtained in the following study.

The level of knowledge regarding vitiligo was also studied by Tsadik among the Ethiopian population. His study shows that Ethiopians have adequate knowledge about the condition [30].

In Alshammari's study, Saudi Arabian residents showed considerable knowledge about vitiligo. The average score of the participants in the knowledge test conducted by the researcher was 7.1 out of a possible 10 points. In the test of attitudes towards people affected by vitiligo, the average score of positive attitudes was 5.7 points out of 7 possible [26].

Among the Thais studied by Juntongjin, a significant percentage of the respondents had misconceptions about vitiligo [25]. Also, in AlGhandi's study among a population of residents of Riyadh (Saudi Arabia), a significant proportion of respondents had misleading and erroneous beliefs about vitiligo.

In Kumar's study, a sizable group of respondents declared that they would avoid shaking hands with a person suffering from vitiligo [28].

Among Saeed's respondents, 58% felt that vitiligo significantly affected the way other people perceived them. As many as 75% of the respondents reported experiencing stress due to their disease, and 45% of the respondents reported recurrent depressive conditions [24].

The results obtained by the author of this study show that students of cosmetology at Jan Kochanowski University in Kielce have general knowledge allowing them to diagnose vitiligo in their clients and to advise them on how to take care of the affected skin. However, they do not have a good understanding of purely medical and biochemical issues related to this disease. Therefore, more attention should be paid to increase the theoretical knowledge of students about rare dermatological disorders. It is very important that ignorance or knowledge deficits in cosmetologists do not lead to denial of safe treatments to patients, which could exacerbate their sense of social isolation and rejection.

## Conclusions

Students of cosmetology at Jan Kochanowski University demonstrated general knowledge about vitiligo, allowing the diagnosis of vitiligo and advice on skin care. Among the respondents of the first-degree studies in cosmetology the greatest knowledge of vitiligo was observed in the students of the third year. Second-year students of Jan Kochanowski University in Kielce had the lowest knowledge of vitiligo among the surveyed population. Working students showed higher practical knowledge than the students who had not yet taken up work. It is recommended that cosmetology students of Jan Kochanowski University in Kielce broaden their knowledge on the following: methods of vitiligo treatment, typical localization of vitiligo lesions, and cosmetic procedures that may contribute to the formation of new vitiligo spots. However, this issue requires fur-



ther research conducted on a wider group of respondents. The limitation of the present study was that it was carried out at only one university, i.e. Jan Kochanowski University in Kielce, and not all the cosmetology students were willing to fill out the questionnaire.

### Conflict of interest

The authors declare no conflict of interest.

### References

- Adamski Z, Kaszuba A. *Dermatologia dla kosmetologów*. Elsevier Urban & Partner, Wrocław 2010.
- Pawluczuk W. Bielactwo nabyte-współczesne poglądy na etiopatogenezę i możliwości leczenia. *Nowa Medycyna* 2000; 11: 1-5.
- Rodrigues M, Hons MBBS, Ezzedine K, Hamzavi I, Pandya AG, Harris JE. New discoveries in the pathogenesis and classification of vitiligo. *J Am Acad Dermatol* 2017; 77: 1-13.
- Ezzedine K, Eleftheriadou V, Whitton M, van Geel N. Vitiligo. *Lancet* 2015; 386: 74-84.
- [https://www.pfm.pl/baza\\_chorob/dermatologia-praktyczna/bielactwo-nabyte---objawy-i-przyczyny/36](https://www.pfm.pl/baza_chorob/dermatologia-praktyczna/bielactwo-nabyte---objawy-i-przyczyny/36) - 2018.06.08
- Alikhan A, Felsten LM, Daly M, Petroniv-Rosic V. Vitiligo: a comprehensive overview Part I. Introduction, epidemiology, quality of life, diagnosis, differential diagnosis, associations, histopathology, etiology, and work-up. *J Am Acad Dermatol* 2011; 65: 473-491.
- Felsten LM, Alikhan A, Petroniv-Rosic V. Vitiligo: a comprehensive overview. Part II: Treatment options and approach to treatment. *J Am Acad Dermatol* 2011; 65: 493-513.
- Putynkowska A, Czubek. Bielactwo. Etiopatogeneza, obraz kliniczny oraz współczesne możliwości terapeutyczne. *Kosmetol Estet* 2018; 7: 535-540.
- Pawlik M. Ukryte bielactwo – mikropigmentacja medyczna. *Kosmetol Estet* 2017; 6: 385-387.
- Solpa-Archa N, Griffith JL, Huggin RH, Henderson MD, Kerr HA, Jacobson G, Mulkar SV, Lim HW, Hamzavi JH. Long-term follow up of patients undergoing autologous monocoltured melanocyte-keratinocyte transplantation for vitiligo and others leukodermas. *J Am Acad Dermatol* 2017; 77: 318-327.
- Osińska M, Rysiak E. Zmiany skórne w bielactwie nabytym – możliwości terapeutyczne. *Kosmetol Estet* 2017; 6: 481-486.
- Iha A, Mehta M, Khaitan BK, Sharma VK, Ramam M. Cognitive behavior therapy for psychosocial stress In vitiligo. *Indian J Dermatol Veneral Leprol* 2016; 82: 308-310.
- Grimes PE, Miller MM. Vitiligo: patient stories, self-esteem, and the psychological burden of disease. *Int J Womens Dermatol* 2018; 4: 32-37.
- Parsad D, Dogra S, Kanwar AJ. Quality of life in patients with vitiligo. *Health and Quality of Life Outcomes* 2003; 1: 58-60.
- Kornhaber R, Visentin D, Thapa DK, West S, McKittrick A, Haik J, Cleary M. Cosmetic camouflage improves quality of life among patients with skin disfigurement: a systematic review. *Body Image* 2018; 27: 98-108.
- Cupertino F, Niemeier-Corbellini JP, Ramose-Silva. Psychosomatic aspect of vitiligo. *Clin Dermatol* 2017; 35: 292-297.
- Vallerand JA, Lewinsson RT, Parsons LM, Hardin J, Haber RM, Lowerison MW, Barnabe Ch, Patten SB. Vitiligo and major depressive disorder: a bidirectional population-based kohort study. *J Acad Dermatol* 2019; 80: 1371-1379.
- Tkanchenko E, Rafat MA, Balzano T, Maloney ME, Harris JE. Patient satisfaction and physician productivity in shared medical appointments for vitiligo. *J Am Acad Dermatol* 2019; 81: 1150-1156.
- AlGhamdi KM. Beliefs and perceptions of Arab vitiligo patients regarding their conditio. *Int Soc Dermatol* 2010; 49: 1141-1145.
- Ahmed N, Khan KS, Shabbir H, Khan T, Khan A, Naveed. Public's perception and knowledge about psychosocial issues faced by vitiligopatients. *Int J Curr Med Pharm Res* 2020; 6: 5034-5042.
- Asati DP, Gupta CM, Tiwari S, Kumar S, Jamra V. A hospital-based study on knowledge and attitude related to vitiligo among adults visiting a tertiary health facility of central India. *J Nat Sci Biol Med* 2016; 7: 27-32.
- Fatani MI, Aldhari RM, Al. Otaibi HO, Kalo BB, Khalifa M. Acknowledging popular misconceptions about vitiligo in western Saudi Arabia. *J Dermatol Dermatol Surg* 2016; 20: 27-31.
- Al Robaee AA, Zolibani AA, Al-Shobaili HA. Knowledge and attitude towards vitiligo in Qassim Locality, Saudi Arabia. *J Pakistan Assoc Dermatol* 2008; 18: 78-83.
- Saeed AHM. Beliefs, knowledge, and perceptions of Najrani vitiligo patients regarding their illness. *Int J Med Sci Public Health* 2020; 9: 189-193.
- Juntongjin P, Rachawong C, Nuallaong W. Knowledge and attitudes towards vitiligo in the general population: a survey based on the simulation video of a Real situation. *Dermatologica Sinica* 2018; 36: 75-78.
- Alshammari S, Alanazi S, Alanazi K, Alsadady K, Algharbi N, Alsudairy F. Attitude and knowledge toward Vitiligo among Saudi Arabia population. *Int J Med Develop Countries* 2021; 5: 1160-1165.
- Mahfouz A, El-Gilany AH, El-Ghobary MF, Fayed HAR. Knowledge of patients, relatives and non-relatives and their attitude towards vitiligo. *J Pakistan Assoc Dermatol* 2020; 30: 434-440.
- Kumar NA, Abhinesh N, Sukanya G, Sangaiah S. Knowledge, attitude and behaviour study of vitiligo among general population. *IP Indian J Clin Exp Dermatol* 2021; 7: 228-231.
- Topal IO, Duman H, Emek O, Goncu K, Durmuscan M, Gungor S, Ulkumen PK. Knowledge, beliefs, and perceptions of Turkish vitiligo patients regarding their conditio. *An Bras Dermatol* 2016; 91: 770-775.
- Tsodik AG, Teklemedhin MZ, Atey TM, Gidey MT, Desta DM. Public knowledge and attitudes towards vitiligo: a survey in Mekelle City, Northern Ethiopia. *Dermatol Res Practice* 2020; 2020: 3495165.

### Address for correspondence:

**Małgorzata A. Czarny-Działak** MD, PhD  
Institute of Health Sciences  
*Collegium Medicum*  
Jan Kochanowski University  
Kielce, Poland  
Phone: +48 602570179  
E-mail: drmczarny@interia.pl