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Travel Health in the Kingdom of Saudi Arabia: Perception and Practice of Saudi Travelers

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Abstract

Background: Because of rapid air travel, international travelers are exposed to diversity of health risks of the unfamiliar environment of the visited area; epidemics and pandemics which are related to travel can be minimized by suitable precautions taken before, during and after travel. Large numbers of Saudis travel each year for various purposes. Yet, there is only limited data concerning the extent to which Saudi travelers seek travel advice and vaccination before their departures.

Aim and Objectives: Therefore, the aim of this study was to determine the levels of travel health knowledge, attitudes and practices (KAP) among Saudi travelers at international airports of KSA and to identify where these travelers obtain travel health information.

Methods: This cross-sectional descriptive study was carried out at two of the four international airports in the Kingdom of Saudi Arabia (KSA), namely King Abdul-Aziz international airport (KAA) in Jeddah and King Fahad International airport (KFA) in Dammam. Any adult Saudi international traveler departing from the two selected international airports was eligible for inclusion in the sample. Randomly selected individuals (n=800) were invited to fill an anonymous self-administered questionnaire that was designed to assess traveler's knowledge and attitude about travel health in addition to pre-travel practices. Data entry and statistical analyses were done using SPSS 20.0 statistical software package. In addition to descriptive statistics, multiple stepwise backward regression analysis was used after testing for normal distribution, linearity and

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homoscedasticity, and analysis of variance for the full regression models. Statistical significance was considered at p-value <0.05.
Result: The majority of respondents were males (78.8%) with mean age of 33±10.1 years and mostly with intermediate or higher education (98.1%). The most frequently reported purpose was tourism (69.9%), which were mainly to Arab countries (60.9%) followed by Asia (31.7%). The lowest levels of knowledge were related to transmission of viral hepatitis B and yellow fever, while the highest were related to transmission of influenza, diarrhea, and gonorrhea. They had highly positive attitude regarding importance of personal hygiene (84.1%), while others were not as high, e.g. the importance of visiting doctor before travel (50%), and 52.7% upon importance of vaccination (52.7%). Only 19.9% of the participants consulted a doctor for their travel, 23.7% looked for health-related information, and only 11.2% got such information, and 3.3% got vaccination. From the regression model, it was evident that increasing age, increasing level of education, not traveling alone, and being in the Eastern region were associated with higher knowledge scores.
Conclusion: Adult Saudi travelers have major deficiencies in knowledge regarding travel-related disease transmission and prevention, their attitudes are better, but their pre-travel practices are inadequate. Knowledge, attitude, and practice are inter-correlated and are influenced by age, education, and certain travel characteristics.

Keywords: Travel health, knowledge, attitude, practice**,** Saudi Arabia.

1 Introduction

Increasing numbers of people traveling internationally for various purposes, exposes them to a variety of health risks of the unfamiliar environment of the area visited, and also can introduce any infectious agents they may harbor to the visited area. Because of rapid air travel, no country is safe from infectious diseases and an outbreak in one country can easily and rapidly be transmitted across long distances. Epidemics and even pandemics as avian flu, malaria, measles, and swine flu have panicked the world, and many are related to travel, which led the WHO to regularly issue related travel alerts (1). Most of such risks can be minimized by suitable precautions taken before, during and after travel (2). It is possible that travel-associated disease rates may be modified by maximizing access to care and augmenting educational methods of disease prevention (3). Moreover, since travelers are often unaware of the risk factors for acquiring the disease during the travel, making them aware of important behavior modifications and vaccination is essential (4). The main focus of travel medicine was on traveler's diarrhea, malaria, and general vaccinations. Recently, this specialty is now a multidisciplinary one that encompasses infectious and tropical diseases, public health and preventive medicine, as well as lab and immunization (5,6). Travel medicine standards are typically based on evidenced recommendations that had been graded using the Infectious Diseases Society of America, United States Public Health Service grading system (7). Pre- as well as post-travel consultations are the responsibility of travel medicine practitioners although it is recommended to make this service available in primary care settings (8). Just asking patients about their recent travel history could be a major clue in determining the cause of their illness (9). Travel advices can be reinforced with brochures or similar printed material (10), and efforts in fostering travel medicine activities were shown to lead to

improvement in the trends of protection against communicable diseases such as hepatitis A among Dutch travelers (11). Saudi Arabia has a total of 202 airports with four major international ones. A system of 24 regional airports connects the remote regions of the country to the international airports and consequently to the rest of the world. King Abdul Aziz International Airport serves Jeddah and currently handles about 13 million passengers annually, with plans for expansion. Currently, Saudi Arabian Airlines is the major operator for the region transporting more than 10 million passengers annually (12).
Large numbers of Saudi residents travel each year to countries where malaria, hepatitis A, hepatitis B and other vaccine-preventable diseases are prevalent. Yet, there is only limited data concerning the extent to which Saudi travelers seek travel advice and vaccination before their departures. Relatively little is known about how Saudi travelers perceive risks associated with travel or how they prepare for their international voyages; moreover, there are no consensus guidelines on travel-related health issues in Saudi Arabia. The aim of this study was to determine the levels of travel health knowledge, attitudes and practices (KAP) among Saudi travelers at international airports of KSA and to identify where these travelers obtain travel health information.
Subjects and methods : This cross-sectional descriptive study was carried out at two of the four international airports in KSA, namely King Abdul Aziz international airport (KAA) in Jeddah and Dammam international airport. Both airports have the largest numbers of international travelers in the Kingdom. Any adult Saudi international traveler departing from the two selected international airports was eligible for inclusion in the sample. The sample size (n=800) was estimated to determine the prevalence of satisfactory knowledge, attitude, or practice of 31%(13) or more, with a 5% absolute error and a 95% level of confidence with a design effect 1.5 and a non-response rate of about 25%. An anonymous self-administered questionnaire was used; it included, in addition to demographic characteristics and past and current travels, items reflecting their knowledge, attitude and questions about pre-travel practices and intended practices during travel. All official permissions to carry out the study were secured from pertinent authorities in addition to informed verbal consent was obtained from all the participants before collecting any data. Data entry and statistical analyses were done using SPSS 20.0 statistical software package. Data were presented using descriptive statistics and in order to assess the relationship between scores of knowledge, attitude, and practice as dependent factors, on the one hand, and various independent factors, on the other hand, multiple stepwise backward regression analysis was used after testing for normal distribution, linearity and homoscedasticity, and analysis of variance for the full regression models. Statistical significance was considered at p-value <0.05.

2 Main Result

The age of the respondents (n=788) ranged between 18 and 70 years, with mean±SD 33±10.1 years who were mainly males (78.8%), with intermediate or higher education (98.1%). Slightly more than half of them were married (53.0%). The most common jobs were the managerial (30.7%) and clerical (21.3%); only about 16% had chronic diseases and regular medications (16.5%) [Table1]. On average, the travellers indicated that they are travelling twice annually, most often for tourism (69.9%) to mainly Arab countries (60.9%) and Asia (31.7%) for an average of eight and 28 days [Table2; Figure1]. The lowest percentages of correct knowledge were related to viral hepatitis B and yellow

fever. On the other hand, knowledge was highest for transmission of influenza, diarrhea, and gonorrhea, and prevention of meningitis, hepatitis A, influenza, and cholera [Table 3]. High positive attitudes were showed among participants regarding the importance of personal hygiene (84.1%), while others were not as high, e.g. only 50.0% agreed upon the importance of visiting doctor before travel, and 52.7% upon importance of vaccination. Only 19.8% agreed upon the use of condom for protection. On the other hand, 64.7% had the opinion that infectious diseases were not related to traveling [Table 4]. Regarding pre-travel practices [Table 5], most of the participants spent 15 days or more in preparing for the trip (75.1%). However, only 19.9% of them consulted a doctor for their travel, 23.7% looked for health-related information, and only 11.2% got such information, and 3.3% got vaccination. Concerning behaviors during travel, participants claimed high concern of hygienic behaviors; yet, they shoed lower concern about collecting information about remote areas to be visited (50.8%), and asking about nearest health center (36.7%,). Also, only less than one third reported avoiding suspicious food as green salad, ice cream, or ice cubes. To summarize the total knowledge, attitude, and practice of participants regarding travel health, Table 6 points to very low scores of knowledge, with three-fourth of the sample having a score of 46.2 out of a maximum of 100. Meanwhile, more than half of them had an attitude score of 65.5 out of 100. The practice scores were slightly better than the knowledge but less than the attitude.

The best fitting multiple linear regression model [Table7] for knowledge score indicates that age, education, companions, and setting were the statistically significant independent predictors of the knowledge score. It is evident that increasing age, increasing level of education, not traveling alone, and being in the Eastern region were associated with higher knowledge scores. Similarly, attitude score was significantly predicted by age, education, companions, setting and chronic diseases. Increasing age, increasing level of education, traveling alone, being in the Eastern region, and having a chronic disease were associated with higher attitude score. Also higher knowledge scores predicted higher attitude scores. Meanwhile, age, education, companions, marital status, chronic diseases, number of countries; and knowledge and attitude scores, predicted the practice score. Increasing age, increasing level of education, traveling alone, being married, having a chronic disease, and increasing number of countries to be visited were associated with higher practice score. Also higher knowledge and attitude scores predicted higher practice scores.

Table 1: Socio-demographic characteristics and medical history of participants in the study sample (n=788)

	Frequency	Percent
Age (years):		
Range	18-70	
Mean±SD	33±10.1	
Sex:		
Male	621	78.8
Female	167	21.2
Education:		
Illiterate	3	0.4
Read/write	1	0.1
Preparatory	11	1.4
Intermediate/Secondary	305	38.7
University	468	59.4
Marital status:		
Married	418	53.0
Single	346	43.9
Divorced	24	3.0
Job:		
Professional	101	12.8
Managerial (administrative jobs)	242	30.7
Clerical (employees)	168	21.3
Manual worker	30	3.8
Trade	45	5.7
Student	112	14.2
Unemployed/retired	42	5.3
Housewife	48	6.1
Medical history:		
History of chronic diseases:	128	16.2
Intake of regular medications:	130	16.5

Table 2: Travel history of participants in the study sample (n=788)

	Frequency	Percent
History of previous travels:		
Average number per year:		
0-1	222	28.2
2-4	385	48.9
5+	181	23.0
Range	0-36	
Median (interquartile)	2 (1-4)	
Current travel:		
Number of countries to be visited:@		
1	739	93.8
2	39	4.9
3+	10	1.3
Destinations:@		
Arab countries	481	61.0
Asia	250	31.7
Europe	102	12.9
USA/Canada	15	1.9
Duration of travel (days):		
1-7	149	18.9
8-14	264	33.5
15-28	239	30.3
29+	136	17.3
Companions:		
None	279	35.4
Family	300	38.1
Friends/colleagues	209	26.5

(@) Not mutually exclusive

Table 3: Total knowledge about some common communicable diseases and travel health risk among travelers in the study sample (n=788)

	Correct knowledge about			
	Transmission		Preventive measures	
	No.	%	No.	%
Viral hepatitis A	471	59.8	661	83.9
Viral hepatitis B	69	8.8	59	7.5
Cholera	464	58.9	582	73.9
AIDS	267	33.9	168	21.3
Meningitis	497	63.1	680	86.3
Influenza	671	85.2	598	75.9
Malaria	315	40.0	221	28.0
Diarrhea	662	84.0	425	53.9
Gonorrhea	608	77.2	568	72.1
Typhoid	352	44.7	46	5.8
Yellow fever	58	7.4	451	57.2

Table 4: Attitudes towards travel health as reported by travelers in the study sample (n=788)

	Disagree		Uncertain		Agree	
	No.	%	No.	%	No.	%
I think that travel does not increase risk if I am in good health	404	51.3	85	10.8	299	37.9
I believe that infectious sexual diseases are transmitted only by illegal sex	430	54.6	71	9.0	287	36.4
In my opinion visiting doctor before travel is essential	154	19.5	240	30.5	394	50.0
I think that vaccines are very important before travel	149	18.9	224	28.4	415	52.7
If I travel frequently, I do not need preventive measures much	369	46.8	175	22.2	244	31.0
I think that malaria chemoprophylaxis is not effective	286	36.3	206	26.1	296	37.6
In my opinion, personal hygiene protects from many diseases	54	6.9	71	9.0	66.3	84.1
The use of condom is not preferred even if protective	457	58.0	175	22.2	156	19.8
I do not think that infectious diseases could br related to traveling	174	22.1	104	13.2	510	64.7
I think that gastro-enteritis only affects children and elderly	528	67.0	90	11.4	170	21.6

Table 5: Health seeking behavior regarding vaccination for current travel as reported by travelers in the study sample (n=788)

	Frequency	Percent
Before travel:		
Time taken in preparation for travel (days):		
1-7	82	10.4
8-14	114	14.5
15-28	193	24.5
29-60	265	33.6
>60	134	17.0
Consulted doctor for travel	157	19.9
Bought health insurance in destination country	157	19.9
Looked for health-related information for travel	187	23.7
Acquired information about potential travel hazards	88	11.2
Got vaccinations	26	3.3
During travel:		
Comply with personal hygiene	770	97.7
Ensure lodgment is sanitary and hygienic	709	90.0
Avoid illegal sex	725	92.0
Take prophylactic medications (e.g. malaria) as ordered by doctor	641	81.3
Use protective measures against insects	643	81.6
Collect information about remote areas to be visited	400	50.8
Ask about nearest health center	289	36.7
Avoid:		
Suspicious food/drinks	585	74.2
Unbottled drinking water	596	75.6
Suspicious ice cream	256	32.5
Suspicious green salad	245	31.1
Uncooked food (oysters, fish, etc.)	626	79.4
Ice cubes	193	24.5

(@) Not mutually exclusive

Table 6: Total knowledge, attitude, and practice scores related to travel health among travelers in the study sample (n=788)

	Score (%)		
	Knowledge	Attitude	Practice
Mean	37.7	66.4	45.0
Standard deviation	13.2	12.1	17.9
Median	38.6	65.5	42.3
First-third quartiles	28.9-46.2	58.2-75.0	32.0-56.9

Table 7: Best fitting multiple linear regression model for travelers' scores of knowledge, attitude, and practice

	Unstandardized Coefficients		Standardized Coefficients	t-test	p-value
	B	Std. Error			
Knowledge score					
Constant	24.112	5.108		4.720	<0.001*
Age	.151	.052	.116	2.939	0.003*
Education (reference: illiterate)	3.656	.776	.159	4.712	<0.001*
Companions (reference: alone)	2.407	.573	.143	4.201	<0.001*
Setting (reference: Eastern region)	-6.712	.893	-.255	-7.517	<0.001*
r-square=0.14, Model ANOVA: F=26.41, p<0.001					
Variables entered and excluded: sex, marital status, smoking, chronic disease, No. of countries to be visited					
Attitude score					
Constant	49.748	4.785		10.397	<0.001*
Age	.107	.050	.089	2.148	0.032*
Education (reference: illiterate)	4.052	.728	.191	5.568	<0.001*
Companions (reference: alone)	-2.177	.535	-.141	-4.070	<0.001*
Setting (reference: Eastern region)	-3.242	.853	-.134	-3.799	<0.001*
Chronic disease	-3.549	1.163	-.108	-3.051	0.002*
Knowledge score	.171	.033	.186	5.172	<0.001*
r-square=0.13, Model ANOVA: F=18.34, p<0.001					
Variables entered and excluded: sex, smoking, marital status, number of countries to be visited					
Practice score					
Constant	-5.842	5.813		-1.005	.315
Age	.195	.068	.110	2.860	0.004*
Education (reference: illiterate)	4.202	1.365	.096	3.079	0.002*
Companions (reference: alone)	-2.833	.731	-.124	-3.877	<0.001*
Marital status (reference: married)	-2.616	1.172	-.081	-2.233	0.026*
Chronic disease	-3.633	1.613	-.075	-2.252	0.025*
Number of countries to be visited	5.818	1.802	.100	3.229	0.001*
Knowledge score	.248	.045	.182	5.543	<0.001*
Attitude score	.507	.048	.342	10.562	<0.001*
r-square=0.25, Model ANOVA: F=34.52, p<0.001					
Variables entered and excluded: education, smoking, setting					

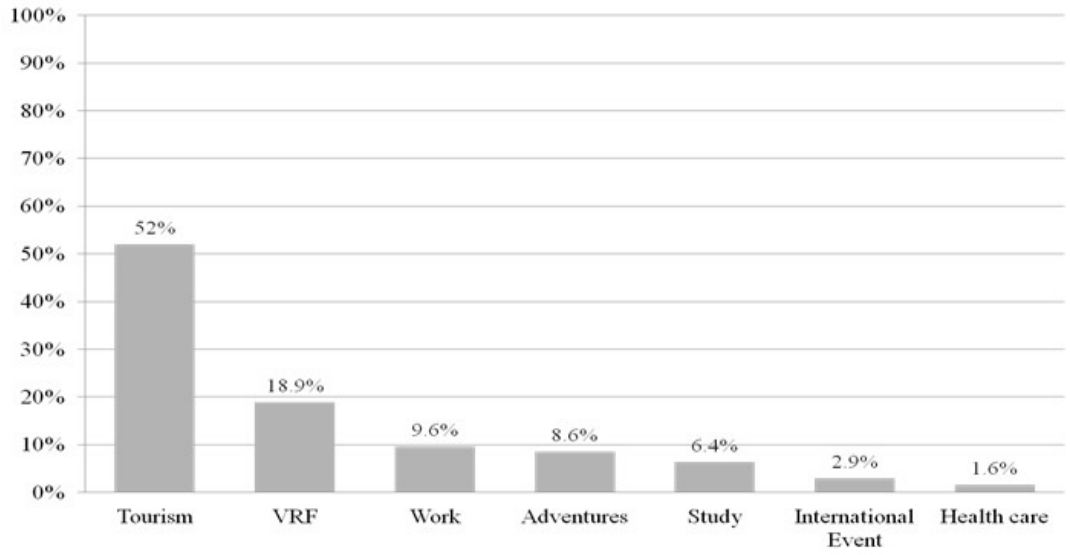

Figure 1: Purposes of travelling as stated by the respondents.

3 Discussion

As the majority of the study sample consisted of males in the second and third decades of their life who are more likely to be exposed to situations with relatively high risk-taking behaviors, in addition to other travellers who were suffering from chronic diseases and on regular medications, it was expected that they would get special attention in pre-travel counseling (14). Nevertheless, an alarming finding of the present study was the major deficiency in passengers' knowledge about common travel-related infectious diseases modes of transmission and preventive measures. Also, high percentages of incorrect knowledge and misconceptions about transmission of diseases, especially regarding transmission of HAV by sex and blood, and meningitis, malaria, and yellow fever by food. On the other hand, knowledge about the preventive measures for diarrhea was high. This deficient knowledge does not coincide with the mostly high level of education among the respondents. This might be related to lack of health awareness. Moreover, the very low knowledge about yellow fever could be attributed to that none of the passengers reported a destination to sub-Saharan Africa. However, similar findings were reported among US commercial flight attendants (15), Japanese travelers (16), Canadian passengers (17) and even among highly educated faculty members in Latin America (18). On the other hand, Swiss travelers were found to have high knowledge about malaria, where almost all business travelers, 95%, correctly knew about its mode of transmission (19). Similar findings were reported among Swedish travelers (20). This high levels of knowledge revealed in these two studies might be attributed to high level of health awareness in Switzerland and Scandinavia, in addition to the fact that the former study was limited to business travelers. The low level of knowledge about barrier measures for protection against AIDS among passengers in the present study could be related to cultures and values. In fact, the great majority of them reported chastity as the main measure of protection against AIDS. This is also reflected on their attitude of refusal of use of condom even if it is protective. On the other hand, the high levels of knowledge

about the vaccines for HAV, cholera, and meningitis could be attributed to common use of these vaccines in the pilgrimage period every year. Risk perception is a very important safeguard for self-protection against many diseases associated with travel (21). The present study has shown that about half of the participants were denying or had uncertain attitudes regarding perception of risk of diseases related to travel. This finding implies a higher susceptibility of exposure to travel risks. It is in agreement with the study done in Qatar, which reported that approximately 60% of Qatari travelers did not perceive risk of diseases related to their travels (22). Also in congruence with this, studies reported low levels of risk perception among travelers in United States (23), Australia (13) and Korea (24). The duration of time taken for preparation of travel is important and may reflect the caring of the traveler for his/her health. In the present study, about half of the participants reported having been preparing for their trips for one month or more. The optimal period required for pre-travel consultation was mentioned to be four to six weeks (25). Closely similar findings were reported among Spanish travelers, where the mean time preparing the trip was 39 days (26). In the same vein, an airport survey in the United States travelers revealed that more than half of the travelers prepared their trip at least a month in advance (23). Also, 46% of travelers in South Africa were found to have prepared for their trip at least one month before departure (27). On the other hand, only 14.5% of Qatari travelers started preparing for their travel one month or more ahead (22). Concerning actual practices related to vaccination, only a very small minority (3.3%) of the present study participants reported having got vaccination for their current travel, mostly for influenza and meningitis. The findings reflect a low level of health seeking behaviors. However, the need for vaccination depends on the destination and related vaccine-preventable diseases, as well as the vaccination history of the traveler. In congruence with these findings, Hamer and Connor (2004)(23) highlighted that although the majority of American travelers believed that vaccines were effective for prevention, only a minority of them were vaccinated for their travel, e.g. 14% for hepatitis A, and 13% for hepatitis B. Also, a survey of European travelers demonstrated that only 15% of them reported receiving hepatitis B vaccination although 1 in 4 travelers were at increased risk for exposure to hepatitis (28). More recently, a Japanese study reported that among the surveyed US travelers to Asia who were at risk received encephalitis vaccine (29). Nonetheless, high percentages of the present study participants reported positive practices and hygienic behaviors during their travel. These high figures are not commensurate with the low scores knowledge. The discrepancy could be attributed to the fact that these reported practices during travel are just intentions expressed by travelers. In contrast, the pre-travel practices as vaccination and medical consultations are actual facts that either happened or not. Therefore, their reliability is much higher than that of reported intended practices during travel (30). Moreover, the adherence to healthy behaviors wanes during the actual travel due to risk taking behaviors and curiosity, especially among youth. In congruence with this, a survey in Ghana demonstrated that adherence to food and water safety recommendations decreased with time, and the use of malaria chemoprophylaxis declined with increasing duration of travel (31). Similarly, only 32% of Danish travelers were found to have used chemoprophylaxis correctly, 37% used insufficient antimosquito precautions (32). Travelers' knowledge, attitudes, and practices might be affected by their personal characteristics, as well as by the characteristics of their travel. In the present study, the independent predictors of knowledge score were increasing age, increasing level of education, not traveling alone, and being in the Eastern region. The relation with education is quite expected, and also with age. As for not traveling alone, as a positive

predictor of the knowledge score, the explanation could be the feeling of being responsible for the health and safety of companions, which would motivate the traveler to seek more information about health and preventive measures. The higher knowledge score in the Eastern region could be attributed to the nature of the community, which is more overt to travel and tourism. Similar regional differences were reported in Germany (33). In agreement with these findings, Danish sole travelers had lower awareness and healthy behavior, compared to those traveling with companions (32). The present study attitude score predicting factors are similar to those predicting knowledge score, except for traveling alone and the presence of a chronic disease. In fact, traveling alone had a negative impact on knowledge score, whereas it has a positive impact on attitude score. This might be attributed to more apprehension among lone travelers, especially in young age groups, and more concern about the risks and temptations of traveling. This could compel them to express more positive attitudes towards preventive measures and safe behaviors. As for the positive attitude of travelers with chronic diseases, the finding is quite plausible as these patients know the risks imposed on them by their medical conditions, and are willing to abide to healthy behaviors to avoid any additional risks. Regarding the present study participants' practices, the independent predictors were increasing age and level of education, traveling alone, being married, having a chronic disease, and more destinations, in addition to knowledge and attitude scores. In partial agreement with these findings, higher education was an independent predictor of adequate pre-travel practice among Qatari travelers but had an association with traveler's age (22). Meanwhile, traveling alone turned to be an independent factor predicting healthy behaviors among travelers in the present study. This might be explained again by being more anxious about health and risks of travel when being alone. The finding is in agreement with the results of a study carried out in an international Airport in Korea where travel alone was an independent predictor of seeking pre-travel medical advice (24). On the other hand, traveling with companions was found to be an independent predictor of receiving pre-travel health professional health consultation in Peru (34) and among French-speaking tourists (35). Lastly, the presence of chronic diseases among passengers of the present study was an independent predictor of higher scores of attitude and practice related to travel health. The finding is in congruence with Van De Winkel et al. (2007) (36) who emphasized that travelers with risk factors such as those with chronic medical conditions, those on regular medications and the immunosuppressed are increasingly seen among travelers. Their health conditions should not prohibit them from enjoying traveling, although they need special care in pre-travel consultations.

4 Conclusion and Recommendations

Adult Saudi travelers have major deficiencies in knowledge regarding travel-related disease transmission and prevention, their attitudes are better, but their pre-travel practices are inadequate. The scores of knowledge, attitude, and practice are inter-correlated and are influenced by their age, education, and certain travel characteristics. Nonetheless, the study findings should be interpreted with the limitation that the practices were self-reported, which may be associated with some bias leading to over-reporting healthy practices and under-reporting risky ones. The study proposes making available illustrative and simple health education materials at airports and travel agencies and on websites. Special instruction pamphlets should be provided to chronic diseases patients by their

family physicians. The concept of buying health insurance in destination country needs to be boosted and the role of travel agencies needs to be fostered. Lastly, travel medicine should be included in the training of medical students as well as in postgraduate training of family and community medicine physicians, with continuing medical education opportunities.

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