



International Travelers' Behaviors and Knowledge of Travel Health, Travel-Related Diseases, and Vaccinations: A Cross-Sectional Study



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Abstract

Introduction: Travel health centers offer very important health services for individuals traveling abroad. Little is known about the health status and knowledge of travel health, travel-related diseases, and vaccinations of individuals who travel abroad and visit travel health centers. This research studied travelers who visited a travel health center in order to evaluate their behavior and knowledge of travel health, travel-related diseases, and vaccinations.

Methods: This cross-sectional study was conducted with 407 participants between June and September 2018, the busiest time for international travel. It was administered at a travel health center attached to the Directorate General of Health for Border and Coastal Areas of Turkey.

Results: The results indicated that 78.6% of participants did not obtain travel health insurance before their trip, and 63.6% did not prepare a travel health kit for their trip. Moreover, 61.4% reported that they did not know about the health conditions and practices of their destination country. Individuals traveling for business did more research on travel-related diseases compared to those traveling for other reasons. Additionally, 61.3% of individuals who rated themselves healthy sought information about the health conditions at their travel destinations.

Conclusion: The current study showed that the knowledge and healthcare practices among international travelers are inadequate. Raising awareness is needed to create a positive behavioral change in people's travel health practices.

Keywords: Travel, Travel-Related Illness, Health Services, Vaccination

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Introduction

To keep up with the current age where the world has turned into a global village, it has become necessary for many individuals to travel for various purposes. Holiday travel has also become much more common with the increasing income levels in the current atmosphere of rapid globalization and commercialization. The number of international travelers and tourists increases every year. By 2030, the annual number of travelers is estimated to reach nearly 2 billion globally.^{1,2} This increase has drawn more attention to the attitudes, practices, and knowledge of travelers regarding travel healthcare, travel-

related diseases, and vaccinations.^{3,4} Increasing mobility leads individuals to better research the health conditions of their destinations. Many websites provide information about the health conditions of countries, even information about such events as floods, storms, hurricanes, earthquakes, and the risks of these events for health as well as related news.¹ The current trend indicates that the sources of information on travel health will increase and diversify in the future.⁵

To lead a healthy life, an individual should have appropriate housing, an adequate and balanced diet, an adequate level of income to access resources, and good habits affecting health,

education, employment, working conditions, and genetic characteristics. Other factors also affect the health status and the healthy living of an individual over time. An individual's healthy living during travel can be explained by the function below (function refers to a relation that involves independent variables).¹⁻⁵

The healthy living of an individual during travel = f {Destination Country/Home Country (health service, environment, lifestyle, gender, age, educational level, marital status, income, diet, housing conditions, epidemics and infectious diseases, health status of the individual and his/her place among disadvantaged groups, duration of travel, possible health risks).¹⁻⁵

The current study is structured in the context of the variables in the function above. These variables may change depending on the country of destination.⁵ Most previous studies on travel health have been carried out at airports in various countries and have shown that most travelers are unaware of health risks and do not take necessary preventive measures nor seek health advice before traveling.⁶⁻⁹ Identifying health risks that may occur during a trip, giving individuals information about these risks and prevention procedures, and offering counseling about the effective management of travel diseases are important components of travel health services.

As noted in the literature, approximately 64%-87% of individuals become ill during travel.^{10,11} When the issue of traveling is considered with many variables, it may turn into a predisposing factor for communicable and non-communicable diseases, a facilitator for the spread of these diseases, or a precipitating factor for the symptoms of diseases. Many people experience vaccine-preventable diseases. It is known that travelers frequently encounter conditions such as malaria, dengue, enteric fever, influenza, and Ebola,^{12,13} diarrhea, vomiting, nausea, and dermatological problems.^{10,14} It has been reported that individuals who received counseling from health professionals before traveling showed more risk reducing behavior.^{15,16} The number of factors affecting the health of an individual during travel is high, yet there is no comprehensive data in the international literature on the characteristics of individuals who visit travel health centers or on their attitudes, behavior, and knowledge of travel health, diseases, and vaccinations.¹²⁻¹⁶ Being the most comprehensive research conducted within the scope of travel health centers, the current study can contribute to addressing the gaps in the knowledge and practice of travelers and to developing travel health services.

Methods

Study Setting

This study was administered at a travel health center attached to the Directorate General of Health for Border and Coastal Areas of Turkey. As well as issuing international vaccination certificates, this center provides services to citizens such as health examinations before traveling, counseling about health problems that may arise during travel and prevention, medicines that may be needed during travel, and vaccinations. The current study was conducted with 407 participants between June 1 and September 30, 2018, the busiest months

for international travel.

Study Design

This research was designed as a cross-sectional and descriptive study.

Study Population

The study group was composed of individuals 18 years old and older who visited the travel health center.

Inclusion and Exclusion Criteria

This cross-sectional study was conducted on a voluntary basis with individuals who referred to the travel health center and agreed to take part in the survey. Travelers under the age of 18 were excluded from the study.

Sampling Techniques

The study sample consisted of purposively selected 407 individuals who visited a travel health center between June and September 2018 and agreed to take part in the research.

Data Collection

A questionnaire was developed by the researcher using previous surveys and information available in the literature for its preparation. The questionnaire was pilot tested to ensure that the questions were understandable. The survey was structured on individuals' healthy living function during travels and the factors within this context.

The questionnaire inquired about travelers' socio-demographic characteristics (age, gender, education, marital status, income, etc), characteristics of travel (destination, days planned, purpose of travel, etc), and their practices and knowledge of travel and routine vaccinations. The health conditions and risks of the destination country were assessed. The participants' attitudes and behaviors of travel healthcare were also assessed. The questionnaire consisted of 100 questions, and respondents completed and returned the questionnaires in about 20 minutes. The questionnaires were distributed to travelers with or without an appointment in the waiting room of the travel health center between 09:00 and 19:00 hours. The returned questionnaires were checked for unanswered questions.

To assess the reliability of the questionnaire results, consistency analyses were carried out using SPSS 21 software. There was a relatively high internal consistency with a Cronbach α value of 0.927, which was considered acceptable.

Data Analysis

Data management and analysis were performed using SPSS for Windows (version 21.0). Descriptive statistics were used in analyzing the data. Pearson's chi-square tests were conducted for all cross-tabular data. When the expected cell count was <5 , Fisher exact test was used.

Results

The demographic data and travel characteristics of the respondents were presented first. The characteristics of the respondents' travel healthcare behavior and the perceived risk

of travel-related diseases were provided next. The relationship between the characteristics of the travelers and their self-reported healthcare practices before traveling were assessed last.

Of the individuals surveyed, 82.1% were men, and 61.6% held a master's degree or Ph.D. The mean age of the participants was 36.00 ± 10.30 years with ages ranging from 18 to 71 years. The annual income of 44.2% of the respondents ranged between US\$10000 and US\$15000. 63.6% of the participants were married, 61.5% were working in the public sector, and 23.8% were employed in the private sector.

From Table 1, it can be seen that 44.7% of the study participants planned to go abroad for 45 days or less. The most commonly reported travel destinations were Somalia (12.5%) in Africa, Afghanistan (47.3%) in Asia, Brazil (38.9%) in America, and Finland and Kosovo (14.3% each) in Europe; 86.5% of the participants were going to their chosen destinations for the first time. Multiple purposes for travel were reported; the most common reasons were business (73.7%) followed by holiday (12.8%), voluntary work/aid programs (9.3%), and education (4.2%).

Table 2 indicates that 34.4% and 32.9% of participants reported that they began preparing for their trip at least one month and 1-2 weeks in advance, respectively. Information about the destination country was sought prior to travel by 89.9% of the respondents. The types of frequently sought information were, in order, health information, weather, lifestyles, accommodation, transportation, crime rates, rural-urban status, and places of entertainment. Travel health or diseases were researched by 78.1% of participants. Those who did not seek information cited the following as their reasons: I'm too busy (36%), I didn't consider it necessary (27%), I don't think I'm at risk (23.6%), I don't know what to do (11.2%), and I don't know where to ask (2.2%). Of the participants, 63.6% did not prepare a travel health kit, but 36.4% did. Furthermore, 61.4% did not know the health practices of the country they planned to travel to, but 38.6% did. Travel health insurance for their destinations and personal first aid kits for travel were not obtained by 78.6% and 78.9% of participants, respectively. While 72.2% thought that there could be health risks in the country they planned to visit, 27.8% saw no risks. While 38.1% of participants did not have a risk management plan, 34.6% had a plan for some risks, 13.8% did not see any risks, and 13.5% had a plan for many risks. Overall, 58.3% of participants rated themselves healthy, and 28.1% rated themselves very healthy.

When the risk perception for travel-related diseases among the travelers is reviewed, the highest rates were seen for malaria (72.8%), typhoid fever (63.1%), yellow fever (52.8%), hepatitis B (51.3%), hepatitis A (50%), and tetanus (40.4%). Travelers planning visits to countries in Africa viewed malaria, typhoid, and yellow fever, in that order, as the highest risks. Individuals going to countries in Asia viewed hepatitis B as a risk. Individuals going to Europe or America did not deem hepatitis a risk, but 58.5% of those going to Africa and 36.9% of those going to Asia viewed hepatitis A as a risk. Vaccines were considered by 60.5% of the respondents as providing

basic protection; 35.7% said that they were safe, 3% said that they had side effects, 0.6% said that they were not necessary, and 0.2% said that they were ineffective.

No statistically significant difference was observed between travelers' seeking information on travel-related diseases and their gender, age, or educational status ($P > 0.05$).

An examination of the relationship between travelers'

Table 1. Demographic and Travel Characteristics of the Travelers

Characteristics (n = 407)	No.	%
Sex		
Female	73	17.9
Male	334	82.1
Age (y)		
18-32	165	40.5
33-40	112	26.6
>41	130	31.9
Mean \pm SD	36.00 \pm 10.30	
Educational level		
High school and lower	35	8.6
2-Year vocational school/bachelor's degree	120	29.5
Master's degree/Ph.D.	252	61.5
Marital status		
Married	259	63.6
Single	148	36.4
Income level (annual)		
US\$10000 and lower	109	26.8
US\$10001-15000	180	44.2
US\$15001 and over	118	29.0
Occupation		
Public sector	250	61.4
Private sector	97	23.8
Student	60	14.7
Travel destination*		
America	18	4.4
Europe	7	1.7
Africa	235	57.8
Asia	147	36.1
How many days planned		
45 days or less	182	44.7
46-180 days	132	32.4
181 days or more	93	22.9
Purpose of travel		
Business	300	73.7
Education	17	4.2
Holiday	52	12.8
Volunteering/help program	38	9.3
First time to visit destination		
Yes	352	86.5
No	55	86.5

*There were no travelers going to other continents.

Table 2. Travel Healthcare Practices of the Travelers

(n=407)	No.	%
Preparation for traveling		
At least 1 month in advance	140	34.4
3-4 weeks in advance	55	13.5
1-2 weeks in advance	134	32.9
During the week prior to travel	67	16.5
Other	11	2.7
Sought information about travel destination		
Yes	366	89.9
No	41	10.1
Type of information sought*		
Weather forecast	213	15.7
Altitude	52	3.8
Rural/Urban situation	74	5.5
Lifestyles	176	13.0
Prices	140	10.3
Accommodation	164	12.1
Transportation	135	10.0
Places of entertainment	59	4.4
Crime rates	116	8.6
Health information	225	16.6
Sought information about travel health and diseases		
Yes	318	78.1
No	89	21.9
Reasons for not seeking information about travel health and diseases (n=89)		
I did not consider it necessary	24	27.0
I am too busy	32	36.0
I don't think I am at risk	21	23.6
I don't know what to do	10	11.2
I don't know where to ask	2	2.2
Preparation of a travel health kit		
Yes	148	36.4
No	259	63.6
Knowledge of health practices in the country of destination		
Yes	157	38.6
No	250	61.4
Obtained travel insurance for the country of destination		
Yes	87	21.4
No	320	78.6
Presence of possible health-related risks in the country of destination		
Yes	294	72.2
No	113	27.8
Obtained a personal first aid kit for travel		
Yes	86	21.1
No	321	78.9
Have a health-related travel risk management plan		
I don't see any risk	56	13.8
I don't have any risk plan	155	38.1
I have a plan for many risks	55	13.5
I have a plan for some risks	141	34.6
Opinions about travel vaccines*		
They provide basic protection	286	60.5
They are safe	169	35.7
Not necessary	3	0.6
Ineffective	1	0.2
They have side effects	14	3.0
Perceived health		
Very healthy	114	28.1
Healthy	238	58.3
Normal	54	13.4
Unhealthy	1	0.2

*Multiple response question.

characteristics and self-reported healthcare practices before traveling revealed a statistically significant association between seeking information on travel-related diseases and making a health-related travel risk management plan ($P < 0.05$). Table 3 shows the results of the correctional analysis. As seen in the table, 70.1% of those traveling for business researched travel diseases, and 78.2% had plans for many risks. Interestingly, 47.8% of travelers who planned to stay abroad for 45 days or less researched travel health and diseases, of which 51.8% had plans for some risks. Risk perception decreased as the duration of staying abroad increased. Among individuals who rated themselves as healthy, 61.9% researched travel diseases, of which 61.3% had no risk plan; 46.4% of the individuals who rated themselves as very healthy did not see any risks.

Discussion

This cross-sectional study was conducted at a travel health center and sought to examine travel health knowledge and practices of international travelers. The respondents comprised a young population who rated themselves as healthy, and the majority of them had a bachelor's degree or higher level of education. The study found that most of the respondents worked in the public sector. Most of them were going to their destinations for the first time and for a short visit. Reasons given for travel, mainly to Africa and Asia, were mostly for business, followed by holiday, volunteering, and training (Table 1). About two-thirds of the individuals traveling for business sought information on travel diseases and had plans for many health risks ($P < 0.05$).

Unlike the findings of the current study, Al-Abri et al¹⁷ identified the travelers' purpose of visit primarily as tourism. Their respondents reported family members and friends as the most common source of information about their trips.¹⁷ In another study, Angelo et al¹⁰ determined that travelers traveled mainly for tourism and vacation and frequently to Asia and Africa. The reason why business was found to be the most common reason for traveling in the current study may be that the agencies that travelers worked for obligated them to visit the travel health center before departure. Long-term trips and visits to African countries can also be emphasized as reasons leading individuals to seek advice. The current study found that married individuals preferred to stay abroad more than single ones. A possible explanation for this might be that they can take family members with them while going abroad for business. For this reason, it is important that married individuals and their family members are informed about travel health at travel health centers before going abroad and vaccinated, if necessary. The results of the current study showed that approximately half of the individuals started to prepare for their international travel at least 15 days in advance; this result is consistent with those stated in the relevant literature.¹⁷ It was found that 89.9% of the surveyed travelers sought information about their destinations. A study conducted by Hung et al¹⁸ identified a statistically significant association between going abroad for more than 28 days and seeking advice before traveling. In the current study, it was found that risk perception decreased trip

duration increased; 52.4% of individuals planning to travel abroad for 45 days or less had plans for some health risks. As the duration of stay increased, the number of individuals with a plan for health risks decreased. This relationship was statistically significant too ($P < 0.05$). As shown in Table 2, the leading topics of interest about the destination country prior to travel included, in order, health information, weather, lifestyle, accommodation, prices, and transportation. Selçuk et al¹⁹ reported that only 11.3% of their participants researched travel health. The individuals who did not seek information about their destination stated their reasons as they were too busy, they did not consider it necessary, or they did not think that they were at risk. Similarly, Poksiri et al¹¹ found in their study that although the vast majority of travelers had positive attitudes toward the uptake of health advice and vaccination before traveling, only a small number of travelers practiced them.

The findings of the current study show that the preparedness of individuals for a healthy trip abroad is insufficient. Although a significant number of travelers (72.2%) thought that there were situations that might be risky to health at their destination, they did not make any risk plans for travel risks or recognize any risks. A high number of travelers did not know the health practices of the country they planned to visit. Prior to traveling, 78.6% did not obtain travel health insurance, and 63.6% prepared neither a travel health bag, nor a personal first aid kit (78.9%). At this point, these findings differ from previous studies. For example, a study conducted by Hung et al identified that 72.1% of the travelers had travel insurance and 48.7% had first aid kits.¹⁸ The differences between the results could be attributed to various dependent/independent variables as well as cultural factors. Immunization is one of the key elements of travel medicine.²⁰ The findings of the current study revealed a lack of awareness of risks associated with common travel-related infectious diseases among travelers.

The protection of travelers against vaccine-preventable, travel-related diseases is of crucial importance. The most common vaccines are against typhoid fever, acute viral hepatitis, influenza, varicella, measles, pertussis, and bacterial meningitis.²¹ A study by Toovey et al²² found that 48% and 44% of individuals considered themselves at risk for hepatitis A and hepatitis B, respectively, considering their destinations. Similarly, a study by Flaherty et al²³ found that travelers had a low level of awareness of travel-related infectious diseases. They determined that the highest perceived risk was for dengue virus infection. In the current study, it was found that risk awareness for malaria, typhoid, and yellow fever was higher among travelers to Africa (Figure 1). While various factors may affect travelers' perceptions, a possible explanation for the higher awareness of these concerns might be that the services provided by the travel health center cover primarily these diseases. When asked for their opinions about the uptake of travel vaccines, 60.5% of the respondents said that vaccines provided basic protection, 35.7% said that they were safe, 3% said that they had side effects, 0.6% said that they were not necessary, and 0.2% said that they were ineffective. These findings are close to those of Toovey et al,²² who reported that 92% of travelers thought that vaccines

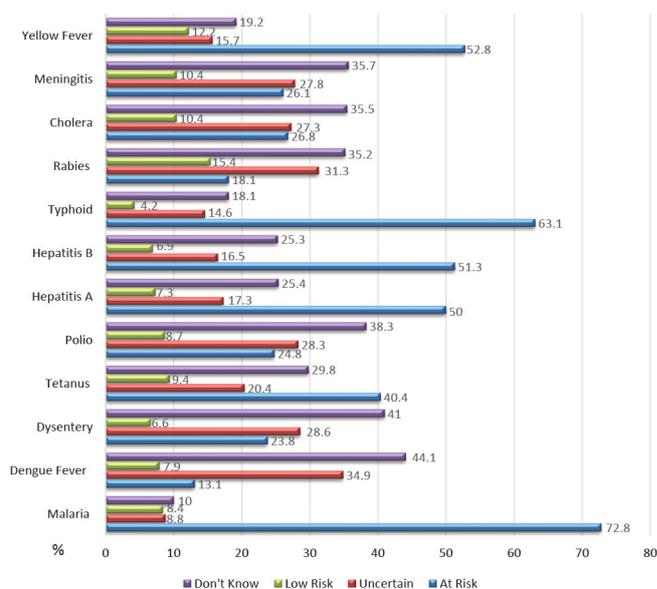


Figure 1. Perceived Risk of Travel-Related Diseases Among the Surveyed Travelers.

provided essential protection, 39% thought that they were safe, 22% thought that they had side effects, and 6% thought that they were unnecessary.²²

Conclusion

It is possible to ensure better travel preparation and a healthier trip by informing travelers about likely travel health risks, things to do, and vaccinations prior to their travel. Health professionals, insurance companies, travel agents, and travel health centers should take more responsibility for this issue. Advanced research is needed to identify the best strategies for initiating behavioral changes in individuals with regard to travel health. Automatic warning messages can be presented to travelers during ticketing, directing them to travel health centers, which can ensure that travelers visit travel health centers and raise their awareness.

Study Limitations

The data obtained during the four-month period of the current study may differ from that of other months of the year. It can therefore be suggested that studies be undertaken in different periods of the year to be able to make a comparison. A study may be performed with a larger sample group or in different countries. Despite these limitations, this study offers valuable insights into the behavior and knowledge of travel health, travel-related diseases, and vaccines among international travelers who visit travel health centers.

Authors' Contributions

BK conceived the paper. BK and MS interviewed participants. BK led the data analysis with support from coauthors. All authors contributed to data interpretation and writing the manuscript and approved the submitted version of the manuscript.

Conflicts of Interest Disclosures

The authors declare they have no potential conflicts of interest

Research Highlights

What Is Already Known?

- Little is known about the health status and knowledge of travel health, travel-related diseases, and vaccines among individuals who will travel abroad and visit travel health centers.

What This Study Adds?

- International travelers have inadequate healthcare knowledge and practices.
- It can be possible to ensure better preparation for traveling and a healthier trip by informing individuals about likely travel health risks, things to do, and vaccinations prior to their travels.
- Health professionals, insurance companies, travel agents, and travel health centers should take more responsibility for the issue of travel health awareness among travelers.
- Advanced research is needed to identify the best strategies for initiating behavioral changes in individuals with regard to travel health.

with respect to the research, authorship, and/or publication of this article.

Ethical Approval

Permissions and ethical approval were obtained to conduct the study. Prior to data collection, the participants received an explanation of the research, and their oral and written informed consent was obtained. Respondents were not offered incentives and were informed that participation in the study was voluntary. This study obtained ethical approval from the Hacettepe University Ethics Commission with Code: 43551.

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