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SURVEY OF DOCTORS ON PREVENTION, SCREENING AND WAYS OF ROUTING OF PATIENTS WITH MALIGNANT SKIN NEOPLASMS

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ABSTRACT. Malignant neoplasms of the skin ranks one of the leading places in the overall structure of oncological morbidity in the Russian population, second only to breast cancer. In 2021, there were 7.82 cases of melanoma and 46.93 cases of non-melanoma skin cancer per 100,000 population. Dermatovenerologists, general practitioners, therapists, as well as doctors of other medical specialties in their daily practice are faced with malignant skin tumors. The aim of our research was to study the awareness of doctors of various specialties, as well as people without higher medical education, about the risk factors and prevention of malignant skin tumors, as well as about the patient routing paths. We interviewed doctors of various medical specialties and people without a higher medical education regarding risk factors and prevention of malignant skin tumors, as well as patient routes. The median of correct answers was 16 out of 22 (72.7%). Only 4 out of 463 people answered all questions correctly (0.9%, 95% CI 0.24–2.2). Most often, incorrect answers were given to questions related to screening. It seems appropriate to include questions on organizational measures to reduce the burden of melanoma incidence in training programs for doctors who face skin tumors in their practice, as well as specialists of healthcare organization and public health.

KEY WORDS: survey; prevention; malignant neoplasms of the skin; screening; routing.

ОПРОС ВРАЧЕЙ О ПРОФИЛАКТИКЕ, СКРИНИНГЕ И ПУТЯХ МАРШРУТИЗАЦИИ ПАЦИЕНТОВ СО ЗЛОКАЧЕСТВЕННЫМИ НОВООБРАЗОВАНИЯМИ КОЖИ

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РЕЗЮМЕ. Злокачественные новообразования кожи занимают одно из лидирующих мест в общей структуре онкологической заболеваемости населения России, уступая только раку молочной железы. В 2021 году было выявлено 7,82 случая меланомы и 46,93 случая немеланомного рака кожи на 100 тысяч населения. Врачи-дерматовенерологи, врачи общей практики, участковые терапевты, а также врачи других медицинских специальностей в своей повседневной работе сталкиваются со злокачественными новообразованиями кожи. Целью нашего исследования было изучить информированность врачей различных специальностей, а также людей без высшего медицинского образования о факторах риска и профилактике злокачественных новообразований кожи, а также о путях маршрутизации пациентов. Нами были опрошены врачи разных медицинских специальностей и люди без высшего медицинского образования относительно факторов риска и профилактики злокачественных новообразований кожи, а также о путях маршрутизации пациентов. Медиана правильных ответов составила 16 из 22 (72,7%). Верно на все вопросы ответили только 4 человека из 463 (0,9%; 95%ДИ 0,24–2,2). Чаще всего неверные ответы давались на вопросы, касающиеся проведения скрининга. Представляется целесообразным включение вопросов, посвященных организационным мероприятиям по снижению бремени заболеваемости меланомой, в программы повышения квалификации врачей, которые имеют право проводить дифференциальную диагностику злокачественных новообразований кожи, а также специалистов по организации здравоохранения и общественному здоровью.

КЛЮЧЕВЫЕ СЛОВА: опрос; профилактика; злокачественные новообразования кожи; скрининг; маршрутизация.

INTRODUCTION

Malignant neoplasms (MN) of the skin occupy one of the leading places in the structure of oncological morbidity of the Russian population. Thus, in 2021, 7.82 cases of melanoma and 46.93 cases of non-melanoma skin cancer per 100 thousand population were detected [4]. In their daily work, doctors of different specialties — dermatologists, oncologists, therapists, general practitioners and others are involved with these diseases.

AIM

To study the awareness of doctors of various specialties and people without higher medical education about risk factors and prevention of malignant skin neoplasms, as well as patient routing pathways.

MATERIALS AND METHODS

We interviewed 463 people, including 372 women (81%) and 87 men (19%) aged 20 to 72 years. Among the respondents, 80 were dermatologists (17.4%), 14 were oncologists (3.1%), 184 were doctors of other specialities (40.1%), and 181 were without higher medical education (39.4%). The questions asked, response options, and comments are presented in the “discussion” section. Statistical processing of the survey results consisted of calculating the proportion attributable to each of the presented answer choices, as well as the proportion of correct answers to the questions with the corresponding exact proportion confidence interval (Klopper-Pearson). Calculation of confidence intervals was performed in the R statistical system (version 3.3) [32].

RESULTS

Distribution of respondents answers to the questions is presented in Figures 1 and 2. For clarity of the graph, all correct answers were placed on the first variant. The great majority of respondents answered each of the questions correctly; nevertheless, a significant percentage of respondents made mistakes in most of the questions. The median number of correct answers was 16 out of 22 (72.7%). Only 4 out of 463 respondents answered all questions correctly (0.9%; 95% confidence interval 0.24–2.2). The most frequently incorrect answers were given to the questions: which of the following is most important for effective screening (197 correct responses out of 457; 43.1%; 95% confidence interval 38.5–47.8); which of the following is not an optimal screening goal (222 correct responses

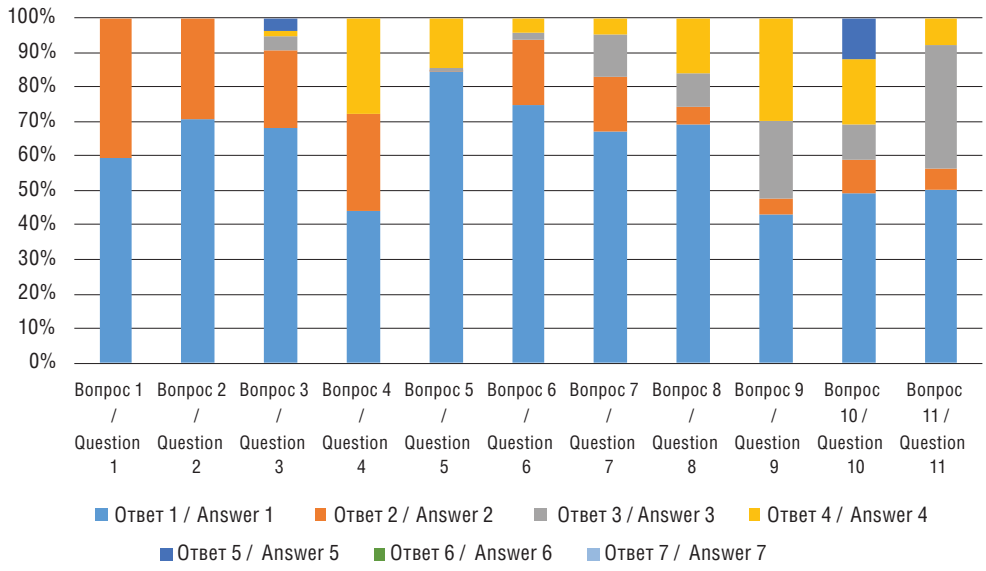

Fig. 1. Distribution of respondents' answers to the questions 1–11 of the questionnaire on the prevention of skin cancer

Рис. 1. Распределение ответов респондентов на вопросы 1–11 анкеты о профилактике злокачественных новообразований кожи

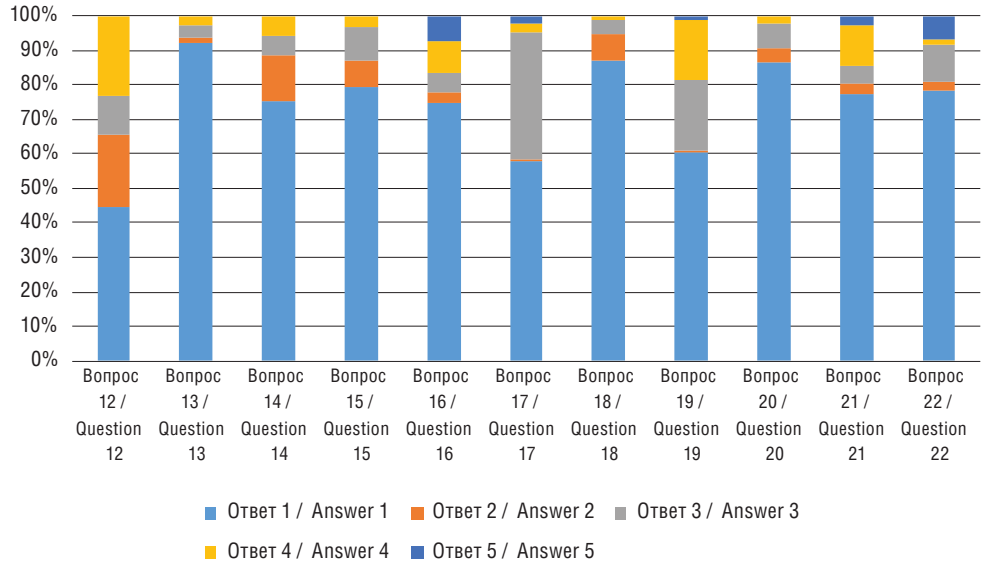

Fig. 2. Distribution of respondents' answers to the questions 12–22 of the questionnaire on the prevention of skin cancer

Рис. 2. Распределение ответов респондентов на вопросы 12–22 анкеты о профилактике злокачественных новообразований кожи

out of 450; 49.3%; 95% confidence interval 44.6–54.1); which of the melanoma screening strategies appears to be most effective (205 out of 458; 44.8%; 95% confidence interval 40.1–49.4); select the incorrect statement (screening risks question) (230 correct answers out of 458; 50.2%; 95% confidence interval 45.5–54.9); traumatisation of pigmented nevus can lead to malignancy (272 correct answers out of 459; 59.3%; 95% confidence interval 54.6–63.8).

DISCUSSION

1. Can traumatisation of pigmented nevus lead to the malignancy?

Answer options: 1. No. 2. Yes.

The role of mechanical trauma in the pathogenesis of melanoma has been a topic of debate in the medical literature for many years. One study showed that trauma did not cause malignisation of melanocytic tumours in hamsters [21].

Another study concluded that skin trauma in Xiphophorus fish cannot cause melanoma [22]. In yet another study, most melanoma patients denied the association between possible trauma and melanoma formation [26]. Trauma does not appear to be a risk factor for melanoma, but may contribute to the progression of pre-existing melanoma. In addition, trauma may draw the patient's attention to pre-existing melanoma [31].

2. Does prophylactic removal of nevi reduce the chance of melanoma?

Answer options: 1. No. 2. Yes.

For a 20-year-old person, the lifetime risk of any nevus transforming into melanoma by age 80 is approximately 0.03% (1 in 3,164) for men and 0.009% (1 in 10,800) for women. Thus, prophylactic removal of nevi does not reduce the chance of melanoma [24].

3. Which localisation of nevus is the most dangerous for the appearance of melanoma?

Answer choices: 1. Melanoma appears in most cases on healthy unchanged skin. 2. Melanoma in most cases appears on the background of a previous nevus.

The probability of transformation of the nevus in melanoma is extremely low, also traumatisation of the nevus does not cause its malignancy, and therefore, the localisation of the nevus for the appearance of melanoma does not play a role.

4. Specify the correct statement.

Answer options: 1. Melanoma in most cases appears on healthy unchanged skin. 2. Melanoma in most cases appears on the background of a previous nevus.

According to various studies, on average 30% of melanomas are associated with a nevus, while the remaining 70% appear de novo, i.e. on unchanged skin [10, 11, 17, 23].

5. Which of the listed risk factors is the most important for the appearance of melanoma?

Answer options: 1. Ultraviolet B spectrum (UVB). 2. Smoking. 3. Alcohol abuse. 4. Regular traumatisation of nevi.

UVB is a known risk factor for melanoma [15]. Smoking is not a risk factor for melanoma; moreover, some studies have shown an inverse association between smoking and melanoma risk in men [35]. There are different data on alcohol and melanoma risk in the literature, with some studies reporting a moderate risk of melanoma in people who drink alcohol [20]. Other studies have not found such an association [30]. However, even in those studies where an association was found, the authors point out that their data are insufficient to consider alcohol a risk factor.

6. Which of the following is understood as primary prevention of skin melanoma?

Answer options: 1. The limiting skin exposure to ultraviolet radiation as the main provoking factor for melanoma. 2. Examination of the skin for the purpose of early diagnosis, both independently by the patient and by a specialist. 3. Completion of medical examinations. 4. Observation of suspicious neoplasms in dynamics.

Primary prevention — a set of measures aimed at preventing the development of the disease. Such a measure is the limitation of exposure of the skin to ultraviolet radiation (UVR). Examination of the skin for the purpose of early diagnosis, medical check-ups, observation of suspicious neoplasms belong to secondary prevention [33].

7. Which of the following is understood as secondary prevention of skin melanoma?

Answer options: 1. Examination of the skin for the purpose of early diagnosis, both independently by the patient and by a specialist. 2. Limitation of skin exposure to ultraviolet radiation as the main provoking factor for melanoma. 3. Regular application of sunscreen. 4. Refusal to visit the solarium.

Secondary prevention — a set of measures aimed at early detection, prevention of exacerbations, complications and chronicity of diseases. Secondary prevention includes examination of the skin for early diagnosis. The limitation of skin exposure to ultraviolet radiation, regular use of sunscreen and avoidance of sunbeds are primary prevention [36].

8. Which of the listed specialists has no rights, according to the Russian legislation, to carry out differential diagnostics of malignant skin neoplasms?

Answer options: 1. All those listed have this right. 2. A dermatovenerologist. 3. A general practitioner. 4. A district therapist.

According to the Russian legislation, a district general practitioner, a dermatovenerologist and a general practitioner have the right to perform differential diagnosis of skin MN. In case of suspicion of MN they refer the patient to an ambulatory oncological care centre or to a primary oncological cabinet for primary specialised medical and sanitary care [5, 8].

9. Which of the following is most important for effective screening?

Answer options: 1. The disease should have a recognisable latent or early symptomatic phase. 2. There must be effective treatment options available for late stages of the disease. 3. The disease should be included in the list of socially important diseases. 4. Surrogate endpoints for screening must be clearly stated.

For screening to be effective, the following principles must be met: the disease is an important medical problem; there is a cure for the disease; diagnosis and treatment are available; the disease has a recognisable latent or early symptomatic phase; a method for detection has been developed; the progression of the disease from latent to manifest is clear; the economic costs of disease detection are balanced against the total costs; case detection should be an ongoing process [40]. Effective treatment options for late-stage disease, inclusion in the list of socially important and clear formulation of surrogate endpoints are not among the important principles of screening.

10. Which of the following is not an optimal goal of screening?

Answer options: 1. A statistically significant reduction in surrogate indicators. 2. Reduction in disease incidence through detection and treatment of disease precursors. 3. Reducing the severity of the condition by identifying people with the disease and offering effective treatment. 4. Increasing treatment choices by identifying conditions or risk factors earlier in life when more options are available. 5. Reducing mortality through early detection and early treatment of the condition.

The goals of screening, as recommended by the World Health Organisation, may be: to reduce mortality by early detection and treatment of the condition; to reduce morbidity by detecting and treating precursors of the disease; to reduce the severity of the condition by identifying and treating patients; to expand treatment choices by identifying conditions or risk factors early in life [34]. A surrogate endpoint is a biomarker designed to replace an endpoint in a study. The use of surrogate points has several advantages — an easier identification and measurement, smaller required sample size, duration and cost of clinical trials. Surrogate endpoints may not reflect the immediate goals of treatment or may be unreliable [6].

11. Select the incorrect statement.

Answer options: 1. Screening does not have risks. 2. Screening can lead to false negative results. 3. Screening can lead to iatrogenic complications. 4. Screening can lead to false positive results.

In addition to the benefits, screening has risks, such as false positive results. For example, some women with false positive mammography results have increased anxiety and are less likely to attend repeat screening procedures [16]. In addition, false-negative results are also possible, leading to a false sense of safety and lack of timely treatment, which worsens the prognosis of the disease [19]. In some situations, screening may has risks of iatrogenic complications [13].

12. Which melanoma screening strategy appears to be the most effective?

Answer options: 1. Annual examination of all skin with dermatoscopy in people at risk for melanoma. 2. Annual examination of all skin with dermatoscopy in people over 35 years of age. 3. Examination of all skin with dermatoscopy when a patient self-reports a bothersome neoplasm to a physician. 4. Examination of all skin with dermatoscopy in all patients who come to the medical centre for various reasons.

Annual dermatoscopy skin examinations in people at risk for melanoma would seem to be the optimal screening strategy because it would capture the population most likely to develop melanoma. Routine screening of patients who are not at risk appears to be labour intensive and costly with questionable efficacy [27]. Skin examination with dermatoscopy when a patient self-reports a bothersome neoplasm is an important diagnostic condition, but such screening is not aimed at early detection of skin MN and usually identifies already invasive tumours. It is not always possible to examine the skin with dermatoscopy in all patients who come to a medical centre for various reasons due to limited time.

13. Which of the following would improve the quality of skin melanoma screening better than other variants?

Answer options: 1. Pre-identification of risk groups and screening in high risk groups. 2. Screening patients only in the age group of 60 years or more. 3. Examination of patients with more than 100 moles only. 4. Examine only those patients who have complaints.

Patient's age above 60 years is a risk factor for melanoma, but melanoma also occurs at earlier ages [4]. The number of nevi in a patient more than 100 is also a risk factor, but melanoma can also appear in people with a small number of nevi. Examining only those patients who have complaints will not lead to detection of melanoma in the initial stages [5]. Early identification of at-risk groups will allow patients with various risk factors for melanoma to be targeted.

14. At an appointment, the therapist has identified that a patient is at high risk for melanoma of the skin. Which routine plan do you think would be optimal?

Answer options: 1. Refer the patient to a dermatologist for monitoring of skin neoplasms. 2. Refer the patient to the primary oncology office at the outpatient clinic. 3. Refer the patient to a specialised oncological institution for cytological examination. 4. Refer the patient to a specialised oncological institution for histological examination.

Patients at risk for melanoma require regular whole skin examination with dermatoscopy [12]. Referral of the patient to the primary oncology office of the polyclinic is required if the patient has clinical signs of melanoma. According to the equipment standard, there is no dermatoscope in such cabinets, which means that it is difficult to detect melanoma at the stage when it has no clinical signs [9]. Referral to a specialist oncology centre for cytological or histological examination is a variant of routing when there is a sign of melanoma [5]. Referring a high-risk patient to a dermatologist for monitoring of skin neoplasms is the best option, as the dermatologist has a dermatoscope, according to the standard equipment, and often has equipment for fixing dermatoscopic images with subsequent follow-up [8].

15. A patient comes to the general practitioner complaining of a darkening mole. Which routing plan do you see as the most optimal?

Answer options: 1. Refer the patient to a dermatologist for dermatoscopy. 2. Refer the patient to a specialised oncology facility for histological examination. 3. Refer the patient to the primary oncology office of the outpatient clinic. 4. Refer the patient to a specialised oncological institution for cytological examination.

The darkening of the mole may be a sign of melanoma, but it can also be the result of other causes, such as trauma. Differential diagnosis in this situation requires dermatoscopy, which can be performed by a dermatologist [5]. As stated in the second paragraph of the previous question, due to lack of equipment, the diagnosis will not be able to be effective [9]. Until the morphological verification stage, non-invasive diagnosis is optimal [5].

16. Which of the listed risk factors is the most significant for melanoma development?

Answer options: 1. A personal history of melanoma in anamnesis. 2. Light hair colour. 3. The presence of freckles. 4. The patient has never received a whole skin examination by a specialist. 5. The Total number of nevi on the body is up to 50.

The patient's history of never having a whole skin examination by a specialist is not a risk factor for melanoma. The total number of nevi on the body up to 50 is also not a risk factor [5]. According to the melanoma risk scale, light hair colour and the presence of freckles have a minimum score and a personal history of melanoma has a maximum score [1].

17. A 35-year-old woman came for a check-up for a bothersome neoplasm. On history taking, she denies a personal history of skin cancer, but notes basal cell carcinoma in her father, as well as heavy sunbed use during her student years. Which of the following is most worrying about a high risk of melanoma?

Answer options: 1. Attendance a solarium. 2. Female gender. 3. Family history of basal cell skin cancer. 4. Age of 35 years. 5. Patient is not at risk for melanoma.

Age of 35 years is not a risk factor for melanoma. In Russia, women have melanoma more often than men [4], but gender is not a risk factor. A family history of basal cell skin cancer increases the probability of melanoma, but is not a significant risk factor [7, 38]. Sunbed use is a known and significant risk factor [37].

18. Which of the following is most appropriate for melanoma prevention for the patient from the previous question?

Answer options: 1. Advise the patient to minimise UVR, including avoiding solarium use. 2. Advise the patient to apply sunscreen with UVB protection once daily. 3. Counselling on minimising UVR exposure is not required as she is 35 years old and the most dangerous sunburns occur in childhood. 4. Counselling

the patient on the benefits of natural sunlight to maintain vitamin D levels.

Counselling the patient to minimise UVR exposure will ensure that the patient does not increase her risk of melanoma [37].

19. A 27-year-old man came for a preventive skin neoplasm check-up. Denies a personal and family history of skin MN, sunburns and sunbed use. He had a history of mild eczema since early childhood, for which he had received topical glucocorticoids. Examination reveals up to 50 pigmented nevi with even borders and uniform colouration. Which of the following is of greatest concern for a high risk of melanoma?

Answer options: 1. The patient is not at risk for melanoma. 2. Male gender. 3. History of skin disease and treatment for it. 4. Number of nevi up to 50 pieces. 5. Age of 27 years.

Age 27 years, male gender, history of skin disease and treatment with topical hormones, and number of nevi under 50 are not risk factors for melanoma. Thus, this patient has no risk factors [5].

20. A 65-year-old female patient visited a dermatologist for a chronic skin disease in the hand area. The dermatologist noticed a suspicious neoplasm in the forehead area, of which the patient had no complaints. The neoplasm has irregular borders, diameter about 1 cm, black in colour with different shades of brown. Which doctor's tactics are most consistent with the Russian legislation?

Answer options: 1. After finishing the discussion of the skin disease, offer the patient to perform dermatoscopy of the suspected neoplasm, as well as a complete skin examination. 2. Continue the consultation about the skin disease and then advise the patient to see an oncologist to diagnose the neoplasm. 3. Perform a biopsy of the suspicious neoplasm. 4. After discussion of the skin disease, photograph the neoplasm and advise the patient to come back in 3 months to assess the dynamics.

The described clinical picture should raise suspicion of melanoma. A dermatologist is not allowed to perform a biopsy of a malignant neoplasm [5]. Not only melanoma may have such a clinical picture, for example, seborrhoeic keratosis may look similar, so it is advisable to perform a dermatoscopy before sending the patient to an oncologist. If melanoma is suspected, observation is inappropriate, as it may lead to a worsening of the prognosis of the disease. Thus, the tactic of a dermatovenerologist, which is most consistent with Russian legislation, is as follows: to suggest the patient to perform dermatoscopy of the suspected neoplasm, as well as a complete skin examination, since other parts of the body may also have MN and other life-threatening conditions manifested by skin rashes [2, 3]. If dermatoscopic signs of malignancy are detected, to provide a referral to a primary oncological centre [5, 8].

21. A 57-year-old man with a family history of melanoma and multiple sunburns in childhood came in for evaluation of skin neoplasms. He reports that he has had at least 10 skin biopsies in the past, all of which were interpreted as dysplastic nevi with mild to moderate atypia. On examination, the patient is found to have more than 100 nevi, some of which are greater than 5 mm in size and multiple colours. What is the most appropriate secondary prevention tactic for this patient?

Answer options: 1. Consider using skin neoplasm mapping to help identify new/changed nevi. 2. Discuss health related quality of life and provide a validated quality of life screening questionnaire. 3. Consider using artificial intelligence (AI) algorithms to assess his nevi. 4. Advise on sun safety (i.e. reduce UVR exposure, use sun-protective clothing). 5. Prescribe nicotinamide 500 mg twice daily for systemic chemoprophylaxis.

Mapping of skin neoplasms is a medical procedure that involves photofixation of the patient's entire skin and dermatoscopic images of the neoplasms for dynamic surveillance, which significantly improves the quality of secondary prevention [25]. Sun safety counselling is related to primary prevention of melanoma [18]. AI for the evaluation of skin neoplasms is a way to support physician decisions and is not a prevention in itself. There are studies showing that nicotinamide supplementation can be used as primary prevention of skin MN [29].

22. A patient asks you about skin self-examination for early detection of melanoma. Which of the following would be the most appropriate response?

Answer options: 1. Self skin examination should be performed monthly and suspicious neoplasms should be reported to a health care provider. 2. Self skin examination should be

limited to areas of the body exposed to the sun (i.e., face, scalp, hands). 3. Recommend the use of a smartphone app to aid in the detection of neoplasms, as all digital apps are validated screening tools. 4. Recommend that the patient purchase a dermatoscope to visualise lesions once a month and identify the "ugly duckling" symptom. 5. Self-examination of the skin is not recommended as people who do it are more likely to find thicker tumours.

Self-examination is a form of secondary prevention of skin MN and should be recommended to the patient. Such inspection should not be limited to specific areas of the skin [14]. Various smartphone apps exist to improve the quality of self-examination, but not all of them are validated and therefore not always effective [39]. Advising a patient to purchase a dermatoscope will not improve the effectiveness of secondary prevention of skin MN, as dermatoscopy is ineffective when used by a person without specialised training [28].

CONCLUSION

The majority of respondents successfully completed the test and gave correct answers to most questions. However, only 0.9% of respondents gave correct answers to all questions (95% confidence interval 0.24–2.2). Incorrect answers were often given to questions related to screening, suggesting that physicians need to be further informed about the aims and objectives of organising screening activities. It seems advisable to include questions on organisational measures to reduce the burden of melanoma morbidity in advanced training programmes for doctors who have the right to perform differential diagnosis of malignant skin neoplasms, as well as specialists in health care organisation and public health.

ADDITIONAL INFORMATION

Author contribution. Thereby, all authors made a substantial contribution to the conception of the study, acquisition, analysis, interpretation of data for the work, drafting and revising the article, final approval of the version to be published and agree to be accountable for all aspects of the study.

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