SHORT COMMUNICATION

Risk perception about communicable and vector borne diseases among international travellers to Pakistan: A cross sectional study

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Abstract

With the rise in air travel, the risk of diseases travelling from one geographical area to another has also increased. Relatively little is known about how travellers know and perceive the health risks associated with travel and how they adopt preventive measures before and while travelling abroad. The objective of this study is to determine the risk perception about communicable and vector-borne diseases among international travellers arriving from different countries and to find any association between the level of risk perception and independent variables. A cross-sectional study was conducted with 426 participants enrolled through convenient sampling technique. An already validated questionnaire was used to collect information. Chi square test was applied to ascertain any significant association between dependent and independent variables. Out of 426 respondents, only 226 (53%) had a high risk perception, whereas 220 (47%) had a low risk perception. A significant association was noted between the level of risk perception and gender (x^2=20.9, p=0.000), level of education (x^2=42.9, p=0.000), nationality (x^2=7.5, p= 0.006) and region of arrival of the passengers (x^2=26.2, p= 0.000). The results of the study revealed that 220 (47%) of the travellers had a low risk perception that may lead to an increase in the burden on healthcare system in Pakistan as well as exporting any new disease from Pakistan to other parts of the world where it does not already exist.

Keywords: Travel medicine, Health advisory, Traveller's health, Risk perception.

DOI: https://doi.org/10.47391/JPMA.7153

Introduction

With an increasing trend of air travel, one can be exposed to any new communicable or vector-borne disease at the new destination. This is because of travelling in a short span of time from one geographical area to another culturally different region. Travellers living in countries with a cold climate most of the year, have difficulty in coping with extreme hot climates. Their clothing and food are different from those living in hot climates. Most of the travel-related communicable and vector-borne diseases are either vaccine-preventable as Hepatitis B and COVID-19 or can be avoided by taking prophylactic medications and appropriate protective measures. Hepatitis B is a vaccine-preventable disease and vaccination is recommended especially for travellers over one year of age who are proceeding to endemic areas.[1,2] Malaria is a parasitic infection caused by the bite of a mosquito that affects one's liver and red blood cells. Common to tropical and sub-tropical climates. It leads to recurrent attacks of chills and fever. Malaria is the fifth leading cause of death worldwide. Pakistan is considered a moderate malaria-endemic country but still 177 million individuals are at risk. Roughly 60% of Pakistan's population live in malaria-endemic regions.[3]

Protection from Malaria and dengue (also caused by a mosquito) is possible by adopting prophylactic measures and medication. These include the use of mosquito repellents, bed nets, and appropriate clothing.

With increasing number of air travels, it is important to understand the travellers' knowledge, attitudes, practices, and compliance with travel health advisory provided prior to travel. At Islamabad International Airport direct and indirect flights arrive from almost all over the world. These passengers then travel to other areas of Pakistan as Gilgit Baltistan, Azad Jammu and Kashmir and Swat regions where international airports do not exist.[4-6]

The risk of getting infected with any travel-related communicable or vector-borne disease depends on the destination, duration of stay, activities planned, and the traveller's health status as well as their knowledge, attitude, and practices to cope with the new environment.

Assessment of risk perception about communicable diseases in travellers, arriving or departing is very important. If a new disease is brought in the country, it will add to the burden on our already over-occupied health

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Submission complete: 01-09-2022 **Review began:** 22-11-2022

Acceptance: 15-11-2023 **Review end:** 11-10-2023

system and if any disease is carried out, it will end up in travel and trade restrictions for Pakistani citizens that will affect the economy at a larger scale. For example, the restriction of air travel because of COVID-19 affected the aviation industry as well as travellers financially due to extremely high fares and fewer flights. Similarly, the closure of land crossings affected the daily trade between Pakistan and other neighbouring countries causing escalation of prices of commodities.[7]

Application of effective prophylactic travel health measures not only benefits individuals, it also has a huge public health impact in protecting communities.[7]

Relatively little is known about the knowledge and perceptions of travellers on the health risks associated with travel and the required preventive measures to be adopted before and while travelling abroad. As the assessment of risk perception of international travellers about communicable and vector-borne diseases is important for decreasing global burden of diseases, this study was planned to assess the knowledge gaps to help in enhancing the need of travel health services.

Methods and Results

A cross sectional study was conducted at Islamabad International Airport from April to June 2021. The study participants included a convenient sample of adult international passengers (18 years of age or older) arriving at Islamabad from different countries during the study period. Sample size was calculated using Open Epi calculator.[8] The population was taken as the total number of passengers arriving from different countries in a month. The sample size for the study was 384+10% non-response rate=421, at 95% confidence interval and taking anticipated frequency as 50%. Total number of international passengers arriving at Islamabad International Airport is approximately 6,000 per day making it 180,000 for 30 days.

Data was collected round the clock to include as many travellers as possible arriving from different locations. Of the 450 travellers requested to participate in the study, 426 agreed (response rate=94.6%). A self-administered pre-validated questionnaire was administered to measure the risk perception. Risk perception can be explained as subjective evaluation of the risk of a threatening situation based on its features and severity. In tourism it is linked to the evaluation of the risks involved in travel decisions, purchasing and consuming travel products or experiences.[9]

Questions were asked about their socio demographic characteristics, knowledge, attitudes, practices as well as source of information regarding travel health. In this case knowledge is defined as an accurate risk perception, attitude is either intended risk-seeking or risk-avoiding behaviour, whereas practice is defined as measures taken for protection against a certain travel-related disease.[10]

The questionnaire took approximately seven minutes to complete and consisted of 'Yes/No' or Likert scale questions. It was originally prepared in English but was also translated in Urdu to accommodate participant's language preference. Before starting the data collection, the questionnaire was pilot tested to check the clarity of questions and time required for filling it. Scores of knowledge, attitude, and practices were calculated to assess the level of risk perception. To assess the level of knowledge, attitude, and practice of the respondents, a total of 18 questions (including five for knowledge, two for attitude, eight for practices, and three for source of travel health information) were included. The survey questions were adapted and modified from a previously published study carried out at Oman International Airport in 2016 and the variables were conceptualised from the same study.[10]

The knowledge section consisted of five items and each question had a possible response of "Yes/No" and "Don't know". A median cut-off level was set for adequate knowledge. A median cut-off value was decided to categorise data in terms of high and low values. Five questions were asked for assessment of knowledge and assessment was made on the number of positive and negative responses. Greater scores indicated more positive attitudes towards compliance of following travel health advisory. Practice items total score ranged from 0 – 8, with greater scores indicating good practices towards preventive and precautionary measures.

Data was then entered, cleaned, and analysed in SPSS version 23. Frequencies and percentages for categorical variables were calculated. Chi square test was applied to ascertain any significant association between dependent and independent variables.

Ethical approval to perform the study was obtained from Ethical Review Board of Al-Shifa School of Public Health, Al-Shifa Trust Eye Hospital, Rawalpindi. Approval to approach the public was sought from the airport management and Civil Aviation Authority after describing the importance of the study and its public health impact. Informed written consent was taken from all the study participants. Confidentiality of the respondents and collected data was strictly maintained. Respondents were given the right to withdraw from the interview if they found it unsuitable.

Socio-demographic characteristics of the study

participants (426) are shown in Table 1. Male to female ratio was 1:1 and 193 (45%) of the respondents were from 31 to 45 years of age. Regarding the knowledge of respondents about risk of getting different diseases they considered Hepatitis-B and COVID-19 as most dangerous (53%) whereas the risk of contracting malaria was second (43%). Out of 426, 163 (38.3 %) thought these diseases can be asymptomatic, whereas 263 (62%) said they had no idea. When asked about preventive measures, 370 (87%) respondents were aware of preventive measures to keep them safe from these diseases. Detailed explanation about the level of knowledge is explained in Table 2. Out of 426 respondents, only 88 (21%) had a positive attitude whereas 338 (79 %) showed a negative attitude towards following a health advisory.

Attitudes of international travellers towards communicable and vector-borne diseases are explained in Table 3. Out of 426 respondents, 208 (49%) had poor practices to protect themselves from any communicable and vector-borne disease, whereas 218 (51%) showed good practices. Out of total 426 respondents, 206 (48 %) were vaccinated for

Table-1: Socio-demographic characteristics.

Characteristics	n (%)
Gender	
Male	230 (54)
Female	196 (46)
Age (years)	
15 – 30	103 (24)
31 – 45	193 (45)
46 – 60	87 (20)
61 – 75	43 (10)
Education Level	
Undergraduate	219 (51)
Graduate	146 (34)
Postgraduate	61 (14)
Occupation	
Homemakers	84 (20)
Students	89 (21)
Professionals	179 (42)
Retired	25 (6)
Self employed	49 (11.5)
Marital Status	
Married	115 (27)
Un married	294 (69)
Others	17 (4)
Nationality	
Pakistani	299 (70)
Dual	127 (30)
Accompanied By	
None	128 (30)
Husband/ Wife	33 (8)
Children	60 (14)
Family / Relatives	171 (40)
Friends	34 (8)
Arriving from	
Asia	64 (15)
USA/Canada	81 (19)
Europe	143 (34)
Middle East	119 (28)
Australia	19 (4)
How do you rate your current health on a scale of 1 to 10	
Poor Health	2 (1)
Moderately well	107 (25)
Excellent	317 (74)
Past experience of contracting any communicable or vector-borne disease	
Yes	114 (27)
No	312 (73)

Likert Scale for current health status: 1, 2, 3 and 4 poor, 5, 6, 7 and 8 as moderate and 9, 10 Excellent

Table-2: Knowledge of international travellers about most common communicable and vector-borne diseases in Pakistan.

S. Variable No	Yes n (%)	No n (%)
1. **On asking how do they rate the risk of getting any of these disease during their trip to Pakistan?**		
Hepatitis A	95 (22)	331 (78)
Hepatitis B	226 53)	200 (47)
Tuberculosis	66 (16)	360 (84)
Poliomyelitis	79 (19)	347 (81)
Dengue	178 (42)	248 (58)
Malaria	184 (43)	242 (57)
Covid-19	226 (53)	201 (47)
Chikungunya	16 (4)	410 (96)
2. **Do you think these diseases can be asymptomatic?**	163 (38)	263 (62)
3. **Do you know about any preventive measures before travelling or during stay recommended for these diseases?**	370 (87)	56 (13)
4. **On asking about level of severity of these diseases, level of knowledge of respondents was:**	Adequate Knowledge	Inadequate Knowledge
Hepatitis A	155 (36)	271 (64)
Hepatitis B	214 (50)	212 (50)
Tuberculosis	253 (59)	173 (41)
Poliomyelitis	276 (65)	150 (35)
Dengue	307 (72)	119 (28)
Malaria	249 (58)	177 (42)
Covid-19	341 (80)	85 (20)
Chikungunya	84 (20)	342 (80)
5. **On asking the respondents knowledge about common symptoms of the specified diseases the responses were recorded as follow:**		
	Adequate Knowledge	Inadequate Knowledge
Hepatitis A	169 (40)	257 (60)
Hepatitis B	151 (35)	275 (65)
Tuberculosis	318 (75)	108 (25)
Poliomyelitis	149 (35)	277 (65)
Dengue	348 (82)	78 (18)
Malaria	330 (78)	96 (22)
COVID-19	353 (83)	73 (17)
Chikungunya	70 (16)	356 (84)

Question 1: Respondents were asked about the risk of getting any diseases, and scores were calculated according to responses on total respondents as Yes or No. All these diseases are prevalent in Pakistan. If more respondents replied 'yes' it was considered as having adequate knowledge, which showed that respondents had a good understanding about the level of severity of the common diseases they need to be aware during their trip.

COVID-19 before travel. Forty-eight (11%) received oral medications (anti-malarial mostly) before travel, whereas 172 (41%) did not receive any preventive medicine before travel. Detailed explanation about practices of international travellers to protect themselves from any communicable or vector-borne disease is given in Table 4. Scores of knowledge, attitude, and practices were calculated according to scores of responses and are explained in Table 5. Association of knowledge, attitudes and practices with socio-demographic characteristics is given in Table 6. The level of risk perception was calculated by summating scores of knowledge, attitude, and practices of international travellers about communicable and vector-borne diseases; Out of 426 respondents, only 226 (53%) had a high risk perception whereas 200 (47%) had a low risk perception which means half of our travellers are not following sufficient protective measures or any health advisory and so are at risk of contracting any communicable or vector-borne disease. Level of knowledge was cross tabulated with demographic variables and a significant association was observed between the level of knowledge and nationality. The Pakistani nationals with adequate knowledge about communicable and vector-borne diseases prevalent in Pakistan were 244 (57.5%). A strong association was observed between level of knowledge and education level, country of origin, nationality, and occupation.

Table-3: Attitudes of international travellers arriving to Pakistan towards communicable and vector-borne diseases

S. No.	Variable	Low Risk n (%)	Moderate Risk n (%)	High Risk n (%)
1.	**On asking how they will rate the risk of getting any of these disease during stay in Pakistan?**			
	Hepatitis A	395 (93)	21 (5)	10 (2)
	Hepatitis B	399 (94)	19 (4)	8 (2)
	Tuberculosis	404 (95)	18 (4)	4 (1)
	Poliomyelitis	410 (96)	12 (3)	4 (1)
	Dengue	363 (85)	41 (10)	22 (5)
	Malaria	363 (85)	43 (10)	20 (5)
	COVID-19	325 (76)	45 (11)	56 (13)
	Chikungunya	396 (93)	20 (5)	10 (2)
2.	**On asking how you would rate the effectiveness of preventive measures for communicable and vector-borne diseases you are following.**			
			Less Effective	**Effective**
			6 (2)	420 (98)

Table-4: Practices of international travellers to protect them from any communicable and vector-borne diseases during their trip to Pakistan.

S. No	Variable	Yes n (%)	No n (%)
1.	**Did you receive any advice regarding the measures for preventing the risk of getting any disease for your destination?**	274 (64)	152 (36)
2.	**Would you avoid public transport (e.g. trains, buses, etc.?)**	347 (82)	79 (18)
3.	**Do you avoid going out for entertainment, such as restaurants, theatres, cinema, etc.**	217 (51)	209 (49)
4.	**Do you limit shopping to the essentials?**	165 (39)	261 (61)
5.	**Do you limit physical contact with friends and family?**	209 (49)	217 (51)
6.	**Do you stay indoors at all times?**	39 (9)	387 (91)
7.	**Did you received any vaccine or preventive medicines before travel?**	254 (60)	172 (40)
8.	**Which preventive measures are you following during your trip?**		
	Wearing a mask	327 (77)	99 (23)
	Vaccination for hepatitis	82 (19)	344 (81)
	Vaccination for Covid-19	206 (48)	220 (52)
	Hand hygiene and sanitisation	248 (58)	178 (42)
	Avoiding eating out	97 (23)	329 (77)
	Avoid gatherings	192 (45)	234 (55)
	Anti-malarial for prophylaxis before travel	76 (18)	350 (82)
	Use of mosquito repellents	197 (46)	229 (54)

Table-5: Scoring chart knowledge, attitude and practices.

Knowledge	Adequate	Inadequate
	224 (52.5 %)	202 (47.5%)
Attitude	Positive Attitudes	Negative Attitudes
	88 (20.6%)	338 (79.4%)
Practices	Good Practices	Poor Practices
	218 (51 %)	208 (49%)

Discussion

Risk perception about communicable and vector-borne diseases prevalent in Pakistan was calculated among international passengers arriving from different regions of the world, having different levels of education and different occupations.

To ascertain the perceived risk of contracting any communicable or vector-borne diseases the travellers were asked a variety of questions to ascertain their level of knowledge, their attitudes, practices they were following, and preventive measures they were observing to keep them safe from any disease during their trip.

Level of risk perception has a significant association with gender, literacy level, occupation, and region of arrival of the respondents which shows that some regions/ countries are doing well in guiding their citizens about different risks they might encounter while travelling from one geographical region to another entirely different geographical region. There are certain communicable and vector-borne diseases which are prevalent in one region but not in others and if a person contracts that disease during their trip they can export it from one region to another region where it was not previously endemic.

For example, poliomyelitis and tuberculosis have been eradicated from most parts of the world but are still prevalent in Pakistan. Similarly, we have vectors for dengue

Table-6: Association of knowledge, Attitudes, and Practices with socio-demographic characteristics.

Variable	Level of Knowledge		*p*-value	Attitudes		*p*-value	Practices		*p*-value
	Inadequate Knowledge	Adequate Knowledge		Negative Attitude	Positive Attitude		Poor Practices	Good Practices	
Gender									
Male	116	114	0.177	195	35	**0.003**	136	94	**0.000**
Female	86	110		143	53		72	124	
Age (years) **Groups**			0.056			0.029			**0.000**
18 - 30	54	49		85	18		54	49	
31 - 45	86	107		142	51		85	108	
46 – 60	35	52		77	10		58	29	
60 +	27	16		34	9		11	32	
Nationality			**0.002**			**0.000**			**0.000**
Pakistani	127	172		257	42		183	116	
Dual	75	52		81	46		25	102	
Education Level			**0.001**			**0.000**			**0.000**
Undergraduate	107	112		200	19		144	75	
Graduate	79	67		97	49		57	89	
Postgraduate	16	45		41	20		7	54	
Arriving From			**0.000**			**0.000**			**0.000**
Asia	22	42		59	5		43	21	
Australia	3	16		11	8		4	15	
Canada/USA	54	27		46	35		18	63	
Europe	83	60		115	28		62	81	
Middle East	40	79		107	12		81	38	
Occupation			0.021			**0.000**			**0.000**
Business	31	18		49	0		43	6	
Housewife	32	52		79	5		40	44	
Professional	79	100		119	60		63	116	
Retired	16	9		18	7		11	14	
Student	44	45		73	16		51	38	

and yellow fever. So, it is equally important to know if people are following travel advice and taking required vaccination before travel to safeguard both destinations. People's perceptions about certain communicable diseases and associated risks are key factors contributing to increased public participation in disease preventive measures. The aim of the study was to investigate risk perceptions regarding communicable and vector-borne diseases among travellers arriving in Pakistan. The annual number of international travellers has steadily increased over the last decade all around the world so the acquisition of travel-associated infectious and non-infectious diseases is one of the major public health consequences for travellers. Similar studies have been carried out in Middle Eastern countries and Italy, and keeping in view their public health impact it was conducted in Pakistan as well.

Government travel advisories are an important source of guidance for citizens to avoid risks to travellers when visiting international destinations. In essence, they are an expression of a country's duty of care to its citizens when travelling internationally. Alternatively, they are defined as an extra-territorial security measure for international travellers.

Conclusion

It could be concluded that half of the travellers arriving in Islamabad, the capital of Pakistan, have a very low risk perception about communicable and vector-borne diseases that may lead to increased burden on the healthcare system in Pakistan as well as export of any new disease from Pakistan to other parts of the world where it does not already exist. According to this study, almost half of our travellers are not following sufficient protective measures or any health advisory. Our study also shows an inadequate level of traveller knowledge and poor utilisation of travel health services. The study results highlight the need of a proper travel health advisory at the national level, to be adopted by all incoming international travellers. As most of the travellers were not interested in seeking health advice, there is a need to create awareness as well as health promotion.

Disclaimer: None.

Conflict of interest: None.

Funding disclosure: None.

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Author Contribution:
SS: Data collection, writing under supervision.
QT: Supervision.
ABK: Conceived idea and design.