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Problems Involving Contagious Diseases and Tropical Medicine – New Challenges for Health Care Staff

Problemy związane z chorobami zakaźnymi i medycyną tropikalną – nowe wyzwania dla pracowników ochrony zdrowia

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Abstract

Background. According to current data published by the World Tourism Organization, over 150 million travellers have visited developing countries every year during the last decade. Undoubtedly, appropriate knowledge in the field of tropical medicine is important for healthcare professionals, including nurses, who are increasingly exposed to clients/patients travelling to or from tropical countries.
Objectives. The purpose of the study was to evaluate the level of knowledge of contagious diseases and tropical medicine among nurses and nursing students in the Podlaskie District of Poland.
Material and Methods. The study was based on two self-developed survey questionnaires, one of which was administered to 500 nurses in the Podlaskie District and the other to 500 nursing students at the Medical University in Białystok.
Results. The study showed that one in every nine nurses stated that they have no contact with contagious diseases in their everyday practice. Just over 30% of the nurses surveyed were convinced that their knowledge of contagious diseases and preparation to educate patients in that field is insufficient, and over half of the nurses had never trained patients in those matters. The study showed that almost 90% of the nurses surveyed had never educated patients in topics associated with tropical medicine, and the remaining 10% had done it "sporadically". The study demonstrated that the vast majority of students (90%) had not participated in patient education in tropical medicine. The majority of participating students (64%) believe that education for nurses in the area of tropical medicine is necessary.
Conclusions. Nurses' and nursing students' knowledge of contagious and tropical diseases is insufficient; but both groups are interested in broadening their knowledge of contagious diseases and tropical medicine (**Adv Clin Exp Med 2011, 20, 4, 461–471**).

Key words: tropical disease, knowledge, nurse.

Streszczenie

Wprowadzenie. W ostatnich latach, według aktualnych danych Światowej Organizacji Turystyki, rocznie ponad 150 mln podróżujących odwiedza kraje rozwijające się. Bardzo ważną rzeczą dla pracowników ochrony zdrowia (w tym pielęgniarek), którzy coraz częściej są narażeni na kontakt z klientami/pacjentami bądź chcącymi wyjechać do krajów tropikalnych, bądź z nich powracającymi, jest wiedza z zakresu chorób zakaźnych i medycyny tropikalnej.
Cel pracy. Ocena poziomu wiedzy pielęgniarek i studentów pielęgniarstwa w województwie podlaskim na temat chorób zakaźnych i medycyny tropikalnej.
Materiał i metody. Badanie przeprowadzono na podstawie kwestionariusza ankiet własnego autorstwa w grupie 500 pielęgniarek w województwie podlaskim i wśród 500 studentów pielęgniarstwa Uniwersytetu Medycznego w Białymstoku.
Wyniki. Wykazano, iż co dziewiąta pielęgniarka twierdziła, że w codziennej pracy nie styka się z chorobami zakaźnymi. Niewiele ponad 30% pielęgniarek było przekonanych, iż ich wiedza na temat chorób zakaźnych i przygotowanie do edukacji chorych w powyższym zakresie są wystarczające, a prawie połowa pielęgniarek nigdy nie szkoliła pacjentów na ten temat. Prawie 90% ankietowanych pielęgniarek nie prowadziło edukacji pacjentów na tematy

związane z medycyną tropikalną, a 10% czyniło to najczęściej „sporadycznie". Przeprowadzone badania własne wykazały, że zdecydowana większość studentów (90%) nie brała udziału w edukacji pacjentów z zakresu medycyny tropikalnej. Większość badanych studentów (64%) uważa, że kształcenie pielęgniarek obejmujące zagadnienia z medycyny tropikalnej jest konieczne.
Wnioski. Wiedza pielęgniarek i studentów pielęgniarstwa na temat chorób zakaźnych i tropikalnych jest niewystarczająca. Pielęgniarki i studenci pielęgniarstwa są zainteresowani poszerzaniem wiedzy z zakresu chorób zakaźnych i medycyny tropikalnej (**Adv Clin Exp Med 2011, 20, 4, 461–471**).

Słowa kluczowe: choroby tropikalne, wiedza, pielęgniarka.

Contagious diseases – or infectious diseases, to use the current nomenclature – still constitute a serious social problem, regardless of the level of a given society's technical progress and overall health. The profile and clinical presentation of those diseases is still evolving and will continue to evolve in the future [1]. Considering current globalization, the disappearance of borders and the mobility of populations, it is difficult to expect that the problem of infectious diseases will be limited to any single region. In May 2001 the World Health Assembly adopted the resolution *Global Health Security: Epidemic Alert and Response*, emphasizing the correlation between the globalization of trade and travel and the increased risk of infectious diseases [2, 3].

The problem also involves so-called tropical diseases, including contagious and parasitic conditions that are not generally observed beyond the tropical area [1]. The presence of those disease, limited to the zone between the Tropic of Cancer and the Tropic of Capricorn, is associated with specific climatic conditions, including high air temperature, high humidity and the potential for the multiplication and survival of numerous vectors, e.g. mosquitoes [4, 5]. At present the epidemiological status of typical tropical diseases is changing due to global warming (the so-called greenhouse effect), and diseases specific for tropical zones are appearing in new territories, outside that zone – for example Chikungunya hemorrhagic fever in Northern Italy, or Denga hemorrhagic fever in Turkey [6, 7].

According to current data published by the World Tourism Organisation, every year over 150 million travellers visit developing countries, including 52 million travelling to South Asia and Oceania, 31 million to Africa and approximately 37 million to Central and South America [8, 9]. One consequence of intensified tourism, emigration and military activity (conflicts and wars in tropical-zone countries, especially in Africa and the Middle East) is an increased possibility of tropical diseases developing in other regions [10]. Specific medical problems can arise in association with a temporary stay in different climatic, sanitary and epidemiological conditions. Hence, there is an increased prevalence of imported diseases [11].

Interventions by international organizations in local military conflicts lead to the formation of numerous international peacekeeping forces, and Polish personnel are often among the participants in UN and NATO military contingents. Considering the fact that tropical and subtropical areas where military forces and civil workers travel are characterized by different environmental conditions, there is a constant need for reliable information on health-related threats occurring in those particular parts of the world [12].

This translates into a need for increased attention, among both doctors and nurses, to problems associated with travel, and a need for more precise nursing diagnoses, which often contribute significantly to reaching a final diagnosis. Unfortunately, in the scientific literature there are few reports on contagious and tropical diseases in relation to professional nursing practice [13]. Therefore, a study evaluating the level of knowledge of tropical medicine and contagious diseases of nurses and nursing students seems justified.

Material and Methods

The study was based on two self-developed survey questionnaires distributed between 2008 and 2010. One questionnaire was completed by 500 nurses in the Podlaskie District of Poland and the other was taken by 500 nursing students at the Medical University in Białystok, following approval from the Ethical Committee of the Medical University in Białystok.

The survey for nurses was composed of seven questions aimed at providing a statistical characterization of the respondent, sixteen questions about the respondent's general knowledge of contagious diseases and nosocomial infections, and twenty-two questions regarding the respondent's general knowledge of tropical diseases.

The survey for nursing students was composed of six questions aimed at providing a statistical characterization of the respondent, twenty-five questions about the respondent's general knowledge of contagious diseases and nosocomial infections, and twenty-seven questions regarding the respondent's general knowledge of tropical diseases.

Results

The 500 nurses who participated in the survey were mostly women (88.8%), mostly aged between 31 and 40 (38%); the 500 nursing students surveyed were mostly women (91%), mostly aged between 20 and 30 (70%). The majority of the respondents lived in a city: 82.8% of the nurses and 77.4% of the students.

The majority of nurses (79.6%) had a college education, and 32.4% of them had professional experience of 21 to 30 years. The vast majority of them worked for hospitals (over 80%), outpatient care centers (7.0%) and medical rescue units (6.4%). Over half of them (56.2%) were regular staff nurses; 13.4% had specialized responsibilities and 9% had supervisory roles.

Over half of the surveyed students had no professional experience (54%), and the average professional experience of the others did not exceed 5 years, although there were individuals with much more extensive professional experience. Among the professionally active students the largest group (37%) worked for hospitals; 28% were regular staff nurses.

One in every nine nurses stated that they have no contact with contagious diseases in their work. The rest (90%) have contact with such diseases with varying degrees of frequency (Fig. 1).

Among the working students, 7.2% had no contact at all with contagious patients, 28% had sporadic contact, 8% had frequent contact and 4% had very frequent contact (Table 1).

Fewer than one-third of the nurses (32%) declared any knowledge of possible causes of outbreaks of contagious diseases in Poland; the possible causes they mentioned most often were inadequate hygiene (14.6%), "poisoned" food and water (4.8%), overpopulation (3.2%), diseases imported from other countries (2.8%) and a lack of protective vaccinations (2%). Fewer than half of the nurses could name microbes that can be used as biological weapons; the pathogens mentioned most often in that context were anthrax (50%) and botulinum toxin (10.2%).

Table 1. Students' contact with contagious patients at work

Tabela 1. Styczność studentów z zakaźnie chorymi w miejscu pracy

Responses (Odpowiedzi)	N	%	
Does not work (Nie pracuje)	255	50.9	
No contact at all (W ogóle)	36	7.2	15.3
Sporadic contact (Rzadko)	140	28.0	59.3
Frequent contact (Często)	40	8.0	16.9
Very frequent contact (Bardzo często)	20	4.0	8.5
No answer (Brak odpowiedzi)	9	1.8	

Almost half of the students (46.8%) were able to provide an example of microbes that can be used as biological weapons. Anthrax was mentioned by 31.4% of the students, smallpox by 7.4% and the Ebola virus by 4%, while 22% of the students were unable to give any answer.

Only 25% of the nurses surveyed were able to provide a correct definition of "sanitary cordon". Slightly better results were obtained when they were asked about the term "quarantine" – over half of them gave a correct answer.

Among the students, 15.6% gave a correct definition of "sanitary cordon", and 62.4% correctly defined "quarantine".

When asked whether nurses' knowledge of contagious diseases and preparation for patient education on that subject is sufficient, 34.4% of the nurses surveyed responded that it is. Almost half of the nurses had never educated patients on that subject (Fig. 2). Only 18 individuals (3.6% of the

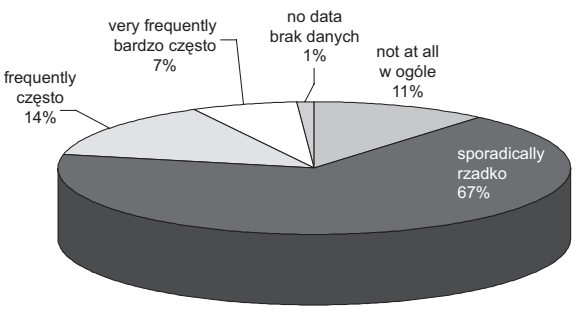

Fig. 1. Nurses' contact with contagious patients at work

Ryc. 1. Styczność pielęgniarek z chorobami zakaźnymi w miejscu pracy

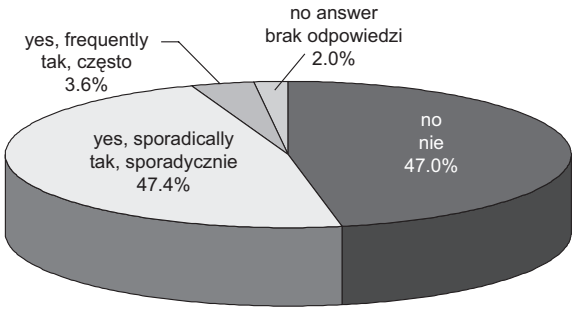

Fig. 2. Nurses' participation in educating patients regarding contagious diseases

Ryc. 2. Udział pielęgniarek w edukacji pacjentów na temat chorób zakaźnych

nurses surveyed) stated that they had frequently provided that type of education. Usually those were individual discussions with patients (0.8%), intra-departmental training or discussions during routine procedures (0.6% each).

When asked what issues should be subjects of patient education, the most commonly mentioned were: the prevention of contagious diseases (28.8%), the routes by which infections are spread (14.6%), hygiene issues (12.2%), indications for vaccinations (3.6%), signs and symptoms of contagious diseases (2.4%), complications (2.2%) and therapeutic options (2%). In the opinion of 60.2% of the nurses surveyed, educational tasks should be carried out by epidemiological nurses. Just over one-third of the nurses stated that such tasks should be performed by all nurses, and one in four considered it the doctor's job.

Another question was about students' participation in patient education regarding the occurrence and prevention of contagious and parasitic diseases. Just over one-third of the students stated that they had participated in such education, the majority of them "sporadically"; almost 60% said they had never been involved (Figure 3).

The nurses' self-evaluation of their knowledge of nosocomial infections was higher than in the case of contagious diseases. Almost half of them (45.4%) believe that their knowledge is sufficient. However, their activity in the field of providing information about nosocomial infections to patients was as low as in case of contagious diseases. Only 48.4% had done it sporadically, 5.8% frequently and 45.4% never.

When asked what topics were fundamental in educating patients about nosocomial infections, among the topics that the nurses mentioned most frequently were: prophylaxis in the broad sense of the term (17.6%), the principles of hygiene (13.8%), the routes of infection (6.8%), behavior principles for the patients to follow during hospitalization (4.8%) and signs and symptoms of selected diseases, including AIDS, viral hepatitis and "dirty hands diseases" (1.6% each). The majority of the respondents stated that these educational tasks should be the responsibility of epidemiological nurses (58.6%); fewer stated that they should be performed by every nurse (33.2%) or by a doctor (23.6%).

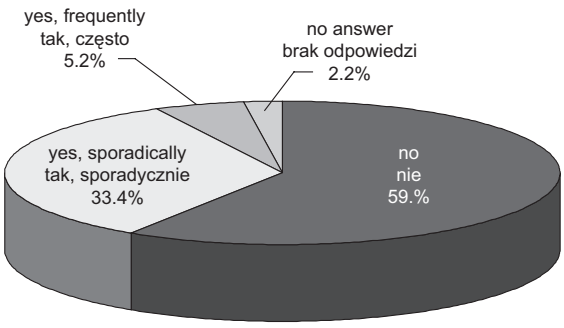

Fig. 3. Students; participation in educating patients regarding contagious diseases

Ryc. 3. Udział studentów w edukacji pacjentów na temat chorób zakaźnych

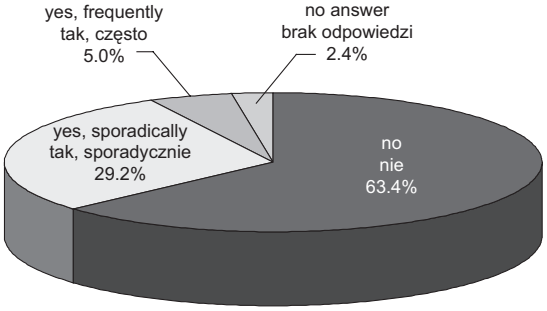

Fig. 4. Students' participation in educating patients regarding nosocomial infections

Ryc. 4. Udział studentów w edukacji pacjentów na temat zakażeń szpitalnych

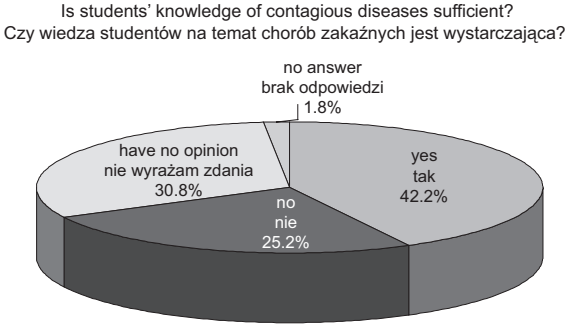

Fig. 5. Students' knowledge of contagious diseases

Ryc. 5. Wiedza studentów pielęgniarstwa na temat chorób zakaźnych

The majority of students (63.4%) had never participated in patient education on the occurrence and prevention of nosocomial infections, and 29% had participated sporadically (Fig. 4). Over half of the respondents stated believed that nursing students' knowledge of nosocomial infections was insufficient, and inadequate for patient education in that area.

Another question was whether nursing students' knowledge is sufficient to educate patients regarding contagious and parasitic diseases. The students rated their knowledge of contagious diseases rather positively (42.2%), and only one in four (25%) believed that their knowledge was insufficient for patient education (Fig. 5).

Three-fourths of the nurses surveyed stated that they could provide examples of tropical diseases (75.2%); examples were actually provided by

72% of respondents. The diseases most often mentioned were: malaria (61.4%), hemorrhagic fever (19.6%), typhoid fever (15.4%), cholera (14.8%), amoebiasis (12.6%), febra (11.4%), plague (9%) and leprosy (2.4%).

Almost three-fourths of the students could give an example of a tropical disease; most often they mentioned malaria (64%). Six individuals claimed to know examples of tropical diseases but gave none.

Over half of the surveyed nurses (53.6%) stated that they know prophylactic principles that should be applied before travelling to tropical countries; the one they mentioned most often was protective vaccination (53.2%).

Approximately half of the students surveyed (52.4%) stated that they know "some" prophylactic principles to follow before a trip to the tropics. Vaccinations were mentioned by 54% of them.

When asked what factors need to be considered when making recommendations to a given individual who is planning to travel to a tropical country, 31.6% of the nurses provided answers: 9% mentioned the traveller's general condition, 3% mentioned diseases known to be present in the given country and 2.8% mentioned the conditions likely to be encountered there (2.8%).

Only 33.8% of the nurses participating in the survey provided examples of actual recommendations for travellers to follow en route to a tropical country; the ones most commonly mentioned were "sensible intake of food and beverages" (18.6%), "adequate hygiene" (7.6%), "appropriate clothing" (1.6%), appropriate anti-insect agents (0.4%) and "thorough education on the possible dangers" (0.2%) (Table 2).

Among the students, 140 (28%) declared that they know prophylactic principles to follow before a trip to a tropical country, but only one in five (19.2%) were able to recall any (Table 3). A slightly higher percentage of the students (20.4%) could provide recommendations to follow en route to a distant destination.

Awareness of recommended principles for the duration of a stay in the tropics was declared by 32% of the students surveyed, but only 28.6% of them provided examples; 22% mentioned caution regarding food and drink, and 5% mentioned adequate hygiene.

A relatively high percentage of the students (37.2%) could provide examples of principles to follow after coming back from the tropics. The most commonly mentioned principle (19%) was "doing basic laboratory tests".

Among nurses, knowledge of recommendations for the duration of a stay in the tropics was

Table 2. Nurses' knowledge of recommendations to follow en route to a tropical country

Tabela 2. Znajomość zaleceń na czas podróży do krajów tropikalnych zgłaszanych przez pielęgniarki

Knowledge of recommendations to follow en route (Znajomość zaleceń na czas podróży)	N	%
Yes (Tak)	169 (148)	33.8 (29.6)
No (Nie)	325 (346)	65.0 (69.2)
No answer (Brak odpowiedzi)	6	1.2%

Table 3. Students' knowledge of prophylactic principles to follow before travelling to tropical countries

Tabela 3. Znajomość zasad profilaktyki przy wyjeździe do krajów tropikalnych zgłaszanych przez studentów pielęgniarstwa

Knowledge of prophylactic principles to follow before travelling to tropical countries (Znajomość zasad profilaktyki przy wyjeździe)	N	%
Yes (Tak)	140 (96)	28.0 (19.2)
No (Nie)	354 (398)	70.8 (78.6)
No answer (Brak odpowiedzi)	6	1.2
En-route recommendations mentioned (Wymieniane zalecenia na czas podróży)	**N**	**%**
Sensible intake of food and beverages (Uważanie na pokarmy, napoje)	93	18.6
Adequate hygiene (Higiena)	38	7.6
Appropriate clothing (Odpowiednie ubrania)	8	1.6
Travelling with essential drugs/ first-aid kit (Niezbędne leki, apteczka)	6	1.2
Using appropriate anti-insect agents (Środki przeciw insektowe)	2	0.4
Thorough education on the possible dangers (Wszechstronna edukacja na temat zagrożeń)	1	0.2

declared by 36.2%; their specific suggestions included caution regarding food and water (23%), adequate hygiene (5%), the use of protective clothing (1.2%), prevention of bites and injuries (1%), taking appropriate drugs (0.6%) and choosing to stay only in places with high standards (0.4%).

Almost 40% of the nurses surveyed nurses could provide examples of recommendations for a person who had returned from a tropical country. Those included: basic laboratory tests (16.6%), self-observation (12.6%), reporting to a specialist for tests (3.6%), quarantine (2.6%) or a visit to a GP (0.2%).

Only 20% of the nurses stated that travel to tropical countries is popular, and 17.1% of them reported feeling they have insufficient information on issues related to travel to the tropics. One in six nurses (15.8%) stated that they would be interested in undergoing practical training in a tropical country (Table 4). Only 9.2% of the nurses were interested in improving their qualifications in the area of tropical diseases.

Among the students surveyed, 62% expressed an interest in extra education in the area of tropical medicine. It is notable that 28.5% of the individuals interested in improving their knowledge wanted to do so in order to "broaden their knowledge"; another 15% gave "the popularity of travel to tropical countries" as the reason, and 10% stated that the knowledge would be useful for "providing information to travellers to tropical countries".

The students' interest in travel to a tropical country for practical training was rather high: Affirmative answers were given by 219 individuals (43.8%), most of whom stated that the main reason was the possibility of broadening their medical knowledge (Table 5).

The majority of nursing students (65%) felt that education about tropical medicine is necessary for nurses nowadays (Fig. 6). The most common reasons given for that opinion were that an "increasing number of people travel to the tropics" (10%) and that "a nurse has to be comprehensively educated" (9%) (Table 6).

Only a small percentage of professionally active nurses had been involved with educating patients about tropical medicine for patients (9.6%), and in most cases that involvement was sporadic (Table 7).

The majority of the nurses surveyed could not suggest any issues in that field that should be included in an educational program for healthy people. One person in five (17.6%) mentioned prophylactic principles as a potential subject.

In the opinion of the majority of the nurses surveyed, educating patients about tropical diseases should be the responsibility of epidemiological

Table 4. Nurses' interest in practical training in a tropical country

Tabela 4. Zainteresowanie pielęgniarek wyjazdem na praktykę do krajów tropikalnych

Nurses' interest in practical training in a tropical country (Zainteresowanie pielęgniarek wyjazdem na praktykę do krajów tropikalnych)	N	%	
Yes (Tak)	79	15.8	
Useful experience (Przydatne doświadczenie)	18	3.6	22.8
Urge to travel (Ciekawość świata)	18	3.6	22.8
Good way to acquire practical knowledge (Dobry sposób na zdobycie praktycznej wiedzy)	9	1.8	11.4
No reason given (Nie podano uzasadnienia)	34	6.8	43.0
No (Nie)	246	49.2%	
It's dangerous (Jest to niebezpieczne)	21	4.2	8.5
Family-related issues (Ze względu na rodzinę)	14	2.8	5.7
Climate-related issues (Ciężki klimat)	10	2.0	4.1
Age-related issues (Ze względu na wiek)	6	1.2	2.4
I'm not interested in tropical medicine (Nie interesuje mnie ta tematyka)	4	0.8	1.6
I want practical training in Poland (Chciałabym je odbyć w Polsce)	1	0.2	0.4
Language barrier (Brak znajomości języka)	1	0.2	0.4
Danger of tropical diseases (Zagrożenie chorobami tropikalnymi)	1	0.2	0.4
No reason given (Nie podano uzasadnienia)	188	37.6	76.4
I don't know (Nie wiem)	168	33.6	
No answer (Brak odpowiedzi)	7	1.4	

Table 5. Nursing students' interest in practical training in a tropical country

Tabela 5. Zainteresowanie studentów pielęgniarstwa wyjazdem na praktykę do krajów tropikalnych

Nursing students' interest in practical training in a tropical country (Zainteresowanie studentów pielęgniarstwa wyjazdem na praktykę do krajów tropikalnych)		N	%	
Yes (Tak) (N = 219; 43.8%)	good way to acquire practical knowledge (sposób na zdobycie praktycznej wiedzy)	66	13.2	30.1
	useful experience (przydatne doświadczenie)	36	7.2	16.4
	urge to travel (poznanie świata)	17	3.4	7.8
	very interesting (bardzo interesujące)	7	1.4	3.2
	to help the people living there (aby pomóc żyjącym tam ludziom)	1	0.2	0.5
No (Nie) (N = 132; 26.4%)	it's dangerous (jest to niebezpieczne)	18	3.6	13.6%
	climate-related issues (ciężki klimat)	7	1.4	5.3
	family-related issues (ze względu na rodzinę)	7	1.4	5.3
	I want practical training in Poland (chciałabym je odbyć w Polsce)	3	0.6	2.3
	too little knowledge of tropical diseases and their treatment (mała wiedza o tych chorobach, leczeniu)	1	0.2	0.8
I don't know (Nie wiem)		143	28.6	
No answer (Brak odpowiedzi)		6	1.2	

nurses (59%); a smaller percentage felt it should be the doctor's responsibility (28%), or any nurse's (19.4%).

Over half of the nurses (53%) stated that in-service education in tropical medicine is needed for nurses (Fig. 7) and that they themselves have insufficient knowledge in that field (25.6%).

The majority of the nurses surveyed (84.4%) listed the Internet as a source of knowledge of tropical medicine. Other sources of information mentioned were training courses (28%), books and magazines (15.8%), intra-hospital training programs (15.6%) and special courses (12.8%).

The survey indicated that the vast majority of students (90%) had not participated in any patient education in tropical medicine. According to students (52%), nurses' knowledge of tropical diseases is insufficient (Figure 8) and does not permit nurses to educate patients in that area.

Among the issues associated with tropical medicine that students would like to learn about during their education and which should be a basic subject in patient education, the one most frequently mentioned was prophylaxis (29%). In the opinion of half of the students (50%), patient education in this area should be dealt with by epidemiological nurses; smaller percentages said it should be done by any nurse (37%) or by doctors (27%).

Just over one quarter of the surveyed students (28%) stated that their studies included "any" information concerning tropical diseases, in the following courses: parasitology (11%), epidemiology (7%), contagious diseases (2%) and hygiene and epidemiology (2%). Only a small percentage of the students (6.8%) believed that the information provided during the course of their studies was sufficient. The participating students suggested that additional information on tropical diseases could be provided as a part of the existing epidemiology curriculum, or by establishing a new program in tropical medicine.

Table 6. Students' opinions on the importance of education about tropical medicine

Tabela 6. Opinie studentów na temat zasadności kształcenia z zakresu medycyny tropikalnej

Responses (Odpowiedzi)	N	%
More and more people are travelling to tropical countries (Coraz więcej ludzi wyjeżdża do tropików)	52	10.4
A nurse has to be comprehensively educated (Pielęgniarka musi być wszechstronnie wykształcona)	46	9.2
I may encounter a patient with that type of disease in my ward (Mogę zetknąć się z tak chorą osobą na oddziale)	13	2.6
It should be offered for those with a particular interest (Ale dla osób zainteresowanych)	9	1.8
It may be useful in the future (Może się przydać w przyszłości)	7	1.4
There are many people from tropical countries in Poland (W Polsce jest wiele osób z tropików)	6	1.2
It should be offered, but only on a general level (Ale tylko ogólnie)	5	1.0
No reason given (Brak uzasadnienia swojego poglądu)	362	72.4

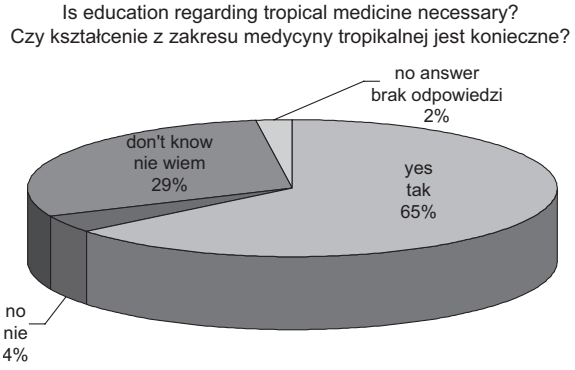

Fig. 6. Students' opinions on the importance of education about tropical medicine

Ryc. 6. Opinie studentów na temat kształcenia z zakresu medycyny tropikalnej

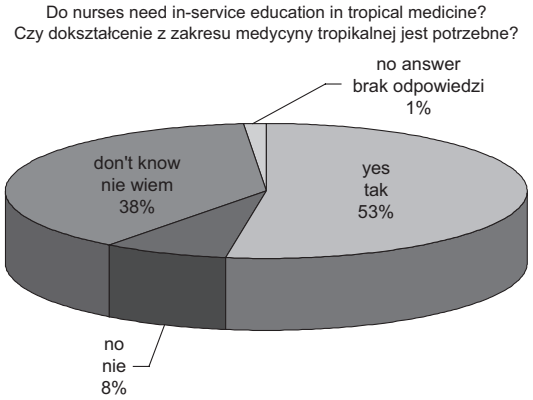

Fig. 7. Nurses' opinions on the need for in-service education in tropical medicine

Ryc. 7. Opinie pielęgniarek na temat dokształcenia z zakresu medycyny tropikalnej

Discussion

Polish citizens are travelling more and more often to tropical countries. The extensive offers of travel agents, professional contacts, personal interests and the urge to travel to exotic places lead thousands of tourists to visit African, Middle Eastern and Far Eastern countries [14].

At the beginning of the 20th century the opinion was formulated that it is possible to completely eliminate contagious diseases. That was supposed to be due to increasing progress in all fields, the improvement of sanitary conditions, the development of protective vaccinations and the synthesis of new antimicrobial agents [6].

The share of contagious diseases in the global disease load (including perinatal diseases and malnutrition) is estimated at approximately 39% [15, 16]. Current statistical data indicate that contagious diseases remain the main cause of death of newborns worldwide (approximately 17 million deaths a year), especially in poor and developing countries [16].

Therefore, this study's finding that one in nine nurses claimed to have no contact with contagious

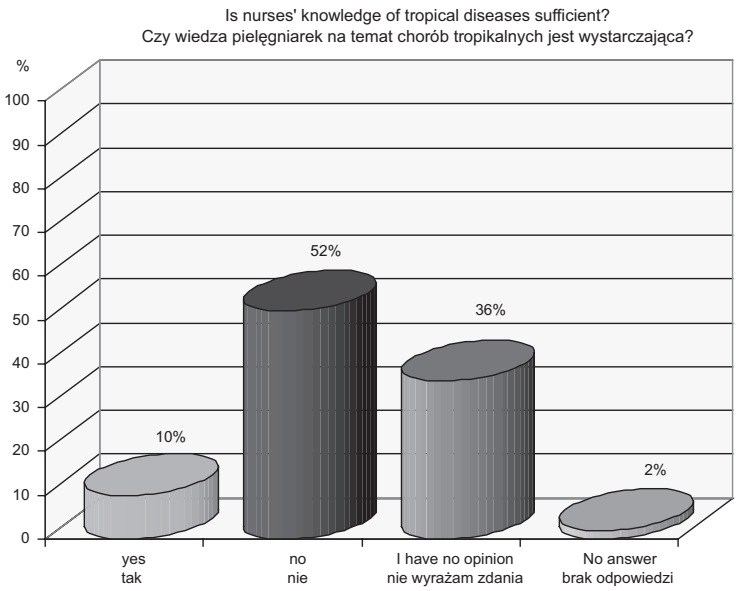

Fig. 8. Students' opinions regarding nurses' knowledge of tropical diseases

Ryc. 8. Wiedza pielęgniarek na temat chorób tropikalnych w opinii studentów

Table 7. Nurses' participation in teaching patients about tropical medicine

Tabela 7. Udział pielęgniarek w szkoleniach dla pacjentów z zakresu medycyny tropikalnej

Participation in teaching patients about tropical medicine (Udział w szkoleniach dla pacjentów z zakresu medycyny tropikalnej)	N	%	
No (Nie)	438	87.6	
I am not prepared (Nie posiadam przygotowania)	41	8.2	9.4
No time (Brak czasu)	8	1.6	1.8
The need hasn't arisen (Nie było takiej potrzeby)	119	23.8	27.2
No such program for patients has been offered (Nie było takiego szkolenia)	35	7.0	8.0
No reason given (Nie podano uzasadnienia)	235	47.0	53.7
Yes, sporadically (Tak, sporadycznie)	48	9.6	
Yes, frequently (Tak, często)	2	0.4	
No answer (Brak odpowiedzi)	12	2.4	

diseases in their everyday work is disturbing, that under half of the nurses knew what could cause an epidemic outbreak in Poland, and that only 25% of those surveyed could give a correct definition of a sanitary cordon (although the term "quarantine" caused fewer problems); in the case of students, only 15.6% could give a correct definition of a sanitary cordon, and 62.4% of "quarantine". That could indicate a lack of basic knowledge of epidemiology.

Increasing globalization means an increase in migration and travel. The number of people who temporarily change their place of residence increased from 25 million worldwide in 1950 to an estimated one billion by 2010 [18]. Factors involved in the distribution, clinical presentation and spreading of contagious diseases, including tropical ones, are the geographic and climatic location of a country; its political and economic

situation; the organization and financing of the healthcare system; increasing population, including the overpopulation of cities; sanitary conditions, including access to fresh water, removal of waste, local cultural customs and behavior; standards of sexual behavior; and the presence of drug addiction, alcoholism and crime [6]. For travellers to tropical countries, all those factors, combined with poor travel conditions within the country itself, changes in food quality and eating habits, high temperature, high humidity, excessive physical exercise in a hot and humid climate, and a lack of knowledge of numerous risk factors can constitute serious health threats [18].

Travel to tropical countries should be carefully considered and planned, and prophylactic recommendations should take into account the traveller's age and health, the particular region and environment, the climatic conditions during the given season of the year, the conditions of the stay (hotel, tent, access to fresh water, etc.) and possible local risk factors, which are often difficult to foresee. It is necessary to have appropriate clothes and shoes for the climate and to protect against dangerous insects (particularly mosquitoes), arachnids and/or other animals [19, 20].

It must be borne in mind that the equatorial climate can be very taxing for Europeans, particularly for those who easily overheat and/or have insufficient respiration, for example obese individuals [21]. Unfortunately, decisions to travel to distant countries are often made impulsively, guided by advertisements, "last minute" offers, and usually without appropriate medical preparation or knowledge of local health-related threats, even by elderly people, patients with chronic respiratory or circulatory conditions, pregnant women and parents with young children [22].

For all of these reasons, there is an increasing need for a broader knowledge of tropical diseases and prophylaxis among medical personnel, including nurses. Therefore, adding courses on tropical medicine to the curriculum in Polish nursing schools, and introducing post-diploma training in tropical diseases for nurses seems justified [23].

In the current study, approximately 17% of the nurses suggested that professional sources and mass media contain insufficient information on issues associated with tropical diseases. That is consistent with observations made by Buczyński et al., who noted that published reports about the epidemiology of diseases and injuries occurring in the Middle East are very scarce and of a general nature, both in world literature and in publications available in that region [12].

Castelli et al. showed that over 70 million people from industrialized countries travel to tropical countries every year and that over 50% of them suffer from various types of infections, from a mild diarrhea to severe forms of malaria [24]. Studies by other authors confirm a clear correlation between increased morbidity from parasitic diseases in hot climates and negligence of basic principles of hygiene and prophylactics aimed at reducing the risk of getting sick [25]. It has also been demonstrated that parasitic diseases predominate among tropical diseases; mortality from them is estimated at approximately 2.5 to 3 million a year [25]. Unfortunately, the level of knowledge of the risks encountered in tropical countries is very low among travellers [26, 27]. The current study demonstrated that over half of the surveyed nurses and nursing students feel that extra education in tropical medicine is necessary, for they do not have adequate knowledge to offer patients much-needed education in that area.

The authors concluded that Polish nurses and nursing students have insufficient knowledge of contagious and tropical diseases and are interested in broadening their knowledge in these areas. Expanding nursing school curricula and introducing post-diploma training to provide education on tropical medicine in faculties seems necessary and justified.

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