

Evaluation of Travel Medicine Status in Government Primary Health Care Centers in Riyadh Saudi Arabia: A Mixed-methods Study

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Abstract

Introduction and Objective: Travel medicine (TM) is a rapidly developing, very dynamic, and multidisciplinary field that calls for knowledge of numerous illnesses that can occur while traveling. Therefore, this study aimed to evaluate the TM status in Government Primary Health Care (PHC) Centers in Riyadh city Saudi Arabia. **Materials and Methods:** A cross-sectional observational study was conducted in August 2022 in Government PHC Centers in Riyadh city Saudi Arabia using multistage stratified random sampling. A total of 25 Health centers were drawn from the different regions of Riyadh, northern, south, west, east, and middle areas. The data used are primary data, obtained from physicians assigned in TM clinics using quantitative as well as qualitative data collection methods. **Results:** This study involved 30 physicians, 23 of whom are general practitioners and 7 of whom work in TM clinics. Sixteen (53.3%) of the participants were males and Saudis. The mean age was 41 years and the standard deviation was 11 years. About 46.7% of the participants are registrars or senior registrars. TM -related information is most commonly found in review articles and journals (26%), followed by websites and the internet (21%). **Conclusion:** There were missing communication links between TM clinics and PHC providers in the evaluation of TM clinics in PHC, which needed meetings and continuous training. The TM clinic also needed to develop a plan to raise public awareness about its services among doctors and the community.

Key words: Physicians, primary healthcare, Saudi Arabia, travel medicine

INTRODUCTION

All travel-related health and sickness conditions are classified as travel medicine (TM). TM is a rapidly developing, very dynamic, multidisciplinary field that calls for knowledge of numerous illnesses that can occur while traveling. International travel is one of the most important pathways for infectious illness transmission. With 1.5 billion people traveling globally in 2019, international travel is still rapidly increasing.^[1] Saudi Arabia is a historic place and has various social and cultural activities, leading to expanded travel opportunities, and international travel facilitation in general. Every year several millions of visitors arrive to perform their rituals (Hajj and Umrah). It was estimated that Saudi Arabia has a population of 35.84 million, 20 million visitors annually during the Hajj and Umrah periods, and 16 million travelers, this makes travel-related disease an important public health issue.

Preventive care for travelers is the focus of TM, which is an area in the rapid development of medicine. A systematic risk assessment for each traveler is necessary to correctly evaluate passenger and destination-specific hazards and provide advice on the most effective risk management strategies to promote health and avoid poor health outcomes during travel. Healthcare experts are no longer the exception when it comes to advising tourists on how to avoid travel-related illnesses and hazards.^[2] The general observation is that TM is gaining more popularity hence the need to equip more professionals with the necessary knowledge and skills to give travel advice. It is also important to note that most, if not all, practitioners

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are also intrigued by the idea of TM, and most of them are already offering travel advice.

Therefore, they should be supported by providing sources and training on TM. The strengths and weaknesses of TM should be evaluated at the primary care level to improve their quality.

A few studies concern the evaluation of the work environment of the TM clinic. The research survey was done in Saudi Arabia, Riyadh city, and involved health professionals. Notably, some practitioners do not know about common infectious diseases. It was determined that Riyadh lacks primary health-care practitioners' attitudes about TM, awareness of the topic, and the ability to apply it. The study did not include asking about the barriers the physicians face in obtaining knowledge and practicing TM. This should, however, prompt more of them to learn more about infectious diseases to offer viable advice.^[3]

This study was aim to evaluate the current state of TM in primary health care (PHC) centers in Riyadh city. The following issues were investigated: (1) availability of resources in PHC, (2) availability of vaccines, (3) challenges in TM clinic, and (4) demand from general practice staff for training in TM.

MATERIALS AND METHODS

A cross-sectional observational study was conducted to evaluate the TM status in Government PHC Centers in Riyadh city Saudi Arabia. Data collection was held in August 2022 using multistage stratified random sampling. The process involved selecting physicians from PHC centers in Riyadh city in KSA. A total of 25 Health centers were drawn from the different regions of Riyadh, northern, south, west, east, and middle areas. Participants in general physician clinics were selected randomly and all TM providers in Riyadh city were surveyed. Physicians who work in other specialties were not included in the study. Ethical approval for this study was obtained from the research committee at KSMC. The data used are primary data, obtained from 23 physicians and all 7 physicians assigned in TM clinics using quantitative as well as qualitative data collection methods.

The qualitative approach involves collecting data from seven physicians who were assigned to TM clinics, using one-on-one semi-structured interviews. Questions were asked to know the view of TM physicians on the challenges and barriers that come with working in the TM clinic and to explore the experiences of participants.

The interviews were conducted at participants' workplaces and lasted between 20 and 30 min. The qualitative analysis involved selecting the main themes from the physicians in the TM clinic.

Quantitative phase

The same questions were asked to participants from the general practitioner and physicians assigned to TM clinics in a structured questionnaire covering demographic information, travel health-related knowledge, and practice. We assessed TM by the availability of TM clinics, vaccines, and resources at health centers. Respondents were asked if they ever provided advice to travelers and if any training was undertaken regarding TM. Three topics (yellow fever vaccinations, meningococcal vaccines, and malaria chemoprophylaxis) in the questionnaire were designed to test the level of TM knowledge. The questionnaire was prepared to focus on areas that have been used in similar publications. Similar to the previous studies knowledge scores were calculated.^[4-11] The knowledge levels were analyzed by assigning a score for each correct response and the total score was calculated by computing all the variables (Maximum score = 11). The knowledge score was analyzed as a dichotomous variable taking a mean of 5 (knowledge score <5 or ≥5 points) as cutoff.

Statistical analysis

Data collected were entered and analyzed using Statistical Package for the Social Sciences version 23. Proportions and frequencies were used to summarize and compare data. The association between knowledge scores and physicians' characteristics were analyzed using the Fisher exact test where the level of significance was set to be 0.05.

RESULTS

The total number of participants was 30 where 7 of them was assigned to TM clinics while the remaining 23 are general physician. Among the thirty physicians, sixteen (53.3%) were males and Saudi. The mean age was 41 years and the standard deviation is 11 years. The majority of participants (46.7%) are Registrar/senior registrars. It was found that (71.4%) of physicians assigned to TM clinics proved only pre-travel consultations while general practitioner physicians provided (56.5%) of both pre- and post-travel consultations. These characteristics are summarized in Table 1.

Availability of TM clinics and resources in primary care centers

The results showed that TM is available in four clinics. Out of 25 centers (16%) had Access to resources (i.e., internet and staff website) at the working site. malaria prophylaxis, typhoid vaccine, and yellow fever vaccine are available in 4 centers that have a TM clinic. The proportions related to the availability of routine vaccines are shown in Table 2.

The main sources for TM -related information were found to be review articles and journals that make up (26%), followed

Table 1: Sociodemographic characteristics of the study participants (primary health care physicians and physicians assign to travel medicine clinic)

Characteristics (primary care physicians and travel medicine specialists)	Primary care physicians <i>n</i> =23 (%)	Travel medicine doctors <i>n</i> =7 (%)	Total physicians <i>n</i> =30 (%)
Gender			
Male	47.8	71.4	53.3
Female	52.2	28.6	46.7
Nationality			
Saudi	56.5	42.9	53.3
Non-Saudi	43.5	57.1	46.7
Age, mean (SD)	40 (11)	45 (14)	41 (11)
Age in years			
<30	17.4	-	13.3
30–39	43.5	57.1	46.7
40–49	21.7	-	16.7
>50	17.4	42.9	23.3
Designation			
Registrar/senior registrar	47.8	42.9	46.7
resident	43.5	-	33.3
Consultant	8.7	28.6	13.3
Specialist	-	28.6	6.7
Clinical experience			
≤3 years	21.7	-	16.7
4–8 years	30	43	33.3
9–15 years	30	14.3	26.7
16 years or more	17	43	23.3
Practice level (pre and post-travel medicine consultations/month)			
1–10 consultations	91	-	70
11–20 consultations	4	28.6	10
>20 consultations	0	71.4	16.7
No traveler consultation	4	-	3.3
Type of travel medicine consultations			
Pre-travel consultations	30	71.4	40
Post-travel consultations	13	-	10
Both	56.5	28.6	50
Attended travel medicine updates (CME)			
Yes	-	43	10
No	100	57	90

CME: Continuing medical education

by the internet and staff websites which represent (21%) [Figure 1].

Application of TM in Primary Care Centers Physicians provided pre-travel advice mostly regarding travel vaccine safety (20%), malaria prophylaxis (17%), and other specific pre-travel issues as shown in [Figure 2]. In terms of post-travel advice, participants reported that provided consultation

for diarrhea (66.7%), fever (50%), and respiratory infection (43.3%) [Figure 3].

Knowledge scores

The number of correct responses was obtained from questions that aimed to assess knowledge about various vaccines in TM such as yellow fever vaccination, malaria prophylaxis, and meningococcal vaccination [Figure 4].

A score criterion was applied with 11 as the maximum score. The mean score obtained was 5.1 and the standard deviation was 2.7. The median score was found to be 5. The association of certain physicians' characteristics such as academic degree, clinical experience, practice level, pre-travel consultation, post-travel consultation experience, and attendance to TM continuing medical education programs (CME) with knowledge scores was examined [Table 3]. Fisher's test was used to examine the association where the null hypothesis states that there is no relationship between the specific

characteristics and knowledge scores. The significance level was set to 0.05. As per the *P*-values shown in Table 3, the following can be concluded, there is no relationship between clinical experience and knowledge score. It was found also that there is no relationship between consultation experience and knowledge score.

Table 2: Availability of vaccines, chemoprophylaxis, and resources in the health-care centers in Riyadh city

Resources, vaccines, and prophylaxis in health centers	n (%)
Availability of travel medicine clinics	
Yes	4 (16)
No	21 (84)
Access to resources (i.e. Internet, staff website) at the working site	
Yes	4 (16)
No	21 (84)
Availability of routine vaccines	
Meningitis	25 (100)
Influenza	25 (100)
Malaria prophylaxis	4 (16)
Rabies	15 (60)
Typhoid	4 (16)
Yellow fever	4 (16)
chickenpox	23 (92)
DTP	24 (96)
MMR	25 (100)
Polio	25 (100)
Shingles	14 (56)
Hepatitis A	25 (100)
Hepatitis B	25 (100)
Measles	25 (100)

Qualitative analysis

The participants were seven physicians assigned to TM clinics from four health centers in Riyadh city and were interviewed. Three important themes from the analysis of the participant's responses are outlined below:

Vaccine supply shortage

Vaccine shortages were a major theme in the analysis when it came to trying to understand the challenges encountered by physicians while working in TM clinics. Shortages of vaccines and malaria prophylaxis can have a severe impact on service uptake and act as a barrier to travel medical service uptake. Concerning vaccine shortages, some participants stated that: "Yellow fever, typhoid, and rabies vaccines are often not available, there is always a shortage."

"Malaria prophylaxis is available 20–30% only, and there is no flexibility, so the choice is."

Training

Out of seven participants, three attended CME from the Ministry of Health, and four doctors attended training in the health center organized by their colleagues. The physicians highlight the importance of training for travel-related diseases and travel vaccination. This was also echoed by a doctor who stated that: "Training courses should be prepared for health practitioners in TM clinics and vaccination clinics as well." "One day we faced difficulty in calculating the dose of polio vaccination due to the lack of adult visitors."

Awareness

Participants agree to raise awareness of the existence of a TM clinic among physicians and the community and provide the resources (i.e. brochures, flyers, and leaflets), and conduct awareness campaigns. One physician stated that the client: "Clients come for a yellow card without taking the vaccine, so it takes time to convince them of the importance of getting vaccinated" Another physician about the resource: "we cannot conduct any campaigns without resources." Two physicians mentioned less communication with the program and the rest of the TM doctors and differences in schedules and working days in TM clinics. One clinic operates daily in the health center, and the other two TM clinics work once a week. The fourth clinic stopped working a few months ago,

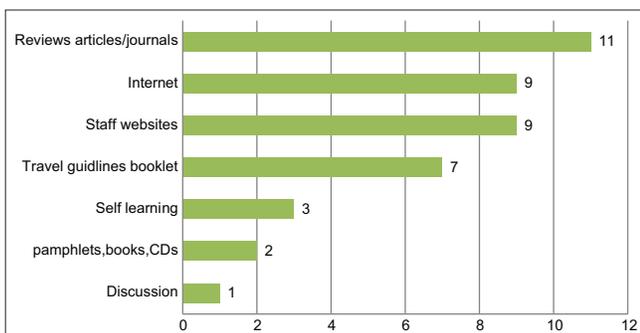


Figure 1: Sources of information among primary health-care physicians about travel medicine

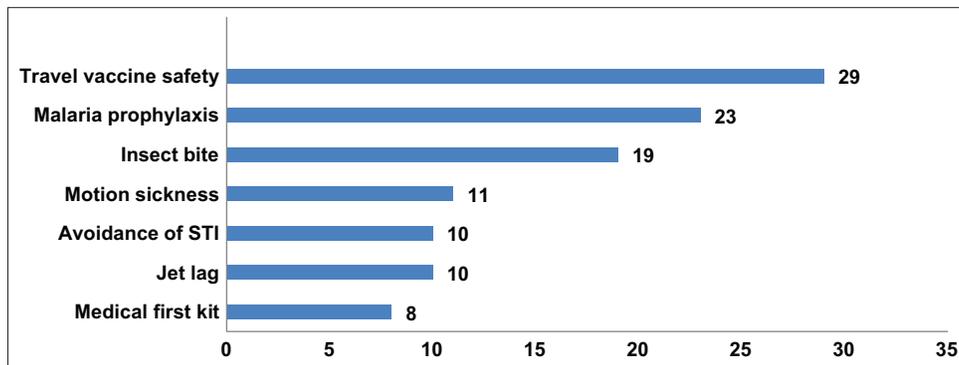


Figure 2: Percentage of participants addressing specific pre-travel consultation issues

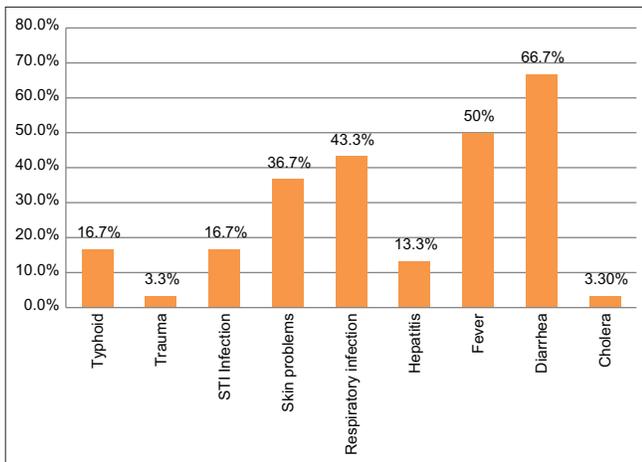


Figure 3: Percentage of post-travel presentations of travel-related illness reported to primary health care physicians at their health centers

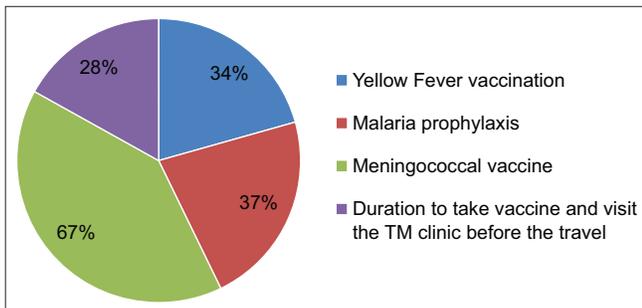


Figure 4: Knowledge level of physicians in primary health-care centers regarding diseases related to travel and duration to take vaccines

and clients were referred to another center due to shortages of vaccines and staff.

DISCUSSION

This was the first mixed methods study to evaluate TM clinic status and resource availability in PHC in Riyadh city, and Saudi Arabia. The results of the study showing many challenges in the TM clinic in health centers, and

these challenges may affect the service provided to travelers. A previous study was conducted in Riyadh but did not mention the barriers facing physicians, especially physicians assigned to TM clinics.^[3] Since TM and vaccination are recognized as advanced-level services on a global scale, official accreditation and evaluation are required to provide standardized levels of ability across all healthcare professions.^[12] The distribution and delivery of vaccines against diseases are an essential part of a TM service. Our study highlighted the availability of travel-related vaccines and sitting at the TM clinic. One of the four clinics for TM in Riyadh provides consultation, a nurse administers the vaccine, and a refrigerator to keep the vaccine all in one place inside the clinic and this is not the same structure in all other TM clinics. It makes sense to combine a vaccine clinic with a travel clinic because both offer the necessary vaccinations, have established processes, and facilitates the workflow within the travel clinic. The qualitative result shows that some vaccines are limited to TM clinics (i.e., yellow fever, typhoid, malaria prophylaxis), with a constant lack of availability. In such situations, supplement problems also become a barrier, it may affect the work of the TM clinic. A healthcare provider who offers pre-travel counseling should first be aware of the global epidemiological landscape of infectious diseases. Access to polish medical travel information sites, official WHO or CDC websites, or both is advised.^[13]

In the present study, sixteen percent had internet access at the worksite. In Qatar, 95% of physicians use internet information sources due to their accessibility and convenience. The majority of physicians had easy access to various informational resources, such as postgraduate medical centers and their libraries in Britain.^[14,15] For effective TM practice Access to current, applicable, and evidence-based resources is necessary for PCPs. In this study, the knowledge of PCP on yellow fever, meningococcal vaccines, and malaria chemoprophylaxis was assessed. Scoring criteria are applied to calculate knowledge scores. The overall mean knowledge score was 5.1. The findings in our study are consistent with earlier studies of PCP knowledge of TM. For example, in Oman, the participants' mean knowledge score was 7.1 out of 14 in the knowledge of TM.^[16] In another study in Qatar, that assessed the knowledge of PCPs about travel vaccines and

Table 3: Effect of level of clinical experience and training on assessed levels of knowledge of PCP

Physicians characteristics	Category	Score ≤5 (%)	Score >5 (%)	P-value
Academic degree	Graduate	12 (93)	1 (8)	0.009
	Postgraduate	6 (60)	4 (40)	
	Consultant	2 (29)	5 (71)	
Clinical experience	< 8 Years	12 (80)	3 (20)	0.245
	> 8 Years	8 (53)	7 (47)	
Practice level per month	<20consultations	19 (79)	5 (21)	0.002
	>20Consultations	0	5 (100)	
Consultation experience	Pre-travel	6 (50)	6 (50)	0.249
	post travel	2 (67)	1 (33)	
	both	12 (80)	3 (20)	
Participation in travel medicine CME	Yes	0	3 (100)	0.03
	No	20 (74)	7 (26)	

CME: Continuing medical education

malaria chemoprophylaxis the participants' mean knowledge score was 9.5 out of 16(8). In the present study, the Fishers test was used to examine the association between specific characteristics and knowledge scores. For instance, there is a relationship between academic degree and knowledge score where the majority of consultants (71%) scored above 5 while most graduates and postgraduates scored less than.^[13] This result supports the interview with the participant's suggestion by linking the academic degree and providing services to the clinic. Similarly, a study in the USA supports this finding.^[14] The quantitative analysis in our study showed that there is a relationship between practice level and knowledge score where the majority of those who have <20 consultations (79%) scored below 5 while all of those who have more than 20 consultations scored above 5. Therefore, more and more regular exposure to consultations and travel-related issues can lead to higher levels of information; looking for and acquiring new knowledge. TM training depends on many factors, including the scope of services offered, to determine at least how much training and how long should be considered. The ISTM body of knowledge emphasizes that a portion of training time should be devoted to developing the necessary abilities for pre-travel risk assessment.^[12] According to a recent study, the required minimum training for these criteria could range from a 2-day course for practitioners with some experience to 10-week (50-hour) modules for medical students.^[17] In the present study, 43% of physicians assigned to the M clinic attended TM updates (CME). Nearly 90% of PCPs and some participants at the TM Clinic reported that they had not received any formal training. The quantitative result showed practitioners assigned to TM clinics who attend CME were significantly more likely to have a higher knowledge score. Our findings are consistent with other research that compares those who attended TM training with other physicians in Qatar and USA. These results show the beneficial impact of MT training on the knowledge of PCPs in this field, which may enhance the quality of TM consultations. However, most primary care physicians specified the training requirements.

Postgraduate medical education programs must include more travel medical training. Most practitioners, if not all, are interested in TM, and most currently provide travel guidance. Support should be given in the form of TM education.

The qualitative analysis highlights importance of raising awareness among the healthcare providers and community. Lack of awareness leads to minimum utilization of TM services. Alghamdi *et al.* reported that adult Saudi travelers have major knowledge gaps related to the transmission and prevention of disease.^[18] In Oman, the study showed poor awareness in public lead to low travel in medicine-related consultation. Study in the us, one-third of respondents were unaware of the presence of travel specialists in their area, indicating either a lack of providers and public awareness or a lack of communication channels between PCPs and specialists.^[2] The qualitative result of our study mentioned the collaboration between the primary care physician and the travel medical practitioner is limited. Although the best solution could be a mandatory requirement to obtain a specialist certificate in TM, continuing education and training for other professional health services may still be necessary to meet the demand for TM services within areas where there are no certified TM specialists.

This study has several strengths. First study KSA to evaluate the TM clinic at PHC centers. One-on-one interviews with all physicians assigned to the TM clinic and discuss the barriers the physician faces in gaining knowledge and practicing TM. The limitation of this study was the sample size, which may not represent a complete picture of the status of TM services in KSA, but this sample provides an indication of the status of these services in the primary health-care sector.

TM clinic is limited to government institutions, which often do not provide advice to non-Saudis. However, pre-travel vaccines and malaria prophylaxis are only available in MOH institutions. This study does not reflect the situation of non-Saudi beneficiaries of the service.

CONCLUSION

The evaluation of TM clinics in PHC was found to missing links in communication between TM clinics and program providers that needed meetings and continuous training as well as the development of its plan to raise awareness among doctors and the community about the TM clinic. The qualitative and quantitative findings of this study provided information on the state of TM services provided in PHC facilities in the city of Riyadh, which may be considered a snapshot of the service available within the country.

REFERENCES

1. United Nations World Tourism Organization. Growth in International Tourist Arrivals Continues to Outpace the Economy. Spain: United Nations World Tourism Organization, 2020.
2. Kogelman L, Barnett ED, Chen LH, Quinn E, Yanni E, Wilson ME, *et al.* Knowledge, attitudes, and practices of US practitioners who provide pre-travel advice. *J Travel Med* 2014;21:104-14.
3. Sharahili AA, Eanzi FA, Ghzwany AA, Alazmi AM, Alhwsawi EA. Knowledge, attitude, and practice of travel medicine among primary health care physicians in Cluster 1, Riyadh City, Saudi Arabia: A cross-sectional study. *J Family Med Prim Care* 2021; 10:2587-93.
4. Samreen S, Sales I, Bawazeer G, Wajid S, Mahmoud MA, Aljohani MA. Assessment of beliefs, behaviors, and opinions about blood donation in Telangana, India-A cross sectional community-based study. *Front Public Health* 2021;9:785568.
5. Wajid S, Samreen S, Sales I, Bawazeer G, Mahmoud MA, Aljohani MA. What has changed in the behaviors of the public after the COVID-19 pandemic? A cross-sectional study from the Saudi community perspective. *Front Public Health* 2022;10:723229.
6. Syed W, Alharbi MK, Samarkandi OA, Alsadoun A, Al-Rawi MB, Iqbal A, *et al.* Evaluation of knowledge, awareness, and factors associated with diabetes: A cross-sectional community-based study. *Int J Endocrinol* 2022;2022:1921010.
7. Syed W, Alsadoun A, Bashatah AS, Al-Rawi MB, Siddiqui N. Assessment of the knowledge beliefs and associated factors among Saudi adults towards blood donation in Saudi Arabia. *Hematology* 2022;27:412-9.
8. Syed W, Samarkandi OA, Sadoun AA, Bashatah AS, Al-Rawi MB, Alharbi MK. Prevalence, beliefs, and the practice of the use of herbal and dietary supplements among adults in Saudi Arabia: An observational study. *Inquiry* 2022;59:469580221102202.
9. Syed W, Iqbal A, Siddiqui NA, Mothana RA, Noman O. Attitudes and associated demographic factors contributing towards the abuse of illicit drugs: A cross-sectional study from health care students in Saudi Arabia. *Medicina (Kaunas)* 2022;58:322.
10. Syed W, Samarkandi OA, Alsadoun A, Harbi MK, Al-Rawi MB. Evaluation of clinical knowledge and perceptions about the development of thyroid cancer-An observational study of healthcare undergraduates in Saudi Arabia. *Front Public Health* 2022;10:912424.
11. Syed WS, Bashatah A, Al-Rawi MB. Evaluation of knowledge of food-drug and alcohol-drug interactions among undergraduate students at King Saud university-an observational study. *J Multidiscip Healthcare* 2022;15:2623-33.
12. Evans D. Review of training and education standards applied to pharmacy based travel medicine services in the UK. *Travel Med Infect Dis* 2019;32:101497.
13. Korzeniewski K, Korzeniewski K. Travel medicine in primary health care. *Family Med Prim Care Rev* 2017;19:303-8.
14. Al-Dahshan A, Selim N, Al-Kubaisi N, Mahfoud Z, Kehyayan V. Primary care physicians' knowledge of travel vaccine and malaria chemoprophylaxis and associated predictors in Qatar. *PLoS One* 2022;17:e0265953.
15. Carroll B, Behrens RH, Crichton D. Primary health care needs for travel medicine training in Britain. *J Travel Med* 1998;5:3-6.
16. Kurup PJ, Al Abri SS, Al Ajmi F, Khamis HA, Singh J. Knowledge, attitude and practice of travel medicine among primary care physicians in Oman: The need for intervention. *EMHJ* 2019;25:40-6.
17. Travel Medicine Education-what are the Needs? Available from: <https://www.academic.oup.com/jtm/article/23/5/taw039/2579308> [Last accessed 2022 Dec 01].
18. Alghamdi AH, Ibrahim AM, Al-Ghamdi MS, Ryan ET, Al-Raddadi R. Travel health in the kingdom of Saudi Arabia: Perception and practice of Saudi travelers. *Int J Health Res Innov* 2014;2:25-39.

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