

A SYSTEMATIC REVIEW ON TRAVEL MEDICINE PRACTICE TO CONTROL TRANSMISSION OF COMMUNICABLE DISEASES

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ABSTRACT

Background: The number of international travelers is estimated at 900 million per year and is projected to reach 1.6 billion per year in 2020. Travel medicine is devoted to the health of travelers who visit foreign countries. It is an interdisciplinary specialty concerned not only with prevention of communicable diseases during travel but also with the personal safety of travelers and the avoidance of environmental risks. This study aimed to review systematically the travel medicine practice to control transmission of communicable diseases.

Subjects and Method: A systematic review was conducted by collecting several studies that examined travel medicine practice related to the spread of communicable disease. A total of 11 articles was selected for this study. The data were analyzed using narrative synthesis and a review of travel medicine practice.

Results: Travel medicine practice was related to effective anticipation of communicable diseases including pre-travel health advice service, guideline, vaccination, and post-trip care. These practices could not be underestimated because virus and disease could easily spread when the tourists were not fit and exhausted during the trip. It was necessary for tourists to anticipate the spread of disease by knowing certain disease in the country and to have them vaccinated before traveling.

Conclusion: Travel medicine practice has a significant impact on disease transmission anticipation among travellers/ tourists.

Keywords: travel medicine practice, communicable disease spread, tourists

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BACKGROUND

Travel medicine is a medical discipline that deals with prevention of infectious diseases during international travel as well as the personal safety of travelers and the avoidance of environmental risks during travel (Hill et al., 2006).

The travel medicine practices must be avoided the risk of infectious diseases during travel time. There are some infectious diseases that should be anticipated in some certain countries, such as measles, cholera, dengue fever,

yellow fever, meningitis, hepatitis A, hepatitis B, hepatitis C, and even HIV/AIDS, etc. To overcome these infectious diseases in certain countries, it is needed to vaccinate travelers corresponding to the travel destination country, for instance Japanese Encephalitis vaccination (JE) is a mandatory vaccination for travelers who will travel to Japan, Korea, Thailand; but for those who will travel to Indonesia, vaccination for this JE disease is not needed, since in Indonesia there is no JE virus or disease.

In addition to preventing health problems during the trip, travelers are encouraged to do counseling or get pre-travel advice from public health services that have the latest or up-to-date knowledge about diseases or viruses that are affecting certain countries, information about the environmental conditions and people lifestyles in destination countries, such as the sanitation in developing countries which are less concerned, a lot of garbage scattered on the roadside, unhealthy food or snacks that are offered to tourists, the cleanliness of toilets, etc.

Knowledge of environmental conditions and lifestyle of the community in destination countries is very important information for prospective traveler since the spread of viruses and diseases often caused by contamination and direct or indirect diseases transmission, the contaminated air, water, and food consumption can transmit bacteria and virus to people, it is in line with the statement of Division of Public Health, that the factors of transmitting diseases are through direct or indirect contact with new people or the community in the destination country, the examples of direct contact are touching, kissing, sexual contact, contact with oral secretions, or contact with body lesions, meanwhile the indirect contact infections diseases spread when an infected person sneezes or coughs, sending infectious droplets into the air, thus it is needed for the travelers to anticipate these causative factors by having any pieces of advice in pre-travel consultation and get vaccination. In addition, public health services working in the field of travel medicine should be expertise in considering the right

medicines to prevent or cope with the health problems of travelers.

Travelers should anticipate the infectious diseases spread during traveling to also anticipate post-travel serious illness and reduce the risk of death, thus it is needed for the travelers to do a pre-travel consultation or counselling to get some information regarding to health before doing a travel and get certain vaccination depending on the anticipation of diseases in the destination country, and these kinds of services belong to the travel medicine practices. Thus, the objective of this study is to review and investigate the effect of travel medicine practices in reducing the risk of health during traveling and its contribution to anticipate the infectious diseases spread. In this study, the researcher did not include the contribution of travel medicine practices to the non-infectious diseases, since the infectious diseases have higher impact on travelers' health risk during the trip.

SUBJECTS AND METHOD

1. Study Design

This was a systematic review conducted according to the guidelines and the statement Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA). Three databases included Science Direct, Elsevier, and PubMed was used to identify all both empirical and review studies. That articles published from 2004 to 2018. Keywords included (1) Travel medicine practices, (2) Travel clinic services, (3) Travellers' health risks, (4) Infectious diseases anticipation (5) Travel related illness.

2. Inclusive and Exclusive Criteria

The following key data were extracted (1) Types of infectious diseases that usually attack travelers during traveling, (2) types of anticipation regarding to

travel medicine services, (3) the level of success of travel medicine practices for travelers' health during the trip, (4) the key outcomes of travel medicine practices to reduce the health risk during traveling.

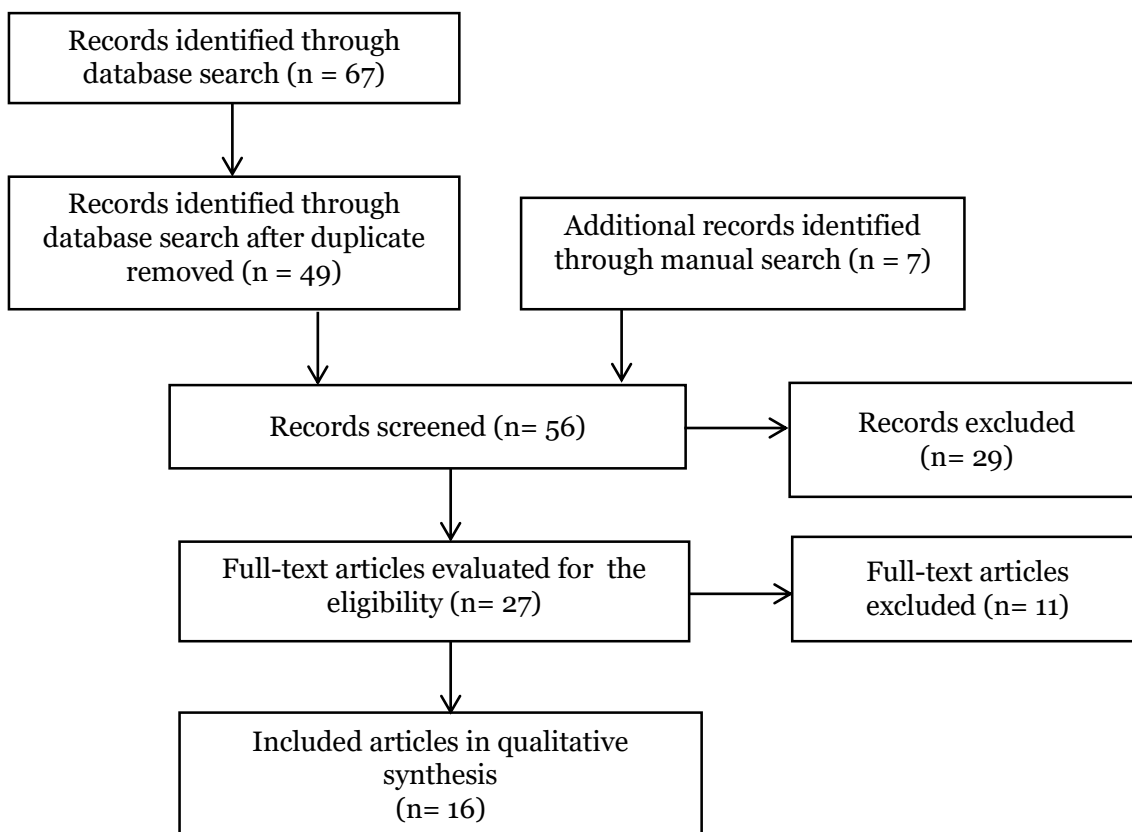


Figure 1. Flow diagram of Search Strategy

RESULTS

Table 1. Seven articles that are used in this study

Author	Travel Medicine Practices	Findings
Cornelisse et al., 2018	Concealing, vaccination and did contraceptives	The risk of Sexually Transmitted Infection (STIs) in some destination countries that have high rates of antimicrobial resistance (e.g. in Asian countries) can be managed by preparing for sexual safety prior to travel that can be provided by travel clinicians.
Aziz et al., 2018	Pre-travel consultation and immunizations for vaccine-preventable	60%, 46.3%, and 46.3% of Umrah pilgrims believed in importance of pre-travel vaccination, seeking health information, and health examination. The most frequently practiced pre-travel health-related behavior was getting vaccinated (56.3%), as compared to much

Author	Travel Medicine Practices	Findings
	diseases	lower frequencies of seeking health information (24%) or having a clinical health examination (26.7%).
Aba et al., 2018	Counseling and vaccination	Travelers who provided vaccination certificate were significantly younger than travelers who did not (mean age: 34.8 ± 17.8 vs. 46 ± 18.4 years, $P < 0.005$). Vaccine coverage against Tetanus, Diphtheria, and Poliomyelitis (Td/IPV vaccine) was 91.8%, 78.6% against Measles, Mumps, and Rubella (MMR), and 59.4% against Viral Hepatitis B (HBV). BCG vaccine coverage was 71.9%. Older travelers were less likely to be correctly vaccinated, except against HBV as vaccinated travelers were significantly older than unvaccinated travelers. Travel medicine consultations could be the opportunity to vaccinate against MMR, HBV, and Td/IPV.
Tan et al., 2018	Pre-travel consultation	The pre-travel consultation group had shorter hospital stays (mean 1.8 days for pre-travel versus 3.3 days for non-pre-travel consultation group, $p = 0.006$) and reduced gastroenterology consultation rates (OR 0.4; 95% CI 0.2 to 0.9). It means that the pre-travel consultation group have a shorter duration of hospitalization and reduced need for gastroenterology consultation for prolonged or severe symptoms, which are positive outcomes that reflect reduced morbidity of travelers' diarrhea.
Hoang et al., 2018	Vaccination	55% of pilgrims had an indication for pneumococcal vaccination. Respiratory symptoms, fever and antibiotic intake were significantly more frequent in pilgrims with indication for vaccination against pneumococcal infection. The prevalence of <i>S. pneumoniae</i> carriage (1.8% pre-, 9.8% post-Hajj), <i>H. influenzae</i> carriage (0.9%, 45.4%) and <i>K. pneumoniae</i> (2.8%, 9.8%) significantly increased post-Hajj. Pilgrims vaccinated with conjugate pneumococcal vaccine were seven-time less likely to present <i>S.pneumoniae</i> carriage post-Hajj compared to those not vaccinated (3.2% vs. 18.0%, OR= 0.15; 95% CI= 0.03 to 0.74; $p = 0.02$).
Yezli et al., 2018	Vaccination	There was no official policy for vaccination against pneumococcal disease for pilgrims attending Hajj and Umrah events. Pilgrims awareness to have pneumococcal vaccination for Hajj and Umrah was still low.
Bühler et al., 2017	Pre-travel consultation and measles vaccinations	There were more people who recognize the importance of travel medicine consultations enhance the measles vaccination coverage in the adult Swiss population. Measles vaccination that was given during pre-travel consultations provided at travel clinics, play a key role in measles elimination and can contribute to a higher coverage in their catchment areas while preventing the possibility of being a source of measles outbreaks abroad.

Author	Travel Medicine Practices	Findings
Wirawan (2016)	Pre-travel advice and vaccination	Some of the roles of travel medicine practices include; role in terms of providing information on whether or not a vaccination certificate is required, which is related to the legal aspects of visiting an area, the other role is in providing vaccination recommendations needed to prevent certain diseases, and also give pre-travel health advice.
Deshpande, et al., 2014	Vaccination	Clinicians were more likely to consider Japanese Encephalitis vaccine to not be indicated for the travelers of VFR (Visiting Friends and Relative) and travelers who visit India, because not all regions of India are the endemic for Japanese Encephalitis.
Sugitha and Wande, 2010	Pre-travel consultation, regular medication, close monitoring of the condition of the mother and fetus during the trip.	The increasing number of tourists traveling to the other countries will increase the risk of transmission of infectious diseases, one of them is malaria. One group that is susceptible to malaria infection in pregnant women. The travelers should have pre-travel counseling, especially for pregnant women who will travel to tropical countries in Asia.
Reviono, 2006	Health consultation and immunization	In terms of its relevance to avian influenza, tourism medicine plays a role in pre-tourism and post-tourism services. In addition, pre-travel consultation services, it is also important to provide health advice and counseling services, especially the advice relating to health problem and possible diseases infection when traveling.
Ross et al., 2006	Pre-travel advice on rabies and appropriate post-travel treatment	Almost all physicians and pharmacists in the study indicated that they would mention the risk of rabies and appropriate preventive measures to long-term travelers and tourists planning to visit rural areas. However, only 35% to 60% of the advisors would provide this information to individuals on business trips, package tours, or travelers in urban centers as well.
Leggat, 2005	Pre-travel health advice, chemoprophylax is against travel-related diseases, traveler's medical kits, Travel insurance, and post-travel assessments	Travel and aviation medicine have many linkages, especially in terms of fitness to fly and dealing with problems that may arise in travelers due to physiological and psychological stresses of travel. Travel medicine practices have great importance in travelers' planning. Travel insurance remains an important safety net for travelers, which provides coverage for medical and dental treatment abroad as well as an emergency assistance service.
Van Herck, et al., 2004	Concealing and vaccination	Recommended travel health advice help travelers that are visiting a high-risk area stay healthy while abroad and consequently to also reduce the potential importation of infectious diseases and the consequent public health and other implications.

Author	Travel Medicine Practices	Findings
Hamer, et al., 2004	Pra-travel concealing and vaccination	Travel medicine practices have raised people awareness on the traveling American public about the potential health risks associated with travel, the importance of safe and effective preventive measures, such as vaccines and malaria prophylaxis, and the importance of being well prepared in terms of health before travel.
Bacaner et al., 2004	Pre-travel health advice and vaccination	Pre-travel services ultimately lead to less morbidity and mortality; moreover, it is also lower acute care costs to the health care system. Since the immigrants who are regularly visiting friends and relatives (VFRs) will continue to be at high risk for travel-related illness, thus it is needed to have potentially serious personal and public health professionals who have a good knowledge and professionalism in travel medicine.

DISCUSSION

1. Types of travel medicine services

a. Pre-travel consultation

In the pre-travel consultation, the clinicians do not only investigate the accommodation, climate condition, hygiene and sanitation, yet they should also investigate the pre-existing illness of the travelers and control the travelers' unhealthy behavior. According to the statement stated in World Health Organization book in the discussion about International travel and health (WHO, 2012).

Pre-travel consultation should consider various aspects including; details of tourist trips, activities to be carried out during the tour, risky diseases that may be owned by tourists, immunization or vaccination history, availability of health facilities and medicines at the travel destination. It has been stated above that pre-travel consultation is very beneficial in preventing diseases due to travellers who have been given some information about diseases and the environmental

conditions of the community in the destination country. One of the most useful pre-travel consultation examples is the prevention of diarrhea, especially in the remote area as a travel destination. The most infectious diseases suffered by travelers when traveling are malaria, diarrhea, respiratory tract infection, hepatitis A, hepatitis B, measles and Japanese Encephalitis. However, diarrhea is one of the most infectious diseases that is often become a health problem for most travelers (Wirawan, 2016; Tan, et.al., 2010; Leggat, 2005).

b. Vaccination.

Travelers should also get preventative vaccinations for certain diseases existed in the tourist destination country. People in developing countries or remote areas commonly have a lack of hygiene awareness, moreover viruses and bacteria more easily develop and spread in a country with a tropical climate or more temperate climate (Bacaner et al., 2004; Hill et al., 2006; Brian et al., 2014; Tan et al., 2018; Cornelisse, 2018).

2. Factors impacting travelers' serious health risks during the trip

Factors impacting travelers' serious health risks during the trip included (1) The climate of destination countries; (2) duration and season of travel, purpose of travel; water quality and food hygiene; (3) The environmental sanitation in the destination countries; (4) Travelers' behavior and also; (5) Pre-existing illness of the travelers.

There are just a few people that are being aware to visit travel clinics to have pre-travel consultation and vaccination, while others do not have access to the travel clinics, especially in some developing countries. In some cases, people have a reason for not getting vaccinations for disease prevention before traveling or they consider that it is less necessary, they will go to psychiatric or hospital if they experience health problems or are seriously ill after traveling.

One of the examples in some cases that occurred in the Hajj and Umrah events, in which there are billions of people who came from all over the world, gathering together and worshipping in Mecca often contracted viral respiratory tract infections which were considered as normal condition by pilgrims during Hajj and Umrah events. Three current studies (Hoang, et al., 2018; Yezli, et al., 2018; and Aziz, et al., 2018) mentioned that pilgrims underestimate the importance of pre-travel consultation and vaccination to prevent the infectious diseases before having a trip or during the pilgrimage rituals. Many of the prospective pilgrims who carry out pilgrimage in Hajj and Umrah events

already known the risk of diseases that are often experienced by the former pilgrims who experienced the diseases (e.g. viral respiratory tract infections). There is just a small number of the pilgrims that are desired to get vaccine-preventable diseases in Hajj and Umrah events. In addition, some people do not like to be vaccinated since they believe that vaccination have several side effects (Aziz, et.al, 2018). Based on the empirical studies reviewed in this paper that were conducted in the periods of 3 months to over 10 years, almost all of them show that travel medicine practices have a significant impact on the anticipation of infectious diseases, especially in pre-travel consultation services and vaccination. Although few of them also mention that the clinicians or the travel medicine practitioners should improve their knowledge regarding the latest information about travel-related diseases, anticipation and treatment to also improve their services. A traveler's health and safety depend on a practitioner's level of expertise in providing pretravel counseling and vaccinations (Anari, et al., 2015). Further, it is also suggested to promote travel medicine services (Wirawan, 2016) to increase public awareness and understanding of the importance of having pre-travel health consultations and preventing the potential illnesses during a trip by taking preventive vaccinations.

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