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Short Communication

Addressing travelers' perception of risk in pre-travel care: Reports from a travel clinic in Rio de Janeiro, Brazil

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Abstract

Introduction: Travel medicine is aimed at promoting health risk reduction. However, travelers' perception of risk is subjective and may influence implementation of recommendations. This study reports on travelers' perception of risk, pre-travel characteristics, and recommended interventions. **Methods:** This is a descriptive cross-sectional study. **Results:** This study included 111 individuals. Most travelers (74%) perceived their risk as low. Significant differences in travel-related risk perception between practitioners and travelers were observed (Gwet's agreement coefficient [AC1] 0.23; standard error 0.10; 95% confidence interval 0.02–0.44). **Conclusions:** Future studies should investigate the relationship between travelers' perception of risk and implementation of recommendations.

Keywords: Pre-travel care. Travel medicine. Travelers' perception of risk. Practitioners' perception of risk.

Pre-travel care aims to promote risk reduction by educating travelers about anticipated health risks and recommending appropriate immunizations[1,2]. In this clinical setting, evaluating and understanding traveler's perception of risk may enable travel medicine practitioners to manage travel-related risks more efficiently. In this study, we describe pre-travel characteristics, recommended interventions, and risk perception of practitioners and travelers seeking care at a hospital-based travel clinic in Rio de Janeiro, Brazil.

This is a descriptive cross-sectional study. Non-identifiable data, corresponding to the time period between June 1, 2017 and March 31, 2018, collected from the travel clinic affiliated with *Instituto Nacional de Infectologia Evandro Chagas* (INI), Rio de Janeiro, Brazil, were stored in an electronic database. The health care services provided by INI are funded by the Brazilian public health system (known as Sistema Único de Saúde, SUS).

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International travel was defined as a stay of at least one night at a destination outside Brazil. National travel was defined as a stay of at least one night at a state other than Rio de Jeneiro. Data about individuals who consulted the practitioner in a group or with family were recorded separately. The risk perception of practitioners and travelers was classified as low risk, moderate risk, and high risk. Data collected included patient demographics (age, sex, and comorbidities), baseline characteristics (travel destination, planned travel duration), vaccines recommended, anti-malarial chemoprophylaxis, and the travel advice provided. Pre-travel data were collected by medical staff using Research Electronic Data Capture (REDCap), a secure web platform for the construction and management of online surveys and databases[3]. Continuous variables were presented as median and interquartile range (IQR). Gwet's agreement coefficient and its variance were used to evaluate the differences in risk perception between practitioners and travelers (inter-rater reliability)[4]. We used R (version 3.0.3), library "rel" to analyze the data. This study was approved by INI's ethics committee (CAAE 29601114.7.0000.5262) and was conducted according to the principles in the Declaration of Helsinki. All patient records/ information were de-identified prior to analysis.

Overall, 111 individuals were included in the study. Most individuals were female (56.8%), with a median age of 40 years (IQR 31−53). Most individuals (89.2%) were educated for at least 8 years. Of the total individuals, 87.8% consumed alcohol and 17.1% had a smoking habit (ever use). Almost half of the individuals reported at least one comorbidity (48.6%). Arterial hypertension and diabetes mellitus were the most frequently observed comorbidities (50.7% and 20.4%, respectively).

Most individuals (64.2%) reported tourism as the main purpose of travel. Work-related, visiting friends and relatives (VFRs), and missionary/religious purposes were reported by 18.9%, 3.8%, and 1.9% of travelers, respectively. International destinations were more frequently reported than national destinations (82.9% and 20.7%, respectively). The median time period between the consultation and the departure dates was 31 days (IQR 16.0 - 61.0). The minimum and maximum time periods between the consultation and the departure were 1 and 258 days, respectively. The median duration of stay was 14 days (IQR 18.0 - 32.0). The minimum and maximum durations of stay were 5 and 371 days, respectively.

There has been a change in the flight dynamics in Brazil. Currently, South America has the largest number of international flights to and from Brazil (7.4 million), followed by Europe and North America (5.9 million and 4.9 million, respectively)[5]. Correspondingly, we observed that the majority of travelers seeking care at INI's travel clinic were women, headed to South America for tourism. This could be of international public health interest because Brazil has a robust flight traffic, with a total of 109.6 million passengers transported in 2016, with 88.7 million domestic flights and 20.9 million international flights[5]. The city of Rio de Janeiro alone is responsible for more than 11% of all domestic flights[5].

Malaria chemoprophylaxis was recommended for 25.2% of the travelers. At least one serology test was ordered for 75% of the travelers. At least one vaccine was prescribed for nearly all travelers (99.1%). The most frequently prescribed vaccines were for typhoid fever (72.2%), tetanus-diphtheria (69.4%), rabies (41.4%), and yellow fever (40.5%). The complete list of prescribed vaccines is provided in **Table 1**.

TABLE 1: Socio-demographics, travel characteristics, and recommended interventions of travelers seeking care at a hospital-based travel clinic in Rio de Janeiro, Brazil (*N* = 111).

Variables	n	%
Socio-demographics		
Median age, years (IQR)	40	31 – 53
Sex (female)	63	56.8
Education ≥ 8 years	99	89.2
Any comorbidities	54	48.6
High blood pressure	27	50
Diabetes mellitus	11	20.4
Dyslipidemia	8	14.8
Substance abuse[a]	41	36.9
Alcohol	36	87.8
Tobacco	7	17.1
Psychiatric condition[b]	12	10.8
Travel characteristics		
Median duration of stay, days (IQR)	14	18 – 32
Median Δt consultation-departure, days (IQR)[c]	31	16 – 61
Travel insured	84	78.5
Number of destinations (countries)		
1 destination	70	63.1
2 destinations	20	18
3 destinations	9	8.1
4 destinations	2	1.8
5 destinations or more	10	9
Destinations, Brazil	23	20.7
North	17	73.9

Continue....

TABLE 1: Continuation.

Northeast	0	0
South	1	4.3
Southeast	1	4.3
Midwest	5	21.7
Destinations, international	92	82.9
Africa	25	27.2
Asia	25	27.2
Oceania	15	4.3
Europe	4	16.3
North America	16	17.4
Central America	14	15.2
South America (except Brazil)	22	23.9
Advice given, and interventions recommended		
Malaria chemoprophylaxis		
No	83	74.8
Yes	28	25.2
Antimalarial drug		
Doxycycline	25	89.3
Mefloquine	---	---
Atovaquone-proguanil	3	10.7
At least one prescribed vaccine	110	99.1
Frequency of prescribed vaccines		
Typhoid fever	80	72.1
Tetanus-diphtheria	77	69.4
Rabies	46	41.4
Yellow fever	45	40.5
Hepatitis A	35	31.5
Hepatitis B	38	34.2
Meningococcal ACYW135	25	22.5
Influenza	31	27.9
Inactivated polio vaccine	37	33.3
Measles, mumps, rubella	30	27.0
Pneumococcal 13-Valent	13	11.7
Meningococcal B	14	12.6
Meningococcal C	2	1.8
Cholera	1	0.9
Oral polio vaccine	2	1.8
Varicella	2	1.8
Tetanus, diphtheria, acellular pertussis	1	0.9
Pneumococcal 13-Valent	1	0.9
Other vaccines	3	2.7
Japanese encephalitis	2	66.7
Human papilloma virus	1	33.3

[a]Ever use; [b]Use of at least one psychotropic medication; [c]Median time (days) between the date of medical consultation and the date of departure; **IQR:** interquartile range.

In fact, travel-related risk perception varied significantly between the practitioner and the traveler (Gwet´s agreement coefficient [AC1] 0.23; standard error 0.10; 95% confidence interval 0.02–0.44) (**Figure 1A**). Travelers' risk perception was more frequently classified as low risk (74%). While 31% of the trips were included in the high-risk category by the attending physician, this category was attributed only by two travelers (4%) (**Figure 1B**).

Evaluating travelers' perception of risk is paramount during a pre-travel consultation. Although travel medicine practitioners may objectively recognize the hazards associated with a specific risk, ultimately, the travelers' perception of risk is subjective. Moreover, this subjective perception can influence implementation of recommendations. For instance, a low risk perception has been described as a reason for declining interventions[6]. In this study, we demonstrate that most travelers had a low-risk perception, and that there was a significant difference in travel-related risk perceptions between practitioners and travelers, as assessed by Gwet's agreement coefficient. Our results could help travel medicine practitioners to tailor intervention measures such as malaria chemoprophylaxis. Malaria is one of the most common causes of fever in a returning traveler[7]. Choosing a chemoprophylaxis regimen requires the consideration of several factors such as the revision of travel itinerary, cost of medicines, and potential side effects[8]. In Brazil, doxycycline is the sole treatment agent widely available (i.e. it does not necessitate import). However, doxycycline regimen is associated with photosensitivity, gastrointestinal side effects, increased frequency of vaginal yeast infections, and need to be kept for 28 consecutive days after leaving the affected area.[9,10]. Hence, it is unlikely that compliance to this regimen would be optimal. A reasonable alternative would be atovaquone–proguanil, a regimen that can be discontinued 7 days after exposure, and is preferable for short-term travel (<3 weeks)[11–13], as is the case in our cohort, where the median duration of stay was 14 days (IQR 18 – 32).

In conclusion, our results highlight the importance of assessing travelers' perception of risk during a pre-travel consultation. Our results suggest that future studies should focus on the role of travelers' perception of risk on implementation of recommendations. Our study has limitations that should be acknowledged. Its observational design limited our ability to control for unknown sources of confounding and bias, and its small sample size and single-center design limit the generalization of our findings.

A

Inter-rater agreement (n=54)

	Estimate	SE	Lower CB	Upper CB
ACI	0.23	0.10	0.02	0.44

B

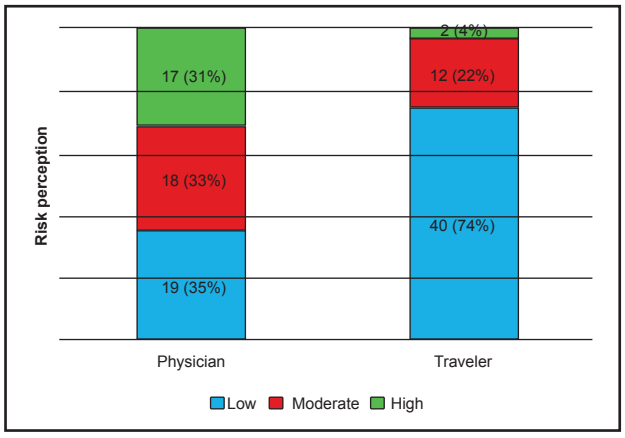

FIGURE 1: Inter-rater agreement and travel-related risk perception of physicians and travelers seeking care at a hospital-based travel clinic in Rio de Janeiro, Brazil. (A) Gwet´s agreement coefficient, AC1; standard error, SE; lower and upper (5-95%) confidence bounds, CB (B) Travel-related risk perception.

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Conflict of Interest

The authors declare that there is no conflict of interest. This study had no funding source.

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